



THE REPUBLIC OF SOUTH SUDAN MINISTRY OF ENERGY AND DAMS

SOUTH SUDAN ENERGY SECTOR ACCESS AND INSTITUTIONAL STRENGTHENING PROJECT (P178891)

ENVIRONMENTAL and SOCIAL MANAGEMENT FRAMEWORK (ESMF) (Revised)

JULY 2023

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TABLE OF CONTENTS

| | |
|---|-------------|
| TABLE OF CONTENTS | i |
| LIST OF TABLES | vi |
| LIST OF FIGURES | vi |
| LIST OF ACRONYMS | vii |
| EXECUTIVE SUMMARY | viii |
| 1 INTRODUCTION | 1 |
| 1.1 Background | 1 |
| 1.2 Scope and objectives of the ESMF | 1 |
| 1.3 Approach and Methodology | 2 |
| 1.3.1 Document review | 2 |
| 1.3.2 Stakeholder consultations | 2 |
| 1.3.3 Field Visits | 3 |
| 1.3.4 Lessons learned from other World Bank/Development Partner projects in South Sudan | 3 |
| 2 PROJECT DESCRIPTION | 4 |
| 2 Project Components | 4 |
| 2.1.1 Component 1: Juba grid Densification and Intensification | 4 |
| 2.1.2 Component 2: Pilot mini grids for rural electrification | 5 |
| 2.1.3 Component 3: Off-grid electrification of health facilities through standalone solar systems | 6 |
| 2.1.4 Component 4: Technical Assistance and capacity building | 7 |
| 2.2 Project Implementation Arrangements | 8 |
| 2.2.1 Project Beneficiaries | 8 |
| 2.2.2 Project Management Structure | 8 |
| 3 POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK OF SOUTH SUDAN | 10 |
| 3.1 Institutional Framework | 10 |
| 3.1.1 National Level | 10 |
| 3.2 National Policy and Legal Framework | 11 |
| 3.3 International Conventions and Legal Agreements | 17 |
| 3.4 World Bank ESS and Relevant Guidelines and Good Practices Notes | 22 |
| 3.4.1 Detailed assessment of the World Bank ESSs that are applicable to the Project | 22 |
| 3.5 Gap Analysis between the National Regulations and ESSs | 26 |
| 4.1 Physical Environment | 34 |
| 4.1.1 Geographical location of South Sudan | 34 |
| 4.1.2 Climate | 35 |
| 4.1.3 Landforms and Topography | 36 |
| 4.1.4 Soils | 36 |
| 4.1.5 Hydrology | 36 |

| | |
|--|------------|
| 4.1.6 Natural hazards and disasters | 36 |
| 4.2 Biological Environment | 37 |
| 4.2.1 Vegetation..... | 37 |
| 4.2.2 Fauna | 37 |
| 4.2.3 Ecology, Biodiversity, National Parks and Protected Areas..... | 37 |
| 4.3 Socioeconomic | 38 |
| 4.3.1 Population and economy | 38 |
| 4.3.3 Poverty and vulnerability | 39 |
| 4.3.4 Internally Displaced Person (IDPs) and Refugees | 39 |
| 4.3.5 Land uses and livelihoods | 40 |
| 4.3.6 Access to public services (electricity, communication, transport, health facilities, water and sanitation) | 40 |
| 4.3.8 Cultural Heritage..... | 43 |
| 5 PROCEDURE OF THE ESMF | 44 |
| 5.1 Overview of the Environmental Screening and Impact Assessment Process | 44 |
| 5.2 The Screening Process | 45 |
| 5.2.1 Step 1: Scoping/Screening | 45 |
| 5.2.2 Step 2: Assigning of Environmental and Social Risk Classification | 46 |
| 5.2.3 Step 3: Environmental and Social Assessment | 46 |
| 5.2.4 Step 4: Review and Approval..... | 47 |
| 5.2.5 Step 5: Public Consultations and information Disclosure | 47 |
| 5.2.6 Step 6: Monitoring, Supervision and Reporting..... | 47 |
| 5.2.7 Step 7: Annual Reviews | 48 |
| 6 ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES | 49 |
| 6.1 Impact Assessment Methodology | 49 |
| 6.1.1 Impact description | 49 |
| 6.1.2 Impact severity for planned activities | 49 |
| 6.1.3 Impacts of unplanned events (contingencies)..... | 49 |
| 6.1.4 Mitigation and residual significance..... | 50 |
| 6.2 Positive impacts of the project | 50 |
| 6.3 Negative Impacts & Mitigation Measures | 51 |
| 6.3.1 Adverse impacts of the Juba grid densification & extension | 52 |
| 4 Traffic Impact..... | 64 |
| 6.3.2 Adverse impacts of setting up mini-grids and off-grid Standalone solar systems | 73 |
| 7 ENVIRONMENTAL & SOCIAL MANAGEMENT AND MONITORING PLAN | 94 |
| 8 PUBLIC CONSULTATION, PARTICIPATION AND DISCLOSURE | 125 |
| 8.1 Stakeholder mapping (identification and analysis) | 125 |

| | |
|---|------------|
| 8.1.1 Stakeholder identification | 125 |
| 8.1.2 Stakeholder Mapping | 128 |
| 8.2 Stakeholder consultation during the preparation of the ESMF | 132 |
| 8.2.1 Phase 1: Preparation of the ESMF / Collection of E&S data..... | 132 |
| 8.2.2 Phase 2: Disclosure of the ESMF..... | 133 |
| 8.2.3 Phase 3: ESMF implementation stage | 133 |
| 8.3 COVID-19 protocol during stakeholder consultation activities..... | 134 |
| 9 GRIEVANCE REDRESS MECHANISM..... | 136 |
| 9.1. Grievance Channels | 136 |
| 9.2. Grievance Mechanism Procedure | 136 |
| Grievance Log | 139 |
| 9.3 GRM Value Chain..... | 139 |
| 9.4 GBV/SEA/SH-related Grievance | 139 |
| Step 4: Verify, Investigate and Act: The GRM Focal Point, will then undertake activity-related steps in a timely manner. The activities will include: verifying, investigating, redress action and plan. | 142 |
| 10 MONITORING AND EVALUATION | 145 |
| 10.1 Monitoring schedule and reporting obligations..... | 145 |
| 10.1.1 Monitoring during construction..... | 145 |
| 10.1.2 Monitoring during operation..... | 145 |
| 10.2 Monitoring and performance indicators | 145 |
| 11 PROJECT IMPLEMENTATION ARRANGEMENTS, RESPONSIBILITIES AND CAPACITY BUILDING | 147 |
| 11.1 Roles and responsibilities for the implementation of the ESMF | 147 |
| 11.2 Identification of capacity building needs | 148 |
| 11.3 Training program and tentative timelines | 149 |
| 11.3.1 Personnel from MoED, SSEC and other Government of South Sudan agencies..... | 149 |
| 11.3.2 Training of contractors, , supervising consultants | 150 |
| 11.3.3 Training of safeguards implementation staff | 151 |
| 11.4 ESMF Budget | 152 |
| REFERENCES..... | 154 |
| ANNEXES | 155 |
| 1. BACKGROUND | 222 |
| 1.1. CONTEXT | 222 |
| 1.2. PROJECT COMPONENTS..... | 223 |
| 1.3. ENVIRONMENTAL AND SOCIAL RISK RATINGS OF THE PROJECT | 225 |
| 1.4. THE ENERGY ACCESS PROJECT INFRASTRUCTURE INVESTMENTS / SUBPROJECTS | 226 |
| 2. OBJECTIVES OF THE CONSULTANCY SERVICE | 226 |
| 3. SCOPE OF WORK AND EXPECTED OUTPUT | 227 |

| | | |
|---|--|------------|
| 3.1. | GENERAL | 227 |
| 3.2. | INTRODUCTION | 227 |
| 3.3. | LEGAL AND INSTITUTIONAL FRAMEWORKS | 227 |
| 3.4. | PROJECT DESCRIPTION | 229 |
| 3.5. | ENVIRONMENTAL AND SOCIAL BASELINE CONDITIONS..... | 230 |
| 3.6. | ENVIRONMENTAL AND SOCIAL RISKS & IMPACTS | 231 |
| 3.7. | ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES..... | 233 |
| 3.8. | ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLANS | 233 |
| 3.9. | CAPACITY DEVELOPMENT AND TRAINING | 234 |
| 3.10. | IDENTIFYING AND ANALYSIS OF ALTERNATIVES | 234 |
| 3.11. | STAKEHOLDER IDENTIFICATION, CONSULTATIONS, AND GRIEVANCE REDRESS MECHANISM | 234 |
| 3.12. | CONCLUSIONS AND RECOMMENDATIONS | 235 |
| 4. | DELIVERABLES | 235 |
| 4.1.1. | Inception Report | 235 |
| 4.1.2. | Environmental and Social Impact Assessment (ESIA) Report | 235 |
| 5. | TIMELINE OF THE CONSULTANCY SERVICE | 236 |
| 6. | CONSULTANT’S TEAM AND QUALIFICATIONS..... | 236 |
| 7. | CONSULTANT’S PROPOSAL..... | 238 |
| 8. | CLIENT’S SUPPORT | 238 |
| 9. | ANNEX A : INDICATIVE OUTLINE FOR ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) REPORT | 239 |
| 1. | BACKGROUND | 241 |
| 2. | OBJECTIVES OF THE CONSULTANCY SERVICE | 242 |
| 3. | SCOPE OF WORK..... | 242 |
| 3.1. | GENERAL | 242 |
| 3.2. | INTRODUCTION | 243 |
| 3.3. | PROJECT DESCRIPTION | 243 |
| 3.4. | ENVIRONMENTAL & SOCIAL IMPACTS IDENTIFICATION & MITIGATION | 244 |
| 3.5. | MONITORING..... | 245 |
| 3.6. | CAPACITY DEVELOPMENT AND TRAINING | 246 |
| 3.7. | IMPLEMENTATION SCHEDULE AND COST ESTIMATE | 246 |
| 3.8. | INTEGRATION OF ESMP WITH THE PROJECT | 246 |
| 4. | DELIVERABLES | 246 |
| 5. | TIMELINE OF THE CONSULTANCY SERVICE | 246 |
| 6. | CONSULTANT’S TEAM AND QUALIFICATIONS..... | 247 |
| ANNEX I: ENVIRONMENTAL AND SOCIAL SCREENING FORM..... | | 157 |
| ANNEX II: GUIDANCE FOR SUBPROJECT RISK CATEGORIZATION..... | | 160 |

| | |
|--|------------|
| <u>ANNEX III: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) TEMPLATE.....</u> | <u>163</u> |
| <u>ANNEX IV: GRIEVANCE FORM.....</u> | <u>164</u> |
| <u>ANNEX V: GRIEVANCE LOG TEMPLATE.....</u> | <u>165</u> |
| <u>ANNEX VI: LETTER OF ACKNOWLEDGEMENT.....</u> | <u>166</u> |
| <u>ANNEX VII: ENVIRONMENTAL, EHS CLAUSES FOR CONSTRUCTION CONTRACTORS.....</u> | <u>167</u> |
| <u>ANNEX VIII: TEMPLATE FOR QUARTERLY AND ANNUAL ES PERFORMANCE REPORTS.....</u> | <u>170</u> |
| <u>ANNEX IX: CHANCE FINDS PROCEDURE.....</u> | <u>175</u> |
| <u>ANNEX X: SPECIFIC MEASURES AND COMMITMENTS TO BE UNDERTAKEN DURING PROJECT IMPLEMENTATION.....</u> | <u>181</u> |
| <u>ANNEX XI: TERMS OF REFERENCE (TOR) FOR PREPARATION OF AN ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA).....</u> | <u>192</u> |
| <u>ANNEX XII: TERMS OF REFERENCE (TOR) FOR PREPARATION OF AN ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP).....</u> | <u>218</u> |

LIST OF TABLES

| | |
|--|-------------------------------------|
| Table 3.1: National institutions in South Sudan and their relevance to the Project | Error! Bookmark not defined. |
| Table 0.2: National Policies and legal framework applicable to the Project | 13 |
| Table 3. 3: International Treaties, Conventions or Agreements relevant to the Project | 18 |
| Table 3.4: Other important international instruments relevant to the Project | 20 |
| Table 3.5: An analysis between South Sudan Laws and the World Bank ESS | 26 |
| Table 6.1: Determination of impact severity | 50 |
| Table 7.1: Summary of Environmental & Social Management Plan for Adverse impacts of the Juba grid densification & extension | 95 |
| Table 7.2: Adverse impacts of setting up mini-grids and off-grid Standalone solar systems | 110 |
| Table 8.1: Stakeholders identified during the ESMF preparation | 126 |
| Table 8.2: Assessing Stakeholder Interest | 128 |
| Table 8.3: Assessing Stakeholder Influence | 128 |
| Table 8.4: Stakeholder influence and project impact analysis matrix | 130 |
| Table 8.5: Phases of stakeholder Consultation during the preparation of the ESMF | 132 |
| Table 8.6: Methods and frequency of reporting to stakeholders during the ESMF implementation stage | 133 |
| Table 9.1: Grievance Categorisation and Response | 137 |
| Table 11.1: Roles and responsibilities for implementation of the ESMF | 147 |
| Table 11.2: Proposed Training format for ESMF implementation | 149 |
| Table 11.3: Awareness Raising and Training for Contractors, s and Supervision Consultants | 150 |
| Table 0.4: Tentative schedule for continuous training during construction and operation | 152 |
| Table 11.5: Budget Estimate for implementing the ESMF | Error! Bookmark not defined. |

LIST OF FIGURES

| | |
|--|-----|
| Figure 2.1: Juba Distribution Network and Planned Project Areas | 5 |
| Figure 2.2: Organogram of the proposed PSC and PIU | 9 |
| Figure 4.1: Location of South Sudan | 34 |
| Figure 4.2: Location of South Sudan's protected areas (Source: South Sudan Fifth National Report to the Convention on Biological Diversity) | 38 |
| Figure 9.1: Grievance Flow Chart | 138 |

LIST OF ACRONYMS

| | |
|---------|--|
| AfDB | African Development Bank |
| C-ESMPs | Contractor Environmental and Social Management Plans |
| CPA | Comprehensive Peace Agreement |
| DPs | Development Partners |
| DRC | Democratic Republic of the Congo |
| E&S | Environment and Social |
| EAPP | East Africa Power Pool |
| EHS | Environment Health and Safety |
| ESCP | Environmental and Social Commitment Plan |
| ESMAP | Energy Sector Management Assistance Programme |
| ESMF | Environmental and Social Management Framework |
| ESMS | Environmental and Social Management System |
| ESS | Environmental and Social Standards |
| GBV | Gender Based Violence |
| GHG | Green House Gases |
| GOSS | Government of South Sudan |
| IDP | Internally Displaced Persons |
| IFC | International Finance Corporation |
| JEDCO | Juba Electricity Distribution Company |
| LMP | Labour Management Procedure |
| MoED | Ministry of Energy and Dams |
| MoFP | Ministry of Finance and Planning |
| NGO | Non-Government Organisation |
| NDS | National Development Strategy |
| PHCCs | Payam-level Health Care Centers |
| PIU | Project Implementation Unit |
| SSEC | South Sudan Electricity Corporation |
| SEP | Stakeholder Engagement Plan |
| SPLM/A | Sudan People's Liberation Movement/Army |
| ToR | Terms of Reference |
| UN | United Nations |
| UNDP | United Nations Development Program |
| UNHCR | United Nations High Commissioner for Refugees |
| UNICEF | United Nations Children's Fund |
| WB | World Bank |

EXECUTIVE SUMMARY

The World Bank (WB) is providing financing to the Government of Republic of South Sudan (GoSS)¹ in the form of a US \$53 million grant to implement the South Sudan Energy Sector Access and Institutional Strengthening Project hereinafter referred to as “the project”. The project aims to increase access to electricity services and strengthen the institutional capacity of the energy sector in South Sudan.

The project will be structured around four components namely: Grid densification and extension in Juba, Pilot mini grids for rural electrification, Off-grid electrification through standalone solar systems, and Technical Assistance and capacity building in support of the afore-mentioned components among other aspects.

The development and implementation of the project and its related activities may be associated with environmental and social impacts that must be managed/mitigated so as to ensure that the positive impacts of the project are enhanced while the negative impacts are prevented or reduced to as Low as Reasonably Practicable.

As a result, this Environmental and Social Management Framework (ESMF) has been prepared under the coordination of South Sudan’s Ministry of Energy and Dams, to provide guidance regarding the management/mitigation of the impacts.

The preparation of the ESMF entailed undertaking a review of related documents to ascertain specific details of the project at hand and the associated South Sudan policy, legal, regulatory and institutional framework that is relevant to the project. Consultations with identified stakeholders in various government entities that are pertinent to the implementation of the project, and field visits that were undertaken to potential project host sites that included areas through which the Juba electricity grid is to be extended have been done. Field visits to, and within Juba were undertaken although these were restricted to Juba at the time. It is hoped that visits to areas outside Juba may be undertaken at a later date depending on the prevailing security situation within the country and the specific project areas.

When implemented, the project components will benefit; households and enterprises in Juba and Yei through Components 1 and 2, patients who use solarized health facilities, particularly in the Greater Upper Nile Region, populations in host communities and refugee communities in Juba, Yei and Greater Upper Nile Region. Sector institutions including Ministry of Energy and Dams (MoED) and South Sudan Electricity Cooperation (SSEC) will benefit from the strengthening of planning and implementation capacity through technical assistance and capacity building under component (4).

The ESMF highlights South Sudan’s policy, legal, regulatory and institutional framework governing environmental and social aspects of the proposed project. Also highlighted are international conventions and legal agreements that have been ratified by Republic of South Sudan and are relevant to the project. The World Bank’s Environmental and Social Standards (ESS) and their relevance to the project, is also discussed. It should be noted that only ESS9 (Financial Intermediaries) is not applicable to the project. A gap analysis between South Sudan’s laws and the World Bank ESS has been provided in the ESMF.

South Sudan’s environmental and social baseline is discussed and described in the ESMF. The baseline highlights the physical, biological and socioeconomic aspects that will have to be taken into consideration during the implementation of the project. Environmental and social screening will be undertaken following the steps highlighted in this ESMF, to determine the environmental and social aspects of subprojects on this project. In doing this, the environmental and social aspects of the subprojects will be ascertained as well as the type of environmental and social assessment that will be required in accordance with the ESS requirements. According to the current screening, the overall risk rating for the proposed project falls under the **High-risk** category. In particular, the following risks are considered high: (a) Political and Governance, (b) Institutional Capacity for Implementation and Sustainability, (c) Fiduciary, and (d) Environment and Social.

¹ Through the Ministry of Energy and Dams.

However, the screening process of individual proposed subprojects will inform decision makers and the project management of the real nature and extent of potential E&S risks and impacts that will arise because of subproject activities at the specific site location as well as biophysical & social setting. The procedure of ESMF encompasses seven processes, such as scoping/screening; assigning of environmental and social risk classification; environmental and social assessment; review and approval; public consultation and disclosure; monitoring, supervision and reporting; and annual reviews.

The ESMF establishes exclusion criteria for high-risk activities, which are not eligible for the project financing. High-risk activities are activities that may cause damage to cultural heritage; removal or conversion of forests and other natural resources, create encroachment and/or cause significant adverse impacts to critical natural habitats (e.g., wildlife reserves; parks or sanctuaries; protected areas; forests and forest reserves, wetlands, national parks or game reserve; any other ecologically/environmentally sensitive areas); serious adverse effects to human health and/or the environment; significant adverse social impacts and/ or may give rise to significant social conflict; drainage of wetlands and cultivation; significant land acquisition, forced eviction and involuntary physical displacement. It is also excluding activities that may potentially affect the quality or quantity of water or a waterway shared with other nations and affects the historically underserved and vulnerable groups.

The project is expected to have positive impacts such as; improvement of electricity access to project beneficiaries, improvements of the economic status of households and businesses through enhancement of small and medium enterprises, employment opportunities for local community members that will be engaged on project activities, reduced pressure on natural resources by communities who mostly utilise biomass to meet their energy needs that also include lighting, reversing the negative effects of climate change and environmental degradation through promotion of renewable energy, among others.

Similarly, the implementation of the project will result in a number of adverse environmental and social impacts that will include; increase in-migration into Juba from other parts of the country, pressure on existing social services and also result in poor sanitation due to poor waste disposal, spikes in crime rates etc.; a potential rise in prostitution that could lead to increased spread of sexually transmitted diseases and other communicable diseases, generation of hazardous and non-hazardous wastes, destruction of habitats during construction of access routes, excavation of pits where poles are to be erected and clearing the right of way for power transmission lines, among others.

However, in keeping with the impact mitigation hierarchy, measures will be implemented to avoid, minimise or manage the adverse impacts that could be associated with the project and its attendant components to ensure compliance with South Sudan's legal requirements and the World Bank ESF as well as enhance the benefits of the project.

It should be noted that stakeholder consultation and grievance redress/management will be ongoing throughout activities of the project and will be undertaken in all phases of the project.

Environmental and Social Monitoring of aspects on the project will be undertaken to provide for continuous assessment of compliance with the World Bank's ESF and the national requirements of South Sudan. This is in line with propagating continuous improvement on the project.

Regarding arrangements for implementation of the project, responsibilities and capacity building, human resources, logistical facilitation and linkages between government agencies will be required. The government will establish a Project Implementation Unit (PIU) that will assume the overall responsibility of implementing the project. Within the PIU, the MoED and SSEC will have responsibilities for steering the project and its implementation. Capacity building activities and programs will have to be undertaken to ensure that an excellent understanding of the inherent Environment and Social issues on the project is attained by all parties on the project and that these are well equipped to undertake their roles.

1 INTRODUCTION

1.1 Background

The Republic of South Sudan has one of the lowest energy access rates in Sub-Saharan Africa. It is estimated that only 7% of the population has access to electricity, most of which is concentrated in Juba, which has the country's only large-scale functional distribution network. While some cities used to be partially served by isolated grids, most of these were destroyed during the civil conflict and subsequent conflict and is largely non-operational. Many households and commercial and public institutions rely on diesel-powered generators, which are expensive to operate and require imported fuel and spare parts. Hence, South Sudan is unlikely to achieve universal access to affordable, reliable, sustainable, and modern energy under the Sustainable Development Goals 7 (SDG7) by 2030 in the absence of significant investment and scale-up of electrification activities.

In light of this state of affairs regarding energy access, the World Bank (WB) is providing financing to the Government of Republic of South Sudan (GoSS) in form of a US \$53 million grant to implement (*through the Ministry of Energy and Dams*), the South Sudan Energy Sector Access and Institutional Strengthening Project hereinafter referred to as "the project". The project aims to increase access to electricity services and strengthen the institutional capacity of the energy sector in South Sudan.

1.2 Scope and objectives of the ESMF

The ESMF is the instrument that is used to examine the E&S risks and impacts of a project when the subproject details or locations are not yet known. The main purpose of this Environmental and Social Management Framework (ESMF) is to set out the modalities for the environmental and social assessment of the project as well as the post assessment situation, as the specific aspects (*such as sites and the necessary subprojects regarding the implementation of components 1 - 4*) of the project become known during its implementation.

Moreover, it aims to provide guidance regarding the management/mitigation of environmental and social impacts that may be associated with the development and implementation of the project.

The broad objectives of the ESMF are to ensure that activities under the project:

- Enhance positive Environmental and Social outcomes; and
- Prevent or mitigate negative Environmental and Social impacts.

The specific objectives of the ESMF include:

- To establish clear procedures and methodologies for Environmental and Social planning, review, approval and implementation of the project;
- To provide guidance for the development of site-specific ESIs / ESMPs;
- To prescribe project implementation arrangements, responsibilities and the required capacity building for the preparation and implementation of the project;
- To assess the potential Environmental and Social impacts of the project;
- To propose mitigation measures which will effectively address identified negative impacts;
- To specify appropriate roles and responsibilities, and outline the necessary reporting procedures for managing and monitoring Environmental and Social concerns related to the project; and
- To determine the training, capacity building and technical assistance needed to successfully implement the provisions of the ESMF.
- To estimate the budget for implementing the ESMF.

1.3 Approach and Methodology

This ESMF was prepared under the coordination of the Ministry of Energy and Dams, and involved document reviews; stakeholder consultations; field visits to potential project host sites that included areas through which the Juba electricity grid is to be extended to; ESMF preparation meeting and a workshop; and lessons learned from projects financed by the World Bank in South Sudan as well as those of other Development partners such as the African Development Bank Group (AfDB). The various aspects of the approach and methodology are discussed further in Sections 2.2.1 and 2.2.2 below.

1.3.1 Document review

As part of the process of preparing the ESMF, a number of key documents were reviewed in order to ascertain the environmental and social baseline situation in South Sudan as pertains to the project coupled with the associated policy, legal, regulatory and institutional framework. Some of the key documents reviewed included:

1. South Sudan's first state of environment and outlook report, 2018.
2. United Nations Development Programme (UNDP) Annual Report 2021: Towards the South Sudan We Want.
3. Relevant national regulatory framework for the Government of Republic of South Sudan such as the Transitional Constitution of the Republic of South Sudan, 2011 and the Draft Environment Protection Bill, 2015.
4. The World Bank Environmental and Social Framework (ESF).
5. The International Finance Corporation (IFC) Performance Standards on Environment and Social Sustainability, 2012.
6. The World Bank Group General Environmental, Health and Safety (EHS) Guidelines, April 2007.
7. The World Bank Group Environmental, Health, and Safety Guidelines for Electric Power Transmission and Distribution, April 2007.
8. Core ILO Labor Standards and ILO Basic Terms and Conditions of Employment; and
9. Project Information Documents including the project concept note and the concept environmental and social review summary.

1.3.2 Stakeholder consultations

A number of key stakeholders were consulted in South Sudan, mainly in Juba, between 17th – 25th, October 2022. The consultations were guided by the stakeholder engagement plan that had been developed and which took into account the degree of influence/level in interest of the stakeholders as pertains to the project. Key among the stakeholders consulted included the following:

- Ministry of Public Service and Human Resource Development, represented by Under the Secretary.
- Ministry of Higher Education, Science and Technology, represented by the Director General in charge of World Bank funded projects.
- Donors in South Sudan whose interests are aligned with those of the project.
- Ministry of Energy and Dams represented the Under Secretary.
- South Sudan Electricity Corporation, represented by the Chairman.
- Ministry of Gender, Social Welfare and Religious Affairs, represented by the Under Secretary.
- Ministry of Labor, represented by the Under Secretary.
- Ministry of Health, represented by the undersecretary.
- Ministry of General Education and Instruction, represented by the undersecretary.
- Ministry of Environment and Forestry, represented by the Under Secretary.
- UNICEF; and
- Representatives of Media and Civil Society, among others.

1.3.3 Field Visits

Due to the prevailing security situation and safety/security advisories, field visits were only restricted to Juba although it's hoped that visits to areas outside Juba may be undertaken at a later date depending on the prevailing security situation. Visits were undertaken to the existing Juba electricity grid and those areas to which it might potentially be extended; an Internally Displaced Peoples (IDP) camp in Juba; an existing thermal power plant and a 20MW solar power plant. Information regarding the potential project host areas outside Juba was obtained from the various stakeholders that were consulted.

1.3.4 Lessons learned from other World Bank/Development Partner projects in South Sudan

The strategic environmental and social assessment (SESA) has identified gaps on various issues in the energy sector. The main findings were the institutional and legal framework which is in development and involves several stakeholders; the institutional capacities in the energy sector and natural resources sector are building; Republic of South Sudan (RSS) has limited policy and legislative framework for biodiversity conservation; the current emergency response capacity require to be consolidated; the biodiversity preservation is exposed to many pressures; there are issues of land use issues, movement of people into the RSS and Indigenous people; the development of energy sectors involves many environmental and social effects; the multiplication of sectors in a specific area will amplify some environmental and social effects and they have effects of development projects on wetlands, water resources and wildlife. Moreover, it is found that the Republic of South Sudan has limited access to energy (capacities for power supply, transmission, and distribution) and the energy sector development is also limited by the road system's current state. The RSS' economy relies heavily on oil production. The importance of creating employment is important. The quality of life and socio-sanitary conditions will be improved, notably by facilitating access to energy.

Lessons learned from the World Bank's previous interventions in the energy sector in Juba were used to inform the proposed environmental and social interventions of this ESMF. Of particular importance was the Electricity Sector Technical Assistance Project (ESTAP). Equally of importance is AfDB financing of Juba Power Distribution System Rehabilitation and Expansion Project² on whose interventions the proposed project is building upon. Equally of importance is the solarizing of Health facilities that has been undertaken by UNICEF in three (3) States of South Sudan.

It was noted in the AfDB financed Juba Power Distribution System Rehabilitation and expansion project that the South Sudan Electricity Corporation (SSEC) is a newly established entity and therefore lacks institutional capacity to implement, operate and maintain the distribution systems. As a result, the following would be a key in implementation of any energy related projects in South Sudan; if success is to be attained and project implementation delays avoided. There is a need to ensure knowledge building of SSEC and Ministry of Electricity and Dams (MoED) personnel by including specific provisions to ensure training of the personnel. The aspects of training of personnel, knowledge and technology transfer should be highlighted in the ESMF for the South Sudan Energy Sector Access and Institutional Strengthening Project so as to address the issue of capacity short comings in the entities.

² The Project was the first power project undertaken by the Bank in South Sudan.

2 PROJECT DESCRIPTION

2 Project Components

The project will be structured around four components as discussed below. The specific project works and locations will be ascertained at a later date. Whereas the detailed descriptions of the subprojects are yet to be ascertained at the time of preparation of this ESMF, it can be mentioned at this stage that some of the facilities which are expected to be associated with this project will include; the existing thermal power plant, the grid network that was established by the AfDB within Juba and the solar plant whose power is to be connected to the existing grid network.

2.1.1 Component 1: Juba grid Densification and Intensification

This component will finance additional grid connections to residential, commercial, and industrial customers in Juba and its vicinity through (i) service drop connections for new connection requests in the middle of the network and making use of the existing distribution infrastructure including 24 non-connected transformers already erected across the city (up to 20,000 connections) and (ii) expanding the MV and LV networks to the North, West and South-eastern parts of the city for additional 13,000 connections. These additional connections are expected to double the number of connections. The exact target areas for densification and expansion will be identified by the government through JEDCO and could also include communities in the periphery of Juba, such as Nesitu, Lokiliri, and Rajab based on the availability of funds. The component intervention will cover new connections within various site locations of Juba as depicted in Figure 2.1 and described below:

- Existing electrified area (border colour *blue*)- estimated number of new connections – 10,000.
- Existing 24 transformer area (border colour *magenta*)- estimated number of new connections – 10,000.
- Newly electrified area (border colour *cyan*)- estimated number of new connections – 13,000; and
- Large bulk supply customers (dispersed locations).

The project builds on a feasibility study supported by preceding intervention by the African Development Bank. The project activities will build up on the distribution network constructed to cover about 35% of the city with support by the AfDB (Phase I). The grant financing for this project is expected to lower the current high service connection cost to consumers. The client supported by JEDCO, the distribution company formed as PPP, worked with the Bank's team to define the scope of work and areas from perspectives of demand growth & utility's waiting lists and based on route selection and cost estimates of the feasibility study.

Investments under this component are also expected to reduce both power costs and connection costs to consumers. Increasing connections will ensure efficient utilization of current and planned generation facilities around Juba. By expanding the MV and LV networks, the grid's capacity will be enhanced to cater for power to be supplied from forthcoming generation assets, including the two 20 MW solar plants currently under construction. Twenty-five percent (25%) of the budget is allocated towards optimizing the backbone network for this purpose. The new investment will help injection of the new solar generated power to the grid. It is also expected to lower the cost of service and thus the consumer tariff. Currently, new customers are expected to pay minimum connection fees of US\$ 300 (single phase meters) and reach up to US\$ 600 (three phase meters) which is high and unaffordable. Moreover, the utility doesn't have a procedure for a uniform connection fee by end-users. During the AfDB project, users had been connected for free. Afterwards, new customers have been paying the total connection cost estimated by the grid operator. The project will also lower the currently high service connection cost to JEDCO consumers. Under the project, household consumers will be required to pay a nominal connection fee of 100 USD with the remaining cost covered by the project.

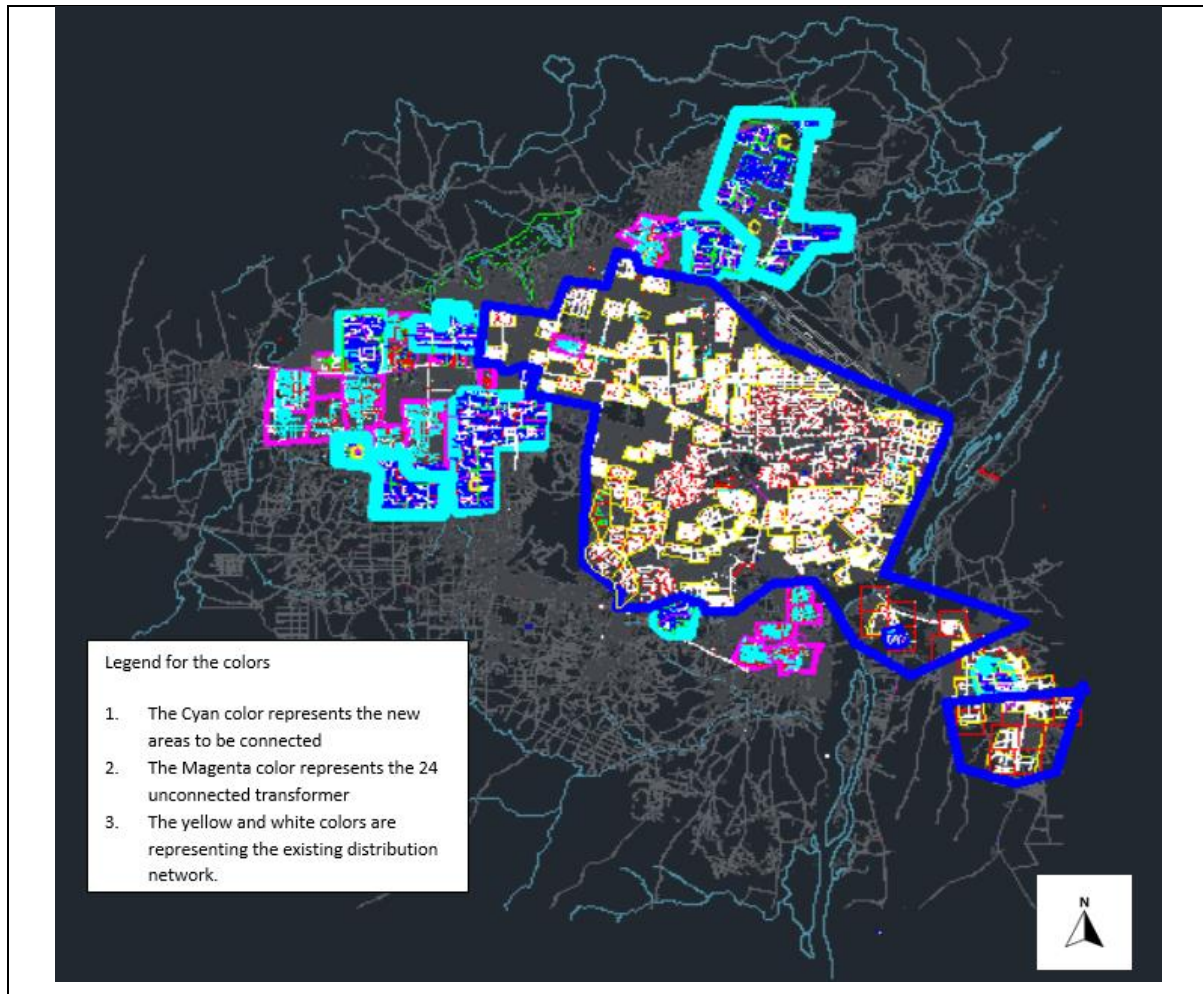


Figure 0.1: Juba Distribution Network and Planned Project Areas

Note: This figure for connection fees is not yet decided on, but under discussions.

2.1.2 Component 2: Pilot `mini grids for rural electrification

This component will support the hybridisation and rehabilitation of existing isolated grids with a solar hybrid with battery storage or a diesel backup in the town of Yei and selected South Sudanese communities. Based on high level geospatial analysis and survey activities in Yei town, it is tentatively considered that a solar PV system with a capacity of 5 MW, 12,000 kWh of batteries, and 3.4 MW capacity of a diesel backup will be implemented initially. This component is expected to electrify about 10,000 households, and 850 commercial and institutional customers.

Selection criteria. Yei is selected considering i) evidence for high electricity demand, including the demand for productive use; (ii) the existence of the generation and distribution assets that can be partially restored for usage; (iii) the MoED/SSEC's prior experience in the grid, iv) absence for other public players already investing for rehabilitation.

According to a survey and consultation with various potential anchor customers, sizable load demands including UN agencies, more than 30 NGOs, factories, and commercial customers are identified and further investigated through more thorough ground level survey. In 2008, Yei Electricity Cooperative Organization (YECO), which is a community-based organization, commissioned the grid operation with the support from USAID. While the grid operation has been halted since 2016, 1.2 MW capacity of diesel generators are still functional, but the grid network needs to be replaced and rehabilitated. Additional sites for the mini-grid development will be determined based on a more detailed site survey and design.

Service delivery model. The cost of the construction/rehabilitation of the generation and distribution capacity will be fully financed by grants to ensure the sustainability of investment. An EPC contractor will be selected competitively and responsible for building the generation and distribution capacity. Given the utility's lack of technical capacity and experiences in the operation, the private operators will be selected to operate the grid network and collect the revenue from customers directly. The revenue collected will address all O&M costs including overhead costs and the service fees to the private operator. (There is good technical capacity and experience within the SSEC team instead of costly private operators. Component 4 could be used to strengthen capacity in the Utility).

This project will also support the MoED to develop the capacity to formulate and deploy the contracts. Outside of Juba, the MoED has a very limited local presence and reach. Therefore, it is important to equip the government with the tools to provide market intelligence, manage the tender process, and monitor the progress of the project remotely and efficiently. Additional training will be offered to the government to better their understanding of the process of mini-grid development.

2.1.3 Component 3: Off-grid electrification of health facilities through standalone solar systems

This component will finance the delivery of solar and battery-based off-grid solutions for selected health institutions in rural areas, with priority on Payam-level hospitals (population of 25K and over), Health Care Centers (PHCCs). This includes 20-35 health institutions in the Upper Nile Region (Upper Nile, Jonglei, Unity, Ruweng Administrative Area, Pibor Administrative Area) with current Bank operation as well as other states identified as a result of further assessment in coordination with the Ministry of Health, which will be selected based on structural integrity of the buildings, level of service provided (availability of CEmONC - Comprehensive Emergency Obstetric and Newborn Care services, etc.), population coverage, pre-existing use of electricity and whether internal wiring is in place, etc.

The project will ensure proper level of coordination with the Ministry of Energy and Dams and Ministry of Health. It is foreseen that the MoED will contract the UNICEF for implementation of this component. UNICEF, supported by the ESMAP/World Bank, is currently implementing solarisation of 12 secondary health facilities which deliver CEmONC (comprehensive emergency obstetric and neonatal care) services in the states of Upper Nile and Jonglei, providing a 24-hour power to facilitate consistent access to essential services. Using the preliminary assessments done by UNICEF for an additional 187 health facilities, the team will conduct in-depth analysis to determine the beneficiary health institutions for the project.

One of the most important and critical aspects of the proposed activity is to ensure the sustainability of daily operation and maintenance of installed equipment. Considering the remoteness of the health facilities from main cities and the difficulty with transportation, especially during the flood season, it will be vital to arrange trainings for either the staff of the health facilities or members of the local community. This will not only ensure reliable electricity supply but will also allow engaging the local community in the process, resulting in an ownership and care feeling for the installed equipment which will result in decreased security threats and avoidance of theft and vandalism. In order to take care of minor renovations and ensuring smooth operation of the equipment, each facility will be provided with quick-fix spare parts, which the locally trained staff will be able to use. In case of a major breakdown, there will be a need for professionally trained specialists to visit the site, bringing the necessary major renovation parts.

In addition to the core electrification of health facilities, the intervention may provide a share of electric energy for productive use to local community. Since the majority of the health facilities usually have water supply wells, those will be considered as part of the projects, with a potential to share the water with the local community as well. This can also include battery/phone charging, agri-processing (e.g., mills), and cooling (e.g., refrigerators, milk chillers).

2.1.4 Component 4: Technical Assistance and capacity building

This component will provide technical assistance to MoED, SSEC, and other relevant institutions as necessary to develop the legal, regulatory, and institutional basis for sustainable sector growth and planning and mobilization of private sector investment both for on-grid and off-grid. The component will also provide funding to support project implementation and strengthen day-to-day institutional capacity and operations and will entail the subcomponents highlighted below.

Development of electricity sector legal and regulatory framework. This subcomponent will support enhancement and finalisation of the 2015 Electricity Bill, revisions to which have been delayed as result of inadequate resources and relevant expertise at MoED. The subcomponent will also support development of sector regulations, including a grid code, a tariff setting and design mechanism, and licensing and quality standards. This will include development of an PPP framework in the electricity sector to effectively attract and regulate private sector players, including for connection and dispatch of new generators to the Juba network and operation of isolated grids. Though MoED has made it a priority to establish an independent regulatory authority, development of regulations under this subcomponent will not be contingent on the establishment of such an authority and will also be implantable by MoED itself until a regulator has been established. The subcomponent will also review and revise, if necessary, the 2011 South Sudan Electricity Corporation Act – which established SSEC – and support preparation of business, HR, and incentive plans to better define the role and strategic direction of SSEC. Finally, this subcomponent will also support review and updating of 2013 National Electricity Policy and Strategy, which has increasingly been obsolete during the political and sector developments that have occurred in the decade since its publication.

Electricity Sector Planning. This subcomponent will support generation, transmission, distribution and electrification planning and development of planning capacity at MoED and SSEC. Rather than expend significant resources to develop ambitious, high-level, long-term plans in a volatile environment, plans prepared under this subcomponent will focus on the near- to medium-term and identify a small number of the most likely key scenarios, providing practical recommendations that MoED and SSEC will be able to implement immediately. These scenarios may include, for instance, a base case in which a growing number of isolated grids is eventually reinforced through a core transmission backbone and connected to other East African power systems, and an accelerated scenario in which private sector interests in oil or other key industries accelerate development of interconnectors and other infrastructure. Preparation of the plan will be sequenced to ensure that key strategic outputs are made available to the MoED and SSEC at an early stage. Emphasis will also be given to building in-house planning capacity at MoED and SSEC through modern digital planning tools and extensive training on their use.

As part of technical assistance on planning, the subcomponent will also finance initial analysis and design work for potential mini-grid sites not funded under Component 2 of this project in regional/State capitals, including Malakal, Aweil, Kwajok, Torit, and Bentiu Cities. For many potential mini-grid sites across the country, MoED and SSEC lack even basic information on the condition of existing infrastructure and the energy and infrastructure needs of those communities (e.g., city markets, as an anchor customer). This activity will therefore fund stocktaking of existing infrastructure and demand and energy consumption profiles, as well as preliminary mini-grids design to serve these communities in anticipation of future financing from the Bank, other development partners, or private investors.

Off-grid sector development. This subcomponent will target market development of the nascent South Sudanese off-grid solar sector, aiming to both existing South Sudanese businesses already active in off-grid distribution as well as incentivize increased market entry from more established international actors. Specific activities will include initial design work for a demand-side subsidy program, as affordability was identified by Bank-financed off-grid market assessment as the main constraint for households in adopting off-grid products; initial design work on a supply-side financing program, potentially including results-based financing (RBF) grants or concessional working capital loans; and development of the basic elements of off-grid regulation and public strategy, including definition of quality standards for systems and components and potential tax implications and exemptions for quality compliance.

Support for the Project Implementation Unit (PIU) and capacity building. This subcomponent will support the PIU to cover incremental costs of project management. This includes engagement of individual

consultants/consulting firms to support specific component activities as well as strengthening of MoED and SSEC capability in fiduciary, management, and environmental and social safeguards for project implementation. The sub-component will also include technical assistance to enhance sector fiduciary arrangements as well as setting up an E&S risk management system, enhancing the E&S capacity through staffing and training on the Environmental and Social Framework (ESF) requirements based on a robust capacity building plan.

2.2 Project Implementation Arrangements

2.2.1 Project Beneficiaries

The project will have groups of beneficiaries, each of them corresponding to different models of interventions. These include:

- Households and enterprises in Juba and Yei through Components 1 and 2. Approximately 210,000 people - 140,000 in Juba and 70,000 in Yei - will benefit from new or improved access to electricity services.
- Patients who use solarized health facilities, particularly in the Greater Upper Nile Region. The project will solarize roughly 50 hospitals, mainly, targeting state and county hospitals. About 1.2 million of population identified in catchment area will be benefited from the improved health services through solarisation efforts.
- Host communities and refugees. Population in host communities and refugee communities in Juba, Yei and Greater Upper Nile region will benefit from either improved access to electricity, solarized facilities as well as improved security through increased street lighting, and Sector institutions. In addition to the direct beneficiary households, the sector institutions including Ministry of Energy and Dams (MoED) and South Sudan Electricity Cooperation (SSEC) will benefit from the strengthening of planning and implementation capacity through technical assistance and capacity building under component 4.

2.2.2 Project Management Structure

The proposed structure of the PIU is summarised in figure 2.2 below. The MoED will be the implementing agency for all components of the project. Inside the MoED, a Project Implementation Unit (PIU) will be established to undertake day to day coordination and monitoring of implementation of all project components and cross-cutting activities. In addition to MoED staff, the PIU will include, secondees from the relevant entities including SECC, JEDCO, MoH and other relevant entities that will be assigned to support the implementation of the project. Under Component 3, the MoED will sign a standard agreement with UNICEF. The client will assign one gender focal person, one focal security person, one environmental specialist and one social specialist. Besides, the E&S focal persons shall also be hired and assigned to the beneficiary towns. If the third party will engage for monitoring the project, it will monitor the E&S aspects of the project.

The MoED will establish a project steering committee (PSC) to provide strategic guidance and overall oversight during project implementation and ensure effective coordination among all the stakeholders. The PSC will be chaired by the MoED Minister and include management representatives from MoFP and SSEC as the core members. The PSC will also include observer organization(s), including but not limited to, JEDCO, Ministry of Health, Ministry of Environment and Forests (MoEF), City Government of Juba, Yei County Government, UNICEF, UNHCR, Commission for Refugee Affairs (CAR), Government of Japan (as the PHRD donor), the World Bank, and other relevant stakeholders as needed. The PSC will review project progress at least once a quarter and provide guidance.

The UNHCR, UNICEF, and the World Bank will also play key roles in the implementation of the project. The project implementing entity/ PIU shall provide periodic environmental and social risk management performance reports to the Bank (including quarterly, and annual E&S performance reports).

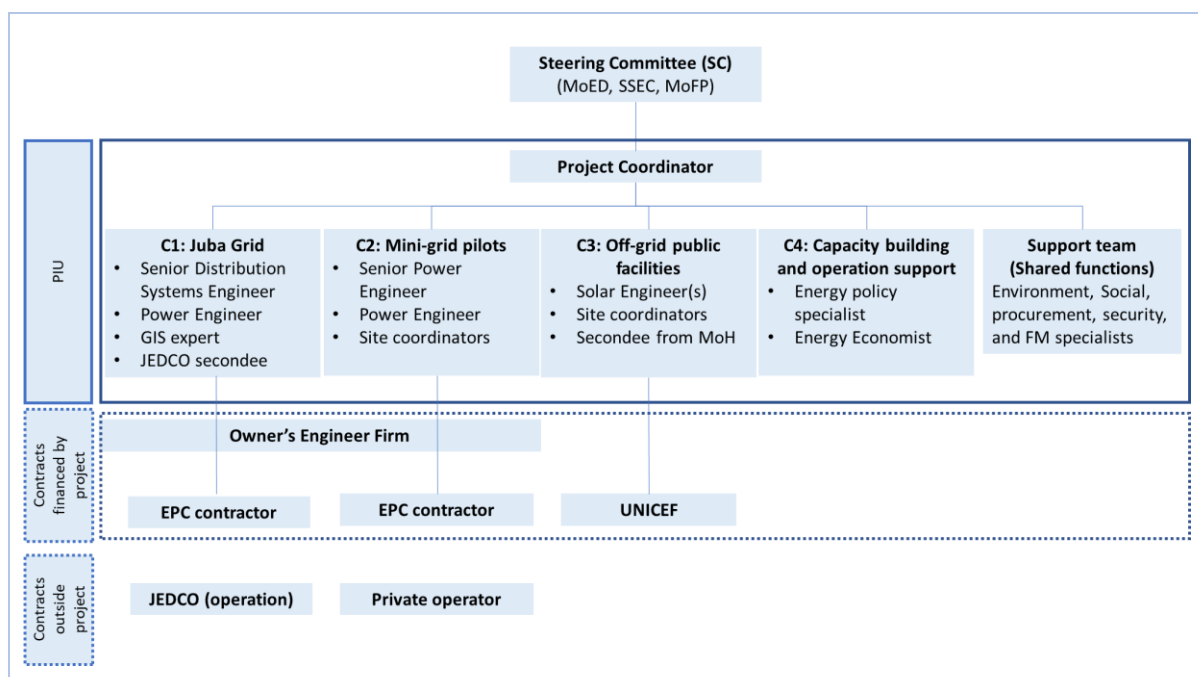


Figure 0.2: Organogram of the proposed PSC and PIU

3 POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK OF SOUTH SUDAN

3.1 Institutional Framework

The development of the proposed Project will require the coordination of national agencies assisted by lower-level sectoral departments. Non-Governmental Organisations will also contribute to the success of this project. Some of the relevant institutions will be key in the implementation of the proposed Project are as presented below.

3.1.1 National Level

Table 3.1 below, presents key national level agencies that are deemed to be of relevance to the implementation of the project.

Table 0.1: National institutions in South Sudan and their relevance to the Project

| Institution/Agency | Mandate and relevance to the proposed Project |
|--|---|
| Ministry of Energy and Dams (MoED) | The Ministry plans and provides power generation, transmission, and distribution facilities to industrial and domestic consumers through the South Sudan Electricity Corporation (SSEC). The MoED will be the main implementing agency of the project. |
| Ministry of Environment and Forestry | The Ministry is mandated with the Protection and conservation of the environment as well as ensuring sustainable utilisation of the environmental resource base to meet the needs of both the present and future generations. The ministry will be essential in providing oversight in implementation of environmental and social safeguards pertaining to the project. The MoEF will review and clear E&S screening report for relevant subprojects. Besides, subproject E&S instruments, such as ESMPs/ESIAs, will be reviewed and cleared by MoEF as a regulatory agency. |
| Directorate of Climate Change and Meteorology | The Directorate develops and implements programmes to address climate change issues and coordinates the implementation of South Sudan's obligations under the UN Framework Convention on Climate Change (UNFCCC) and the Convention on Biodiversity (CBD). The project will entail the development of renewable energy assets such as stand-alone solar systems that will mitigate the effects of climate change through the DE-carbonization of country's energy generation mix. The project should, therefore, remain cognizant of relevant Climate Change Action Plans to ensure that its activities are undertaken in tandem with the plans. |
| Ministry of Finance and Planning | The ministry allocates financial resources to government ministries and agencies, thus enabling them to implement government plans, policies, and programmes. The ministry will be essential in negotiating and administering/monitoring the grant funds earmarked for the project by the Work Bank. |
| Ministry of Health | The ministry is responsible for planning, delivering, and maintaining an efficient healthcare system. Since the project will entail providing health units with power, the Ministry is a key stakeholder in the project since the health facilities that will benefit from solarisation are under its jurisdiction. |
| Ministry of General Education and Instruction | The Ministry is responsible for primary and secondary education, as well as the training of educators in South Sudan. Education institutions have been earmarked as potential beneficiaries of solarisation by the project. Therefore, the ministry will be key in the monitoring the implementation of this aspect of the project within these institutions. |

| Institution/Agency | Mandate and relevance to the proposed Project |
|---|--|
| Ministry of Internal Affairs | The Ministry is responsible for ensuring and maintaining security and stability. It oversees agencies such as the police that will be key in the provision of security to the project personnel and assets. |
| Ministry of Humanitarian Affairs and Disaster Management | Its mandate is to oversee all humanitarian work in South Sudan. Therefore, the ministry will be key in decision-making on humanitarian related interventions that will be addressed by the project related interventions. |
| Ministry of Labor, Public Service and Human Resource Development | The mandate of the ministry includes regulation of the Private Sector labor market in a manner that is consistent with national priorities, values, and cost-effective service delivery. The ministry will ensure that the project's labor policies and guidelines are in line with its requirements and labor standards. |
| Ministry of Gender, Social Welfare and Religious Affairs | It is responsible for formulation and implementation of policies and legislations for promotion of gender equality, women's empowerment, child protection, social Protection and Social Welfare of the vulnerable groups in general welfare. As such, the ministry will ensure that gender equality and social justice are considered during the development of the project. |
| South Sudan Electricity Corporation (SSEC) | The SSEC is a government parastatal whose primary purpose is to generate electricity for use in South Sudan and for sale to neighboring countries. SSEC will be among the implementing bodies of the project. |

3.2 National Policy and Legal Framework

The policy, legal and regulatory framework governing environmental and social aspects of the proposed project for South Sudan are by and large updated, and with most of being revised to ensure that it is in tandem with similar frameworks in the East African Region and for which South Sudan is a member of the East African Community Region. For example, as part of the consultations held with the Ministry of Environment and Forestry pertaining to the afore-mentioned issue, the Undersecretary mentioned that a number of Acts/Regulations pertaining to environmental matters had been drafted and sent to the Ministry of Justice for review and it is hoped that these would be tabled before the council of ministers, and it is hoped the Environment Act can be passed within 6 months. It is worth noting that a committee for Environment and Forestry does exist at the parliamentary level.

Table 3.2 below outlines the respective Environment and Social legislation applicable to the Project.

It should be noted that prevailing policy, legal and regulatory framework in South Sudan categorised as follows:

- A. Post 2011 (post-independence) policies, laws and associated institutions established by the Government of the Republic of South Sudan;
- B. 2000-2011 (New Sudan) policies, laws associated institutions established by the Government of South Sudan (GOSS)³ and the Sudan People's Liberation Movement/Army (SPLM/A) administration; and
- C. Pre-2000 (pre-independence) policies, laws and associated institutions established while South Sudan was still part of Sudan, provided that they are not based on the Sharia law.

³ The GOSS was formed in 2005 with the signing of the Comprehensive Peace Agreement (CPA) that granted regional autonomy to Southern Sudan. Thus, before the enactment of the 2011 Constitution, the GOSS under the Interim Constitution of Southern Sudan 2005, governed Southern Sudan.

Table 0.2: National Policies and legal framework applicable to the Project

| National Policy/ Legal Framework | Description | Relevance to the Project |
|--|---|--|
| Environment Policy of South Sudan (2015 – 2025) | The Policy was passed in 2015 and its strategic goal is to ensure the protection, conservation and sustainable use of the natural resources of South Sudan without compromising the tenets of inter-generational equity. The policy will pursue and archive to develop laws, regulations and guidelines to ensure sustainable management of the environment as well as the prudent utilization of natural resources. The policy addresses a number of aspects that include; climate change, management of resources, corporate social and environmental responsibilities and environmental planning, among others. | <p>The project will entail activities such as civil works as part of construction of electricity infrastructure and creation of rights of way for electricity transmission infrastructure. Execution of these activities may involve vegetation clearance which should be undertaken in a sustainable manner.</p> <p>Additionally, the project will generate hazardous and non-hazardous waste during its respective phases that should be responsibly managed to avoid pollution of environmental media.</p> <p>The project will involve provision of support and capacity building to the Project Implementation Unit that will include strengthening the environmental and social safeguard implementation capacity at the Ministry of Energy and Dams as well as other project implementation entities/partners.</p> |
| Forest Policy, 2019 | The Forest Policy of South Sudan was launched in 2019. The Policy is broadly intended to protect the roles forests play in stabilising natural global systems including the hydrological balance, the carbon balance, atmospheric systems/cycles, etc. The policy broadly aims to achieve ecological stability of river systems, the lakes, swamps, agricultural production and other natural ecological systems. It is also meant to ensure that there are optimal benefits from forestry and agro-forestry activities for food security and poverty alleviation among rural communities through provision of woody and non-wood forest products. The policy integrates forest sector actions with rural development efforts to ensure that the rural population of South Sudan has access to basic needs which include; household food security, shelter, wood fuel, safe clean water, as well as sanitation and health facilities. | <p>Development of mini-grids outside Juba, especially greenfield sites, could affect sensitive ecosystems such as forests and swamps.</p> <p>-Activities that involve removal or conversion of forests and other natural resources, that may cause long term, permanent and/or irreversible loss of major forest habitats including habitats of wildlife and significant loss of biodiversity are not eligible for financing.</p> <p>.</p> |

| National Policy/ Legal Framework | Description | Relevance to the Project |
|---|--|---|
| The South Sudan National Gender Policy, 2012 | The goal of achieving gender equality in South Sudan is anchored in the country's Transitional Constitution and guided by a vision of equality as an inalienable right for all women, men and children, and gender equality as a human right. The ultimate goal of this policy is to ensure that gender equality is an integral part of all laws, policies, programs and activities of all South Sudan's public institutions, the private sector and civil society so as to achieve equality in the cultural, social, political and economic spheres in South Sudan. | Gender related concerns such as Gender Based Violence, sexual harassment, gender discrimination among others that may be associated with the development of the project should be addressed in line with the policy to ensure that the project objectives/desired benefits are attained. |
| South Sudan's Vision 2040 | The vision is aimed at ensuring equality, freedom, justice, peace and prosperity for all. The Revised National Development Strategy (R-NDS) for South Sudan, 2021 – 2024, is the main vehicle being used to pursue aspects of the vision. | The building of critical infrastructure for sustainable development, that includes energy, is cited among the key objectives that the R-NDS has to deliver as part of South Sudan's vision 2040 aspirations. The proposed Project and its socio-economic transformation aspects ties in with this aspiration. |
| The Transitional Constitution of the Republic of South Sudan, 2011 | The Transitional Constitution of the Republic of South Sudan came into force in 2011. It commits all levels of government in the Republic of South Sudan to sustainable development so as to ensure that the environment is protected for the benefit of both present and future generations, through reasonable legislative action and other measures. Article 41 (1) provides that the people of South Sudan shall have a right to a clean and healthy environment; (2) every person shall have the obligation to protect the environment for the benefit of present and future generations. Article 166 (6) mandates local governments to involve communities in decision making regarding the promotion of a safe and healthy environment. | The project's construction, operation and decommissioning activities are associated with both positive and negative environmental and social impacts and will therefore need to be undertaken in a manner that: <ul style="list-style-type: none"> a) Promotes sustainable development; and Protects the right to a clean and healthy environment for communities and persons in the project host area(s). |

| National Policy/ Legal Framework | Description | Relevance to the Project |
|--|--|--|
| The Draft Environment Protection Bill, 2015 | <p>This legislation aims to protect the Environment in South Sudan and to promote ecologically sustainable development that improves the quality of life. It grants the right to a decent environment to every person and the attendant right to bring an action to enforce that right if it is threatened as a result of an activity or an omission.</p> <p>It empowers the Ministry of Environment and Forestry to supervise and co-ordinate all matters relating to the environment and to be the principal instrument of government in the implementation of all policies relating to the environment.</p> | <p>The Bill is key to addressing pollution prevention, control and waste management since activities associated with the implementation of the project will generate waste.</p> <p>It is the duty of the Ministry of Environment and Forestry to oversee aspects related to protection of the environment in which the project is being undertaken.</p> |
| National Electricity Bill, 2015 | <p>The Bill provides for the regulation of generation, transmission, distribution, export, and import of electricity in South Sudan. The Bill provides for the power of a licensee (or a project developer) and transmissions (Section 33).</p> <p>The Bill also provides for the establishment of the Electricity Regulatory Authority which as part of its core responsibilities, is supposed to monitor the performance and compliance with the law and licence conditions, and the functioning of regulated entities of the electricity supply industry.</p> | <p>The project will be implemented in accordance with this bill since it will involve the generation, transmission and distribution of electricity.</p> |
| The Land Act, 2009 | <p>One of the key objectives of the Land Act is to promote a land management system that protects and preserves the environment and ecology for the sustainable development of South Sudan. It also provides for fair and prompt compensation to any person whose right of occupancy, ownership or recognised long standing occupancy of customary use of land is revoked or otherwise interfered with by the Government.</p> <p>The Act requires that state authorities approve land acquisitions above 250 feddans (105 hectares) and create a regulated ceiling on land allocations. The Land Act requires that the government consults local communities and consider their views in decisions about community land.</p> | <p>Whereas the project is not expected to require significant land acquisition and resettlement, some activities under component 1 such as isolated grids development and densification along with their low-voltage distribution networks may require some private.</p> <p>The project should seek to fairly and promptly compensate persons/communities whose land will be earmarked to host project components/activities. Additionally, during the implementation of the project, local communities (affected communities) must be adequately consulted.</p> |
| The Labour Act, 2017 | <p>The purpose of this Act is to establish a legal framework for the minimum conditions of employment, labour relations, labour institutions, dispute</p> | <p>A number of people will be employed as a result of the implementation of the project; therefore health, safety,</p> |

| National Policy/ Legal Framework | Description | Relevance to the Project |
|---|---|--|
| | resolution and provision for health and safety at the workplace; in accordance with the Constitution of the Republic of South Sudan, 2011, and in conformity with international and regional obligations of South Sudan. | welfare, age of employment and appropriate training of persons employed in workplaces should be considered. |
| Local Government Act, 2009 | The Act provides for establishment of powers, structure and functions of local governments. It defines the decentralised structure of the government administration. It also contains provisions for land administration and management in accordance with the Land Act and defines roles and responsibilities of traditional authority councils in the dispute resolution process. It also gives wide-ranging powers to Local Government councils to perform functions aimed at improving community livelihoods. | Implementation of the project must conform with the respective ordinances and by-laws of the local governments within projects area of influence. |
| The Environmental Protection Act, 2001 | <p>This legislation was in force before South Sudan gained her independence. The Act is not legally binding in South Sudan although it remains an important piece of legislation that is used to give guidance in ensuring environmental conservation in the country.</p> <p>Its principal objectives are: (i) To protect the environment in its holistic definition for the realisation of sustainable development; (ii) To improve the environment while ensuring sustainable exploitation of natural resources; (iii) To create a link between environmental and developmental issues, and to empower concerned national authorities and organs to assume an effective role in environmental protection. Section III of the Act outlines general policies and principles regarding the protection of the environment.</p> <p>Article 17 of the Act required that any individual who intends to implement any project that was likely to have a negative impact on the environment, should present an Environmental Impact Assessment (EIA) for approval by the Monitoring and Evaluation Committee of the Higher Commission for Environment and Natural Resources (HCENR) of the then Federal Government of Sudan.</p> | Environmental and Social impacts of the respective sub-projects of the Project should be addressed in a proactive manner by subjecting the respective projects to environmental and assessments prior to their commencement. |

| National Policy/ Legal Framework | Description | Relevance to the Project |
|---|--|--|
| Forests and Renewable Natural Resources Act, 2002 | <p>This is another Act that is no longer legally binding but whose principles remain useful in guiding the management of forest resources in South Sudan. The 2002 Act attempts to follow a more holistic approach by providing a framework for the management and protection of forests and renewable natural resources, including pastures, rangelands and certain aspects of agricultural land use.</p> <p>The Act imposes a deterrent penalty, namely the confiscation of any property, including the means of transport used in the commission of a forestry offence.</p> | There is need to safeguard natural resources such as trees during project implementation especially as they are likely to be cleared due to their potential shading effect on solarisation projects. |
| South Sudan Access to Information Act No. 65 of 2013 | The South Sudan Access to Information Act No. 65 of 2013 spells out that every citizen shall have the right of access to information. It focuses on the right to access information held by public bodies in South Sudan. The purpose of the Act is to give effect to the constitutional right of access to information, promote maximum disclosure of information in the public interest and establish effective mechanisms to secure that right. | This emphasises the need to disseminate project information to all the respective stakeholders and which go a long way in ensuring transparency on various aspect of the project. |

3.3 International Conventions and Legal Agreements

In addition to compliance with regulatory requirements, the Project will also adhere to the international conventions ratified by South Sudan. Key conventions and treaties potentially relevant to the Project are outlined in Table 3.4. Other important international instruments relevant to the Project are also outlined in Table 3.5.

Table 0.3: International Treaties, Conventions or Agreements relevant to the Project

| Treaty, Convention, Agreement | Requirement of the Treaty, Convention, and Agreement | Ratification | Relevance to the Project |
|---|--|--------------------------------|--|
| United Nations Framework Convention on Climate Change 1992 | Under Article 3 (3) parties are required to take precautionary measures to anticipate, prevent or minimise the causes of climate change and mitigate its adverse effects. | 17 th February 2014 | Given the fossil fuel heavy nature of South Sudan's energy mix, the solarisation aspect of the project will help to reduce the energy generation related emissions and thus contributing to the country's Greenhouse Gas reduction ambitions as set out in the country's second Nationally Determined Contributions (NDC) report. In the second NDC, South Sudan has significantly increased its climate ambition of reducing emissions across its sectors by 109.87 million tonnes of carbon dioxide equivalent while sequestering an additional 45.06 million tonnes by 2030. This among other things is designed to ensure that South Sudan adopts a sustainable and low-carbon growth pathway while also supporting the country's vision to 'transition from a least developed country to a middle-income country by 2030. |
| Paris Agreement | Its goal is to limit global warming to well below 2 degrees Celsius, preferably to 1.5 degrees Celsius, compared to pre-industrial levels. To achieve this long-term temperature goal, countries aim to reach global peaking of greenhouse gas emissions as soon as possible to achieve a climate neutral world by mid-century. | 23 th February 2021 | |
| Bamako Convention, 1991 | Requires party states to use legal, administrative and other measures to prevent the import of hazardous waste into Africa from non-contracting parties. All signatories to the Convention are required to impose strict, unlimited liability as well as joint and several liabilities on hazardous waste generators; ensure that environmentally sound treatment and disposal facilities for hazardous wastes are located, to the extent possible, within its jurisdiction; and ensure that persons managing hazardous wastes take all actions necessary to prevent pollution arising from the management of such wastes. | 24 th January 2013 | Hazardous waste generated during the implementation of the proposed Project and therefore there is need for compliance with the requirements of this Convention. |
| Conservation of Nature and | The convention aims at enhancing environmental protection, conservation and sustainable use of natural resources. The convention further identifies | 24 th January 2013 | Project planning should ensure that the project takes appropriate measures to minimise potential impacts on biodiversity by putting in place measures to control siltation of water bodies and |

| Treaty, Convention, Agreement | Requirement of the Treaty, Convention, and Agreement | Ratification | Relevance to the Project |
|--|---|--------------------------------|---|
| Natural Resources, 2003 | water as a critical resource which needs to be maintained at quantitative and qualitative levels. | | wetlands, disorientation of migrating birds and hunting/illegal exploitation of wildlife resources by contracted teams. |
| Convention for the Safeguarding of the Intangible Cultural Heritage, 2003 | The objectives include to: safeguard the intangible cultural heritage, ensure respect for the intangible cultural heritage of the communities, groups and individuals concerned and raise awareness at the local, national and international levels regarding the importance of the intangible cultural heritage, and of ensuring mutual appreciation thereof. | 23rd October 2017 | The people of South Sudan have a number of customs and beliefs that may entail tangible and intangible cultural heritage. Additionally, there could be graves/burial areas in sites that are earmarked to host project components. The implementation of the project should consider the potential impact on cultural heritage in the project area and implement measures to safeguard them where they exist. |
| Convention on Biological Diversity, (1992) | Its objectives are to conserve biological diversity, promote the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and technologies, and by appropriate funding (Article 1). | 17 th February 2014 | South Sudan has a lot of biodiversity and Wildlife outside protected areas. Project planning should ensure that the project takes appropriate measures to minimise potential impacts on biodiversity and key habitats that may occur in areas earmarked to host project components. |
| International Labour Organisation's Fundamental Conventions | Labour, working conditions, health and safety are the subject of numerous international agreements, conventions, policies and standards. Fundamental labour standards formulated by the International Labour Organisation (ILO) include forced labour, child labour and workmen's compensation among others. | 2012 | Labour policies for the Project and impact mitigation measures for employment should be in accordance with the requirements of these Conventions. |
| Ramsar Convention, 1971 | The Convention is an international treaty for the conservation and sustainable utilisation of wetlands, recognizing the fundamental ecological functions of wetlands and their economic, cultural, scientific and recreational value. | 10 th October 2013 | South Sudan currently has one (Sudd wetlands) site designated as a Wetland of International Importance. This wetland should be conserved during the development of the project. |

| Treaty, Convention, Agreement | Requirement of the Treaty, Convention, and Agreement | Ratification | Relevance to the Project |
|---|---|-------------------------------|--|
| Vienna Convention on the Protection of the Ozone Layer, 1985 | Parties should take appropriate measures to protect human health and the environment against adverse effects resulting or likely to result from destruction of the Ozone layer. | 12 th January 2012 | The Proposed Project should undertake measures to minimise emissions that deplete the Ozone layer by locally sourcing for materials that are required for the project to avoid long overland transportation of imported materials. |
| Convention on the Rights of the Child (1989) | The Convention is the most comprehensive compilation of international legal standards for the protection of the human rights of children. It acknowledges children as individuals with rights and responsibilities according to their age and development, as well as members of a family or community. | 23rd January 2015 | Activities associated with the development of project such as construction activities will require semi-skilled and unskilled labour that pose a potential risk of engaging child labour. |
| The Treaty of the East African Community, (1999) | Articles 111 and 112 of the EAC Treaty provide for conservation and management of environmental and natural resources. They require member states to take measures to control trans-boundary air, land and water pollution arising from development activities and take necessary disaster preparedness, management, protection and mitigation measures especially for the control of natural and man-made disasters. | 15 th April 2016 | River Nile is a transboundary water resource shared between Uganda and South Sudan; therefore, measures should be undertaken to minimise/prevent pollution of surface water resources within the Nile Basin during the development of the project. |

Table 0.4: Other important international instruments relevant to the Project

| Title | Description | Relevance to the Project |
|-----------------------------|---|--|
| Africa Agenda 2063 | This is Africa's transformation plan over the next 50 years and sets out a number of aspirations that are to be realised during that period. The agenda has since been adopted by the African Union (AU). | The agenda promotes the development of infrastructure which is in tandem with proposed Project. The project will lead to the development of electricity infrastructure in South Sudan. |
| The 2030 Sustainable | The SDGs were formally adopted by South Sudan and other member states in September 2015 as an integral part of the 2030 Agenda on | Development of the proposed project should comply with SDG 9 (Resilient infrastructure, sustainable industrialisation and |

| | | |
|---------------------------------|--|--|
| Development Goals (SDGs) | Sustainable Development. SDG indicators and targets are to be integrated in the appropriate Sector and Local Government Plans and budgets coupled with implementation, monitoring and evaluation frameworks. | innovation). Additionally, this project will lead to economic growth of South Sudan and contribute to reduction of poverty levels; SDG 1 (No poverty), improve health centres which benefits the realisation of SDG 3 (Good health and wellbeing), contribute to powering educational facilities which benefits SDG 4 (Quality Education), and provide renewable energy to remote areas – this contributes to achievement of SDG 7 (affordable and clean energy) |
|---------------------------------|--|--|

3.4 World Bank ESS and Relevant Guidelines and Good Practices Notes

The World Bank's Environmental and Social Standards (ESS) are designed to help ensure that programs proposed for Bank financing are environmentally and socially sustainable, and thus facilitate informed decision-making. Their relevance to the proposed Project is discussed in section 3.4.1.

3.4.1 Detailed assessment of the World Bank ESSs that are applicable to the Project

ESS1: Assessment and Management of Environmental and Social Risks and Impacts

This standard sets out the client's responsibilities for assessing, managing, and monitoring environmental and social risks and impacts associated with each stage of a project supported by the Bank through Investment Project Financing, in order to achieve environmental and social outcomes consistent with the Environmental and Social Standards. The environmental and social assessment will be based on literature review, field site visits and stakeholder consultations and any associated aspects at an appropriate level of detail sufficient to inform characterisation and identification of risks and impacts and mitigation measures. The assessment will evaluate the project's potential environmental and social risks and impacts including stakeholder engagement as an integral part of the assessment.

An assessment of the Environmental and social risks and impacts of the project throughout the project life cycle will be conducted in a systematic manner, proportionate to the nature and scale of the project and the potential risks and impacts. There are different categories of vulnerable groups in South Sudan. The conflict and subsequent displacement leaves children and other vulnerable groups such as females, women headed households, refugees, people living with disabilities, and the elderly at great risk. There are also vulnerable groups including people from low socio-economic background and divorced women, and youths. Particularly, children have become separated from their families when fleeing the violence leaving them unprotected from abuse, exploitation, and neglect. The vulnerability of these groups results from mainly due to their low level of education, low participation in the community and social norms, and, more importantly, the tragic damages they experienced during the conflicts. As a result, these community members are less likely to get information about the project's objectives, benefits, risks, and impacts. There is a potential risk of exclusion of the most vulnerable groups from sharing the benefit packages of the project mainly due to risk of elite capture. There would be a possibility of manipulation by the elites the support provided from the project. There might be also lack of transparency during selection of the beneficiaries for the financial and technical assistance. Benefits may be channeled to the few who are authoritative, influential, better off, and well connected. Besides, there might be discrimination against the vulnerable group in consultations and community engagement during subproject implementation. These risks are reflected in the ESMF, SEP, and appropriate measures have been developed to mitigate them.

ESS2: Labour and Working Conditions

This standard provides specific requirements on occupation health and safety, expanding upon the World Bank Group's Environmental, Health and Safety Guidelines. It introduces labour management procedures, emphasises non-discrimination and equal opportunity, and provides for non-discrimination of workers. ESS2 recognises workers' organisations and requires a grievance mechanism for all project workers.

The project will develop a labour management plan and implement labour management procedures applicable to the project setting and ways in which project workers will be managed, in accordance with the requirements of national law and this ESS.

ESS3: Resource Efficiency and Pollution Prevention and Management

This standard recognises that economic activity and urbanisation often generate pollution to air, water and land, and consume finite resources that may threaten people and ecosystem services at the local, regional and global levels. The current and projected atmospheric concentration of greenhouse gases (GHG) threatens the welfare of current and future generations. This ESS sets out the requirements to address

resource efficiency and pollution prevention and management throughout the project life cycle consistent with Good International Industry Practises.

The ESMF should include sections on resource efficiency and pollution prevention and management.

It is worth noting that the proposed project aims to comply with national environmental laws related to pollution, wastes, hazardous materials, resource use and greenhouse gas (GHG) emissions since its geared towards renewable energy.

ESS4: Community Health and Safety

This standard recognises that project activities, equipment and infrastructure can increase community exposure to risks and impacts such as electric shocks during installation and connections, noise, pollution, hazardous materials, traffic and accidents related risks during transportation of personnel and items, an increase in crime, prostitution, GBV/SEA, labour influx, security issues and sexual exploitation. In addition, communities that are already subjected to impacts from climate change may also experience an acceleration or intensification of impacts due to project activities.

The project should address the health, safety, and security risks and impacts on project-affected communities with particular attention to people who, because of their particular circumstances, may be vulnerable like women and children.

ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement

This standard recognises that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons. Project-related land acquisition or restrictions on land

use may cause physical displacement (relocation, loss of residential land) and/or economic displacement (loss of income/sources of livelihoods). Resettlement is considered involuntary when affected persons or communities do not have the right to refuse land acquisition or restrictions on land use that result in displacement. Physical and economic displacement, if unmitigated, may give rise to severe economic, social and environmental risks.

Involuntary resettlement should be avoided; however, where involuntary resettlement is unavoidable, appropriate measures to mitigate adverse impacts on displaced persons should be carefully planned and implemented (adequately compensated). Moreover, the project will develop and implement a RPF and individual RAPs for sub-projects.

ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

Protecting and conserving biodiversity and sustainably managing living natural resources are fundamental to sustainable development. Biodiversity often underpins ecosystem services valued by humans. This standard recognises the importance of maintaining core ecological functions of habitats, including forests, and the biodiversity they support. It also recognises the need to consider the livelihood of project-affected parties, including Indigenous Peoples, whose access to, or use of, biodiversity or living natural resources may be affected by a project. It includes requirements for legally protected, designated or regionally/internationally recognised areas of high biodiversity value. It includes also provisions on invasive alien species and requirements on animal husbandry and large-scale commercial farming.

Project planning should ensure that the project takes appropriate measures to minimise potential impacts on biodiversity since activities associated with the establishment of power grids and solar systems require site clearing that could impact negatively on the biodiversity. Additionally, all areas of conservation concerns such as forests and wetlands (Sudd wetlands) should be conserved during the development of the project.

ESS7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities

This standard recognises that Sub-Saharan African Historically Underserved Traditional Local Communities (SAHUTLC) have identities and aspirations that are distinct in national societies and often are disadvantaged by traditional models of development. In many instances, they are economically marginalized and vulnerable segments of the population. Their economic, social, and legal status frequently

limits their capacity to defend their rights to, and interests in, land, territories, and natural and cultural resources, and may restrict their ability to participate in and benefit from development projects. In many cases, they do not receive equitable access to project benefits, or benefits are not devised or delivered in a form that is culturally appropriate, and they may not always be adequately consulted about the design or implementation of projects that would profoundly affect their lives or communities. This ESS recognises that the roles of men and women in indigenous cultures are often different from those in the mainstream groups, and that women and children have frequently been marginalised both within their own communities and as a result of external developments and may have specific needs.

In the context of South Sudan, all tribes can be considered as having the characteristics of SAHUTLC and fall within the purview of ESS7, so this standard is relevant for this operation. In that regard, Paragraph ESS7 indicates that when SAHUTLC are the sole, or the overwhelming majority of project beneficiaries, the requirements of ESS7 may be included in the overall project design, and preparation of a stand-alone SAHUTLC plan is not necessary.

In this regard, the project has considered the following elements of in the overall project design and the project's E&S instruments:

- ✓ The process of identifying stakeholders shall emphasize paying special attention to identifying SAHUTLC including disadvantaged or vulnerable groups.
- ✓ During subproject implementation, the risks and impacts identification process shall use socially accepted methods to identify SAHUTLC within the communities to ensure their rights to quality and accessible electricity.
- ✓ Arrange and conduct special consultations with the SAHUTLC, disadvantaged and vulnerable groups.
- ✓ Set clear and unambiguous selection criteria for beneficiaries' selection.
- ✓ Awareness should be made for the target communities about GRM.
- ✓ Promote fair treatment, non-discrimination, and equal opportunity in development activities.
- ✓ Provide equal opportunity and strictly observe non-discrimination of vulnerable groups from any benefits.

Facilitate affirmative actions for SAHUTLC as well as vulnerable groups in employment opportunity. In addition, the key findings in the ESRM instruments on SAHUTLC and other vulnerable groups have been incorporated into the project design. In addition, during the implementation of subproject activities, the risks and impacts of the project on SSAHUTLC, would be mitigated through, as it applies to the project:

1. A review of the legal and institutional framework applicable to SSAHUTLC.
2. Gathering of baseline data on the demographic, social, cultural, and political characteristics of the SSAHUTLC; the land and territories that they have traditionally owned or customarily used or occupied; and the natural resources on which they depend.
3. Taking the review and baseline data into account, the identification of project-affected parties and the elaboration of a culturally appropriate process for involving and consulting with the SSAHUTLC at each stage of project preparation and implementation.
4. The identification of project-affected parties and the elaboration of a culturally appropriate process for involving and consulting with the SSAHUTLC at each stage of project preparation and implementation.
5. An assessment, based on meaningful consultation tailored to SSAHUTLC, of the potential adverse and positive effects of the project. Critical to the determination of potential adverse impacts is an analysis of the relative vulnerability of, and risks to, the affected SSAHUTLC, given their distinct circumstances and close ties to land and natural resources, as well as their potential lack of access to opportunities relative to other social groups in the communities, regions, or national societies in which they live. The assessment should consider differentiated gender impacts of project activities and impacts on potentially disadvantaged or vulnerable groups within the community of SSAHUTLC.

6. The identification and evaluation of measures necessary to avoid adverse impacts, or if such measures are not feasible, the identification of measures to minimize, mitigate, or compensate for such impacts, and to ensure that the IP/SSAHUTLC receive culturally appropriate benefits under the project. This is based on meaningful consultation tailored to IP/SSAHUTLC.

ESS8: Cultural Heritage

This standard recognises that cultural heritage provides continuity in tangible and intangible forms between the past, present and future and tries to integrate this into project design, implementation and operation. People identify with cultural heritage as a reflection and expression of their constantly evolving values, beliefs, knowledge and traditions. Cultural heritage, in its many manifestations, is important as a source of valuable scientific and historical information, as an economic and social asset for development, and as an integral part of people's cultural identity and practice. ESS8 thus sets out measures designed to protect cultural heritage throughout the project life cycle.

The implementation of the project should consider the potential impact on intangible cultural heritage and implement measures to safeguard them where they exist. Additionally, a project-specific cultural management plan and chance finds procedure⁴ should be developed.

ESS9: Financial Intermediaries

This standard recognises that strong domestic capital and financial markets and access to finance are important for economic development, growth and poverty reduction. The Bank is committed to supporting sustainable financial sector development and enhancing the role of domestic capital and financial markets.

This standard is not applicable to this project.

ESS10: Stakeholder Engagement and Information Disclosure

Open and transparent engagement between the Borrower and project stakeholders is an essential element of good international practice. Effective stakeholder engagement can improve the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation. Stakeholder engagement is an inclusive process conducted throughout the project life cycle. Where properly designed and implemented, it supports the development of strong, constructive and responsive relationships that are important for successful management of a project's environmental and social risks.

Engage with stakeholders throughout the project life cycle and that appropriate project information is disclosed to stakeholders in a timely, understandable, accessible and appropriate manner. Additionally, develop and implement a Stakeholder Engagement Plan (SEP) proportionate to the nature and scale of the project and its potential risks and impacts.

⁴ See generic template of the CFP in Annexure X

3.5 Gap Analysis between the National Regulations and ESSs

Table 3.5: An analysis between South Sudan Laws and the World Bank ESS

| ESF Objectives | South Sudan Law Requirements | Gaps | Recommended Action |
|--|--|---|---|
| ESS 1: Assessment and Management of Environmental and Social Risks and Impacts | | | |
| <ul style="list-style-type: none"> Identify, assess, evaluate, and manage environment and social risks and impacts. Adopt a mitigation hierarchy. Adopt differentiated measures so that adverse impacts do not fall disproportionately on the disadvantaged or vulnerable. Utilise national environmental and social institutions, systems, laws, regulations and procedures where appropriate. Promote improved environmental and social performance, in ways which recognise and enhance Borrower capacity. | <p>The South Sudan Draft Environmental and Protection Bill (2015) introduce the requirements for Environmental Impact Assessments, Environmental Audits, and Environmental Monitoring. Whereas the above requirements are in line with the requirements of ESS1.</p> | <p>The ESS1 has requirements for projects to undertake Cumulative impacts Assessment, Social and Conflict analysis and Strategic Environmental and Social Assessment (SESA) and associated facilities that are missing in the South Sudan Draft Environmental Protection Bill (2015).</p> | <p>The ESMF should outline the screening process of all projects and activities in order to assess the levels of assessments that are required on the project i.e. Strategic Environmental and Social Assessment (SESA). Environmental and Social Impact Assessments (ESIAs) or a less detailed form of environmental and social assessment such as Environmental and Social Management Plans (ESMPs).</p> |
| ESS 2: Labour and Working Conditions | | | |
| <ul style="list-style-type: none"> Promote safety and health at work. Promote the fair treatment, non-discrimination, and equal opportunity of project workers. Protect project workers, with emphasis on vulnerable workers. Prevent the use of all forms of forced labour and child labour. | <p>The Labour Act, 2017: The purpose of this Act is to establish a legal framework for the minimum conditions of employment, labour relations, labour institutions, dispute resolution and provision for health and safety at the workplace, in</p> | <p>South Sudan has no statutory minimum wage.</p> <p>The age of employment is 14 years.</p> <p>Enforcement of labour laws is minimal.</p> | <p>The project will implement all reasonable precautions to protect the health and safety of workers as outlined in the World Bank EHS guidelines. Preventive and protective measures should be introduced according to the hazard mitigation hierarchy.</p> <p>EHS measures on the project should at a minimum include; aspects of the general facility design and operations, Communication and training, Physical hazards,</p> |

| ESF Objectives | South Sudan Law Requirements | Gaps | Recommended Action |
|--|---|---|--|
| <ul style="list-style-type: none"> Support the principles of freedom of association and collective bargaining of project workers in a manner consistent with national law. Provide project workers with accessible means to raise workplace concerns | accordance with the Constitution of the Republic of South Sudan, 2011, and in conformity with international and regional obligations of South Sudan. | <p>Significant amounts of unskilled jobs are filled by immigrant workers.</p> <p>Forced labour takes place, for example in recruitment into the national army.</p> | <p>Chemical hazards, Radiological Hazards, Personal Protective Equipment (PPE) and Monitoring.</p> <p>The project will comply with the Labour Act, but it will monitor wages paid and define the minimum age of employment as 18 years including instituting requirements for contractors to verify the age of workers as detailed in the Labour Management Procedures.</p> <p>The LMP should define a minimum wage based on a comprehensive bench-marking exercise that takes the prevailing local conditions into account.</p> <p>The Draft Decent work country programme that South Sudan has developed with the assistance of the International Labour Organisation (ILO) can be used to inform decent work procedures of the project.</p> <p>The project should not deploy project workers from outside the project host community at the expense of local, especially as pertains to semi-skilled and unskilled jobs.</p> <p>The project should not allow any forced labour.</p> |
| ESS 3: Resource Efficiency and Pollution Prevention and Management | | | |
| <ul style="list-style-type: none"> Promote the sustainable use of resources including energy, water, and raw materials. Avoid or minimize adverse impacts on human health and the environment caused by pollution from project activities. | The Constitution of South Sudan provides that the people of South Sudan shall have a right to a clean and healthy environment, that every person shall have the obligation to protect the environment, and that future generations shall have the | There is need for an operational environment Act and associated resource efficiency and pollution preventions regulations that are currently missing. It is worth noting the government is in the process of fast | The project should promote sustainable use of resources and avoid or minimise environmental pollution through the use of the World Bank ESF, as advised by the Undersecretary of the Ministry of Environment and Forestry. |

| ESF Objectives | South Sudan Law Requirements | Gaps | Recommended Action |
|---|--|--|--|
| <ul style="list-style-type: none"> • Avoid or minimize project-related emissions of short and long-lived climate pollutants. • Avoid or minimize generation of hazardous and non-hazardous waste. • Minimise and manage the risks and impacts associated with pesticide use. | <p>right to inherit an environment protected for the benefit of present and future generations. Specific measures to ensure the objectives above include: Prevention of pollution and ecological degradation; promotion of conservation; and securing of ecologically sustainable development and use of natural resources while promoting rational economic and social development so as to protect the bio-diversity of South Sudan.</p> | <p>tracking the Act so that it's passed into law.</p> | |
| ESS 4: Community Health and Safety | | | |
| <ul style="list-style-type: none"> • Anticipate or avoid adverse impacts on the health and safety of project-affected communities during project life-cycle from routine and non-routine circumstances. • Promote quality, safety, and climate change considerations in infrastructure design and construction, including dams. • Avoid or minimize community exposure to project-related traffic and road safety risks, diseases and hazardous materials, and have in place effective measures to address emergency events. | <p>The Public Health Act (2008) for South Sudan emphasises the prevention of pollution of air and water and also encourages improvement in sanitation. Key provisions include the protection of the sanitation of the environment and encompasses the measures to address the pollution of water and air.</p> | <p>ESS4 unlike the Public Health Act (2008), provides for the need to mitigate hazards related to the Structural Safety of Project Infrastructure at the design stage among other measures, and thereafter, the need to include Road safety initiatives proportional to the scope and nature of project activities.</p> <p>Additionally, safeguarding of personnel and property as provided for by ESS4, entails</p> | <p>Although the project aims to improve the lives of previously affected communities, it needs to ensure that project activities do not pose any unintended negative consequences on communities.</p> <p>The project should develop road safety management plan and a Health and Safety Plan, and assess and manage specific risks and impacts outlined in the ESMF.</p> <p>The project should ensure that workers and the general public are not exposed to vector borne diseases, STDs and construction and operation related safety hazards.</p> <p>The project should develop an Action Plan to address GBV/SEA during implementation of activities.</p> |

| ESF Objectives | South Sudan Law Requirements | Gaps | Recommended Action |
|---|--|---|---|
| <ul style="list-style-type: none"> Ensure that safeguarding of personnel and property is carried out in a manner that avoids or minimizes risks to the project-affected communities. | | mitigating risks related to security and GBV/SEA as may arise from the implementation of project activities. | A Security Management Plan is also required on the project. |
| ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement | | | |
| <ul style="list-style-type: none"> Avoid or minimise involuntary resettlement by exploring project design alternatives. Avoid forced eviction. Mitigate unavoidable adverse impacts from land acquisition or restrictions on land use through timely compensation for loss of assets at replacement cost and assisting displaced persons in their efforts to improve, or at least restore, livelihoods and living standards, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher. Improve living conditions of poor or vulnerable persons who are physically displaced, through provision of adequate housing, access to services and facilities, and security of tenure. Ensure that resettlement activities are planned and implemented with appropriate disclosure of information, meaningful consultation, and informed participation. | The Land Act of 2009 provides for fair and prompt compensation to any person whose right of occupancy, ownership or recognised long standing occupancy of customary use of land is revoked or otherwise interfered with by the Government. | There is no operational Land Policy to inform the existing law and as a result, the capacity of land management institutions has remained weak. | Involuntary resettlement should be avoided; however, where involuntary resettlement is unavoidable, appropriate measures to mitigate adverse impacts on displaced persons should be carefully planned and implemented (adequately compensated). It is important that the South Sudan Land Commission is engaged both at National and State level to resolve any project land related disputes that may arise. |
| ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources | | | |

| ESF Objectives | South Sudan Law Requirements | Gaps | Recommended Action |
|--|--|--|--|
| <ul style="list-style-type: none"> Protect and conserve biodiversity and habitats. Apply the mitigation hierarchy and the precautionary approach in the design and implementation of projects that could have an impact on biodiversity. Support livelihoods of local communities, including Indigenous Peoples, and inclusive economic development, through the adoption of practices that integrate conservation needs and development priorities | <p>Forests and Renewable Natural Resources Act, 2002. This is another Act that is no longer legally binding but whose principles remain useful in guiding the management of forest resources in South Sudan. The 2002 Act attempts to follow a more holistic approach by providing a framework for the management and protection of forests and renewable natural resources, including pastures, rangelands and certain aspects of agricultural land use. The Act imposes a deterrent penalty, namely the confiscation of any property, including the means of transport used in the commission of the forest offence.</p> | <p>No particular law for South Sudan</p> | <p>Development of isolated grid and densification and off-grid electrification through stand-alone solar systems may traverse sensitive ecosystems such as forests and swamps. Activities that may cause any significant loss of biodiversity (critical habitat) will be excluded for financing. . An exclusion criterion has been developed and included in the ESCP to ensure that project facilities are not sited in critical ecosystems/habitats.</p> <p>In an event that the project activities may have potential adverse impacts on biodiversity, the PIU, in consultation with the regulatory agency and the Bank, will develop and implement a biodiversity management plan. If potential risks to biodiversity are not significant, biodiversity risk mitigation measures shall be included as part of sub project ESMPs.</p> |
| ESS 7: Indigenous People/Sub-Saharan African Historically Underserved Traditional Local Communities | | | |
| <ul style="list-style-type: none"> Ensure that the development process fosters full respect for affected parties' human rights, dignity, aspirations, identity, culture, and natural resource-based livelihoods. | <p>No particular law for South Sudan</p> | <p>No particular law for South Sudan</p> | <p>Despite the absence of a law, it's important that the project interventions take into account historically marginalised groups such as the Toboza, Turkana and Buya, from Equatoria region; and the Murle, Anywaka, from Pibor area, in the Upper Nile region of South Sudan.</p> |

| ESF Objectives | South Sudan Law Requirements | Gaps | Recommended Action |
|---|---|--------|--|
| <ul style="list-style-type: none"> Promote sustainable development benefits and opportunities in a manner that is accessible, culturally appropriate and inclusive. Establish and maintain an ongoing relationship based on meaningful consultation with project-affected parties. Obtain the Free, Prior, and Informed Consent (FPIC) of affected parties. Recognize, respect and preserve the culture, knowledge, and practices of Indigenous Peoples, and to provide them with an opportunity to adapt to changing conditions in a manner and in a timeframe acceptable to them. | | | |
| ESS 8: Cultural Heritage | | | |
| <ul style="list-style-type: none"> Protect cultural heritage from the adverse impacts of project activities and support its preservation. Address cultural heritage as an integral aspect of sustainable development. Promote meaningful consultation with stakeholders regarding cultural heritage. Promote the equitable sharing of benefits from the use of cultural heritage. | The Constitution of South Sudan, Article 38 (1e) spells out to protect cultural heritage, monuments, and places of national historic or religious importance from destruction, desecration, unlawful removal or illegal export. | No gap | <p>The specific requirements below should be considered by the project:</p> <p>The project should avoid impacts on cultural heritage. When avoidance of impacts is not possible, the measures to address impacts on cultural heritage should be identified and implemented in accordance with the mitigation hierarchy.</p> <p>A Cultural Heritage Management Plan should be developed.</p> <p>The project should implement globally recognised practices for field-based study, documentation and</p> |

| ESF Objectives | South Sudan Law Requirements | Gaps | Recommended Action |
|--|--|----------------|--|
| | | | <p>protection of cultural heritage in connection with the project, including by contractors and other third parties.</p> <p>The projects Chance Finds Procedure should be followed.</p> <p>Where necessary due to the potential risks and impacts of a project, the environmental and social assessment will involve the participation of cultural heritage experts.</p> <p>Activities that may impact on known cultural heritage sites including sites that have significant important to local communities are not eligible for financing.</p> |
| ESS 9 – Financial Intermediaries | | | |
| <ul style="list-style-type: none"> Promote good environmental and social management practices in the subprojects the FI finances. Promote good environmental and sound human resources management within the FI. | Not applicable | Not applicable | Not applicable |
| ESS 10: Stakeholder Engagement and Information Disclosure | | | |
| <ul style="list-style-type: none"> Establish a systematic approach to stakeholder engagement that helps Borrowers identify stakeholders and maintain a constructive relationship with them. Assess stakeholder interest and support for the project and enable stakeholders' views to be taken into account in project design. Promote and provide means for effective and inclusive engagement with project- | The Constitution of South Sudan, Article 166 (6) expects local governments to involve communities in decision-making in the promotion of a safe and healthy environment. | No gap | The Project will implement stakeholder consultations throughout the lifetime of the project, as per the project Stakeholder Engagement Plan (SEP). |

| ESF Objectives | South Sudan Law Requirements | Gaps | Recommended Action |
|---|------------------------------|------|--------------------|
| <p>affected parties throughout the project life-cycle.</p> <ul style="list-style-type: none"> • <i>Provide project-affected people with accessible and inclusive means to raise issues and grievances, and to allow Borrowers to respond to and manage such grievances</i> • Establish a project GM that is accessible and culturally appropriate • Ensure that appropriate project information is disclosed to stakeholders in a timely, understandable, accessible and appropriate manner. | | | |

4 REQUIRED ENVIRONMENTAL AND SOCIAL BASELINE OF PROJECT SITES

4.1 Physical Environment

This section provides a brief description of the project area focusing on the relevant physical environment features within South Sudan. The data presented here is primary data (i.e., from field observations and interviews) and secondary information, which has been sourced from available published and unpublished documents. It should be noted that detailed baseline information will be collected in the subsequent site specific ESIA/ESMP studies.

4.1.1 Geographical location of South Sudan

South Sudan, officially called the Republic of South Sudan (RoSS) is a landlocked country located in the tropical zone of Eastern Africa between 3N-13N and 24E-36E (Figure 5.1). It is bordered by Ethiopia to the east, Kenya to the southeast, Uganda to the south, the Democratic Republic of Congo (DRC) to the southwest, the Central African Republic (CAR) to the West, and Sudan to the North. The country is approximately 650,000 km² in size and is situated almost entirely in the Nile River Basin, receiving water from the highlands of CAR, DRC, Ethiopia, and Uganda. The country is comprised of ten (10) states; Northern Bahr el Ghazal, Western Bahr el Ghazal, Lakes, Warrap, Western Equatoria, Central Equatoria, Eastern Equatoria, Jonglei, Unity; and Upper Nile.

South Sudan is divided into three regions, which correspond to historical provinces dating back to when South Sudan was still part of Sudan. These regions are Bhar el Ghazal in the northwest, Equatoria in the south, and the Greater Upper Nile in the northeast. These regions have no formal administrative significance but still serve as an important spatial reference point for data and information that predates the founding of the country (South Sudan Ministry of Environment and Forestry, 2021).



Figure 0.1: Location of South Sudan

4.1.2 Climate

Although South Sudan lies within the tropics, the climate ranges from arid in the north to tropical wet-and-dry in the far southwest. Temperatures do not vary greatly with the season at any location; the most significant climatic variables are rainfall and the length of the dry season. Variations in the length of the dry season depend on the two air flows (from the Arabian Peninsula and moist south-westerly winds from the Congo River Basin).

The climate of South Sudan is characteristically hot and dry with seasonal rains that are significantly influenced by the migration of the Inter-Tropical Convergence Zone (ITCZ). South Sudan has two distinct rainy seasons and high humidity (AfDB 2018). Annual rainfall ranges from 200 mm in the southeast (Eastern Equatoria) to 1,200–2,200 mm in the forest area of Western Equatoria and the highland areas (MoFA, 2018). The north-eastern part of the country is drier and in general, precipitation increases towards the southwest.

There lies a wetter/green belt zone in the southernmost part of the country near the border with the Democratic Republic of Congo (DRC) that includes Western, Central and Eastern Equatoria, which has bimodal rainfall regimes from April to June and from August to October, enabling two or three harvests a year. Annual rainfall in the green belt ranges from 800 mm to 2,500 mm. Rain in the rest of the country occurs between April and October. The heavy rains that fall in August and September cause the Nile River and its tributaries to flood, though many parts of the country are prone to flooding during the wet season, including the states of Jonglei, Unity, Upper Nile, Warrap and Northern Bahr el Ghazal, as well as parts of Western and Eastern Equatoria (MoFA, 2018).

Distinct differences in seasonal rainfall are apparent in a comparison between Malakal in the northern part of the country and Juba in the South. Overall, Juba receives more rainfall annually (953 mm) as opposed to Malakal (770 mm), which begins in March and ends in November. The dry season is particularly harsh in Malakal where on average, only one day with rainfall occurs each month. Approximately 99% of the rainfall in Malakal occurs during the 7-month wet season in comparison to 89 percent over this same period in Juba.

Temperatures in the country range from hot and dry in the southeast near the border with Kenya and northeast near the border with Sudan, to temperate in the southern highlands. Average temperatures range between 18°C and 45°C and do not vary greatly with the change in season. The hottest month is generally March; the coldest is August (MoFA, 2018). January to March is dry, hot and clear skies with temperatures between 40°C to 45°C which at times triggers conflicts over access to grazing lands; April to June heavy rains, light cloud cover, heavy westerly winds and temperatures between 36 and 39°C; July to September with heavy rains, floods and muddy lands that are often impassable, high humidity and temperatures between 30°C and 35°C and the 4th season is in October to December with light rains, clearer skies and temperatures of between 20°C and 30°C. In September, the dry north easterlies begin to strengthen and to push south and by the end of December they cover the entire country. The far south, however, with only a short dry season, has uniformly high temperatures throughout the year.

The meteorological data shows that temperatures in South Sudan are rising, and the weather is becoming drier and it is likely that these changes are related to global climate change. Since the mid-1970s, average temperatures have increased by 1°C, while some regions have experienced temperature rises of up to 0.4°C per decade. Since the mid-1970s, South Sudan has experienced a decline of between 10 to 20 per cent in average precipitation as well as increased variability in the amount and timing of rainfall from year to year. There is also some evidence that the onset of rain now occurs one month later. If the trend continues, by 2025 it is likely that the drying experienced in the north-eastern regions of Upper Nile, Jonglei and Eastern Equatoria will extend across the country, potentially affecting Bahr el Ghazal, Tonj and Unity in the North and Central Equatoria in the South.

4.1.3 Landforms and Topography

South Sudan is rich in natural resources and has an abundance of fertile agricultural areas with abundant water, as the country is bisected by the White Nile River and the many plains and plateaus are drained by its several tributaries. South Sudan is divided into several ecological zones; the rainforest, savannah woodland, flood plains, swamp and semi-desert. Physio-graphically, South Sudan is predominated by expansive flood plains and the Sudd wetlands, associated with the river Nile and its tributaries. The major geographical features are the White Nile which dominates the centre of the country and forms the vast Sudd Wetland/Swamp, one of the largest wetlands in the world. The Ironstone Plateau rises between the Nile and Congo watersheds and is characterised by numerous inselbergs. In the southern part of the country are the Imatong Mountains, rising to a height of 3,187m at Mount Kinyeti, the highest point in South Sudan. The southwestern part of the country has denser vegetation due to higher rainfall with tropical rainforest type of conditions.

4.1.4 Soils

The country's soils can be divided geographically into two categories. These are the clay soils of the central and Northern regions, and the laterite soils of the south. Less extensive and widely separated, but of major economic importance, the third group consists of alluvial soils found along the lower reaches of the White Nile and Blue Nile rivers. Agriculturally, the most important soils are the clays in central South known as cracking soils because of the practice of allowing them to dry out and crack during the dry months to restore their permeability; they are used for irrigated cultivation.

4.1.5 Hydrology

The Nile and its main tributary, the White Nile (Al Bahr El Abyad), drain South Sudan. The longest river in the world, the Nile flows for 6,737 kilometres from its furthest headwaters in central Africa to the Mediterranean and for centuries the river has been the lifeline for South Sudan. The White Nile flows north from central Africa, draining Lake Victoria and the highland regions of Uganda, Rwanda, and Burundi. At Bor, the great swamp of the Nile, known as Sudd begins. The river has no well-defined channel here; the water flows slowly through a labyrinth of small spillways and lakes choked with papyrus and reeds. Although the drainage area is extensive, evaporation takes most of the water from the slow moving 38 streams in this region, and the discharge of the Bahr al Ghazal into the White Nile is minimal. In the southeast, the Sobat River drains an area of western Ethiopia and the hills near the Sudan-Uganda border. The Sobat's discharge is considerable; at its confluence with the White Nile just south of Malakal, the Sobat accounts for half the White Nile's water.

South Sudan's water resources are unevenly distributed both spatially across the country, and temporally, since water quantities vary substantially between years depending on periodic major flood and drought events. The Nile River hydrological basin covers most of the country. Water is held in perennial rivers, lakes and wetland areas, in seasonal pools, ponds, rivers, streams and extensive floodplains. Water demand is still low given the country's relatively small population, density and the lack of industrial development but it is expected to increase rapidly in the future with projected population growth and economic development (South Sudan Ministry of Agriculture and Food Security (2018).

4.1.6 Natural hazards and disasters

Natural hazards can be categorised as: geophysical (including earthquakes, volcanos, landslides, avalanches, tsunamis etc.); meteorological (such as storms, cyclones, hurricanes, typhoons, blizzards, etc.); hydrological (that include floods, storm surges, flush floods, etc.); climatic (including droughts, extreme temperatures, wildfires, etc.); and biological (epidemics, infestations, etc.). In South Sudan key hazards include; extreme weather conditions especially droughts, torrential rains and seasonal flooding which sometimes lead to other hazards such as disease outbreaks, pest infestation, etc.

4.2 Biological Environment

South Sudan has a variety of species and ecosystems that constitute the country's biological environment. A description of some of the key aspects of the country's biological environment is highlighted in the sections below (4.2.1-4.2.3). Additionally, Figure 4.2 provides an indication of the location of some of the country's sensitive ecosystems.

4.2.1 Vegetation

South Sudan is mostly covered with natural and semi-natural vegetation with variable tree density. Vegetation cover is mostly high in the southwest, with thick tropical forests in the Greater Equatoria region, and low in the southeast and north, where semi-arid savannah dominates. Grasslands, aquatic vegetation and open water occupy the wetter regions.

4.2.2 Fauna

South Sudan harbours an immense diversity of fauna species within and outside her protected areas. Some of the endemic fauna species in the country include: the Nile lechwe, Hoogstral's Striped Grass Mouse, Nile Sitatunga and a recently discovered African climbing mouse (*Dendromus ruppi*). Other notable species in the country include: white-eared Kob, Elephants, Giraffes, common Eland, giant Eland, Oryx, Lions, wild Dogs, Buffalo, and Topi (locally called Tiang), Nile crocodile among others. Most of these species are threatened by hunting pressure and habitat loss.

4.2.3 Ecology, Biodiversity, National Parks and Protected Areas

South Sudan is divided into several ecological zones; the rainforest, savannah woodland, flood plains, swamp and semi-desert. The sudd swamp is among the world's largest tropical wetlands encompassing 5,700,000 hectares. It is a wetland of international significance (Site number 1622) under the Ramsar convention. The wetland is composed of various ecosystems, from open water and submerged vegetation to floating fringe vegetation, seasonally inundated woodland, rain-fed and river-fed grasslands, and floodplain scrubland. It is an important wintering ground for birds such as *Pelecanus onocrotalus*, *Balearica pavonina*, *Ciconia* and *Chlidonias nigra*, and home to some endemic fish, 400 bird species, 100 mammal species, 100 fish species and plant species. The swamp is threatened by oil exploration (it contains South Sudan's largest oil reserves). The South Sudan Energy Sector Access and Institutional Strengthening Project does not have components of the project occurring in the Sudd swamp. South Sudan's wide range of habitats supports a very rich diversity of both animal and plant species. However, the variety and number of different species is unknown. South Sudan has six national parks that cover an estimated area of 51,760 km², thirteen game reserves that cover an estimated area of 34,110 km² and forest reserves which cover an estimated area of 1,160 km². In South Sudan, one Ramsar-listed wetland and 3 proposed nature conservation areas. These protected areas cover more than 13% of the country's terrain/land surface. South Sudan is home to the world's second largest animal migration⁵ after the great Serengeti-Masai Mara wildebeest migration. Threats facing protected areas include wildlife poaching and trafficking, deforestation, encroachment by human settlements, livestock expansion, oil development, mining, and climate change impacts.

In South Sudan tiang, white-eared kob, and elephants are important migrations. It has also been noted by wildlife biologists that the grasslands, woodlands and swamps were home to elephants, zebras, giraffes and other animals. There are also endangered, rare and endemic mammals. The critically endangered animals, like Addax (*Addax nasomaculatus*, African wild ass (*Equus africanus*), Burton's gerbil (*Gerbillus burtoni*) (endemic to Sudan), Four-spotted gerbil (*Gerbillus quadrimaculatus*) (endemic to Sudan), Lowe's gerbil (*Gerbillus lowei*) (endemic to Sudan) and Principal gerbil (*Gerbillus principulus*) (endemic to Sudan) are found in South Sudan.

An exclusion criterion has been developed and included in the ESCP to ensure that project facilities are not sited in the protected areas. The specific sites for implementation of the project activities will be

⁵ The Wildlife Conservation Society (WCS) has estimated the migration to consist of 1.3 million Antelopes.

identified during implementation phase. The ESCP included a clear commitment which requires activities that may have adverse effects on sensitive habitat are ineligible for the project financing.

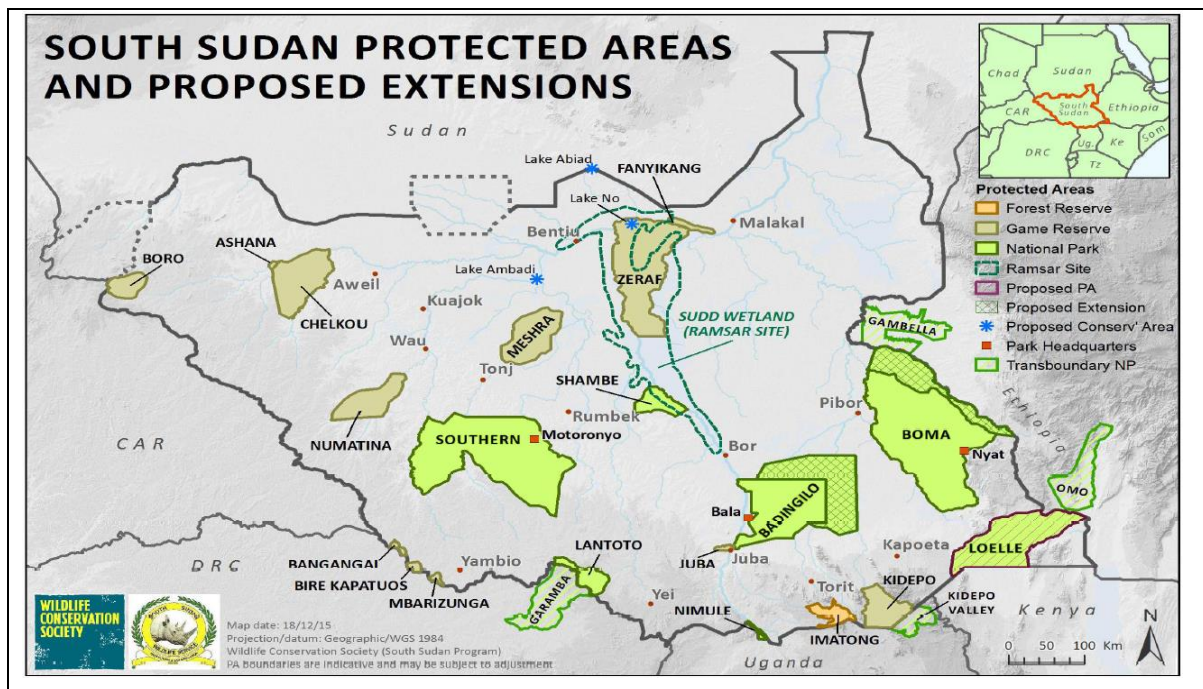


Figure 0.2: Location of South Sudan's protected areas (Source: South Sudan Fifth National Report to the Convention on Biological Diversity)

4.3 Socioeconomic

4.3.1 Population and economy

As of 1st January 2022, the population of South Sudan was estimated to be 12,054,642 people. This is an increase of 4.08 % (472,438 people) compared to the population of 11,582,204 the year before. In 2021 the natural increase was positive, as the number of births exceeded the number of deaths by 293,493. Due to external migration; the population increased by 178,945. The sex ratio of the total population was 1.015 (1,015 males per 1,000 females) which is lower than the global sex ratio. The global sex ratio in the world was approximately 1,016 males to 1,000 females as of 2021.

South Sudan's population density is 19.5 people per square kilometre (50.4/mi²) as of October 2022. The density of the population is calculated as the permanently settled population of South Sudan divided by the total area of the country. The total area is the sum of land and water areas within the international boundaries of South Sudan. The total area of South Sudan is 619,745 km² (239,285 mi²) according to the United Nations Statistics Division. The child dependency ratio for South Sudan is 89.3 %. The total life expectancy (both sexes) at birth in South Sudan is 55.1 years.⁶

4.3.2 Ethnic groups

South Sudan consists of a broad variety of ethno-linguistic groups. Those entail three subcategories of speakers of the Nilo-Saharan language family: speakers of *West Nilotic* languages (Dinka, Nuer, Atuot); speakers of *Western Nilotic / Luo* languages (Shilluk, Annual, Maban in Upper Nile and Ethiopian borderlands; Acholi in Eastern Equatoria; and Jur-Luo in Western Bahr el-Ghazal); and speakers of *Eastern*

⁶ https://countrymeters.info/en/South_Sudan#population_2022 (accessed on 14th October 2022)

Nilotic languages (Eastern and Central Equatoria: Bari, Lotuho and Teso). Furthermore, there are speakers of the *Niger-Congo* language family, including the Zande in Western Equatoria⁷.

Sub-Saharan African Historically Underserved Traditional Local Communities (SSAHUTC): Most of the communities meet the criteria of SSAHUTC, as they have distinct identities and aspirations and are often disadvantaged by traditional models of development. South Sudan consists of a broad variety of ethno-linguistic groups. Those entail three subcategories of speakers of the Nilo-Saharan language family: speakers of West Nilotic languages (Dinka, Nuer, Atuot); speakers of Western Nilotic / Luo languages (Shilluk, Anual, Maban in Upper Nile and Ethiopian borderlands; Acholi in Eastern Equatoria; and Jur-Luo in Western Bahr el-Ghazal); and speakers of Eastern Nilotic languages (Eastern and Central Equatoria: Bari, Lotuho and Teso). Furthermore, there are speakers of the Niger-Congo language family, including the Zande in Western Equatoria.⁸

4.3.3 Poverty and vulnerability

In 2009, slightly over half (51%) of South Sudan's population was living below the poverty line. 55% and 24% of the rural and urban populations, respectively, were living below the poverty line. More than 60% of the population in the former Northern Bahr el Ghazal, Unity and the Warrap States were living below the national poverty line compared to 25.7% in Upper Nile, 42.1% in Western Equatoria, and 43.2% in Western Bahr el Ghazal. While, poverty levels were reduced to 47% in 2011, they reached 57% in 2014 and 2015. In 2015, 68% of the population was estimated to be living below the poverty line. In the same year, the poorest households had up to 7.2 members, representing a higher dependency ratio compared to 4.9 household members in the richest households (*Global Initiative on Out of School Children, South Sudan Country Study (May 2018)*).

Recurring and unresolved conflict leading to displacement and the disruption of stable livelihoods, waves of food insecurity, and an almost undiversified economy have driven up poverty levels. Urban poverty rose by 20 percentage points from 49% in 2015 to 70% in 2016; three out of four households headed by females were living below the international poverty line and consuming 41% less than the international poverty line.

Poverty is more prevalent among female-headed households at 83%, compared to 73% for male-headed households. Women are also less likely than men to be employed as wage and salaried workers (38% vs 46%). In addition, with very limited or no access to livelihood or productive assets and control over household income, women face higher levels of intimate partner violence and marginalisation.

4.3.4 Internally Displaced Person (IDPs) and Refugees

South Sudan has Africa's biggest and the world's third-largest refugee crisis. Since the outbreak of the South Sudanese War in 2013, almost four million South Sudanese have been displaced. As of September 2021, there were 1.7 million internally⁹ displaced persons in South Sudan. The states of Warrap, Jonglei, Central Equatoria, and Upper Nile accounted for over two hundred thousand displaced persons. Over two million South Sudanese sought safety in neighbouring Uganda, Kenya, Ethiopia, Sudan, and the Democratic Republic of the Congo.¹⁰ South Sudan hosts about 330,000 refugees, majority of them at JamJang (126,601) and Maban (176,844) near the northern border with Sudan and these will benefit from affordable and reliable electricity service.

More than 16,000 South Sudanese fled the country and sought refuge mainly in Uganda, Sudan and Ethiopia in the first quarter of 2020. Refugee host countries include; Uganda (40.7 percent), Sudan (34.6 percent), Ethiopia (16.5 percent), Kenya (5.8 percent), and DRC (2.5 percent). South Sudan is host to more than 316,000 refugees of whom 93 percent are from Sudan.

⁷ Joseph H. Greenberg (ed.), *Universals of Human Language*, Cambridge Mass. MIT Press, 1963

⁸ Joseph H. Greenberg (ed.), *Universals of Human Language*, Cambridge Mass. MIT Press, 1963

4.3.5 Land uses and livelihoods

South Sudan's total land area is 619,745 square kilometers of which more than half is estimated to be suitable for agriculture although only 5% is currently utilised for that purpose. In addition, South Sudan has the second-largest wetland in Africa and the largest intact savanna ecosystem in East Africa. Natural forests and woodlands cover 29% of the total land area. Based on a number of studies from 1973 to 2007, the average annual rate of deforestation was approximately two percent. There are currently six national parks and 13 game reserves in South Sudan, covering 11% of the land area (90,755 square kilometers).

Approximately 78% of all households earn their livelihood from farming, pastoralism, or a mix of both. Farming is predominantly rainfed, and farmers cultivate their small plots with handheld tools. Some common agricultural products include pineapple, cotton, groundnuts, sorghum, millet, wheat, cotton, sweet potatoes, mangoes, pawpaw, sugarcane, cassava and sesame. Pastoralists hold approximately 8 million cattle. Additionally, there are millions of poultry, goats, pigs, horses, donkeys and sheep. Sedentary farming is on the rise in South Sudan, which has reduced the amount of grazing land available for pastoralists.

4.3.6 Access to public services (electricity, communication, transport, health facilities, water and sanitation)

Water and sanitation

Fifty percent (50%) of the population of South Sudan has access to basic drinking water sources, however, 30 to 50% of water facilities are non-functional at any point in time due to a lack of spare part supply chains, weak Water Sanitation and Hygiene (WASH) infrastructure maintenance capacity, poor overall WASH management practices, and/or inappropriate choice of technology. Thus, the actual level of access to an improved water source in rural areas is estimated to be only 34%, and this affects most of the country as over 80% live in rural areas, as well as 90% of those living in poverty. Only 2.2% of households have water on their premises with a twentyfold difference between the urban (9.3%) and rural (0.4%) population, while 34% travel more than 30 minutes to collect water. The laborious daily task of obtaining water is overwhelmingly done by women. Adult women are most commonly the water carriers (85.6%), but female children under age 15 are also significant collectors (8.8%).

Education

South Sudan's General Education Act, 2012, articulates the three levels that comprise the country's Formal Education System, including pre-school, primary education, and secondary education. Pre-school involves two years of study and targets three- to five-year-old children. The primary education cycle is eight years, with the official entrance age set at six years old. Following completion of eight years of schooling, students sit for the primary school leaving certificate examinations, which are administered by the Ministry of General Education and Instruction (MoGEI) in coordination with the state Minister of Education. The secondary education cycle is comprised of four years in general education schools or technical and vocational education and training (TVET) centres, which award craft and artisan diplomas after the programs. Tertiary education in South Sudan includes; university programmes which lead to a diploma, bachelor's degree, or master's degree or teacher training institute (TTI) programmes, which culminate in a teacher training certificate.

South Sudan has some of the lowest literacy rates in sub-Saharan Africa and the lowest in the geographical regions of East and Central Africa. In 2009, the literacy rate for 15-year-olds and above was 27%, almost 40 percentage points below the sub-Saharan Africa average (64%) and those between 15 and 24 years old fared slightly better with a 40% literacy rate, although clear disparities exist between rural (34.6%) and urban (65%) areas. South Sudan has the lowest proportion of female students enrolled in primary school and the second lowest in secondary school in sub-Saharan Africa and the lowest in the geographical regions of East and Central Africa. Girls are grossly under-represented in South Sudan's education system.

Health facilities

Health services in Southern Sudan remained extremely weak during and after the war, causing the health status of the population to plummet to one of the poorest globally. The maternal mortality ratio is estimated at 2,037/100,000, the infant mortality rate at 150/1,000, the child mortality rate at 250/1,000, and the fertility rate at 6.7. Diseases and other aspects of maternal and child health are particular problems. Problems like high fertility, sexual violence, malaria, and poor coverage of skilled delivery care are detrimental to maternal health. Diarrheal and respiratory infections as well as vaccine-preventable diseases account for high levels of child morbidity and mortality.

South Sudan has some of the worst health indicators in the world. Although the under-five child mortality rate, which represents the probability of a child dying before five years of age, has declined significantly over the past decade, it still stood at 91 per 1,000 live births in 2016. The infant mortality rate or the number of deaths of children under one year old per 1,000 live births has also dropped in the past decade but remains far above the global infant mortality rate of 30.5 (2016) at 59 per 1,000 live births in 2016. Maternal mortality rates are the fifth highest in the world, with complications during pregnancy and childbirth as the leading causes of death for women in South Sudan.

Electricity

Electricity access in South Sudan is significantly poor that less than 1% of the population (approximately 22,000 customers) consumed about 70 gigawatt hours (GWh) of energy. Due to the low access rate, most of the population relies on biomass burning as its primary energy source for cooking, lighting, etc.¹¹ Since attaining independence, South Sudan has struggled to shed a myriad of problems from internal conflict, flash flooding, and widespread food insecurity in the country despite a long-lasting cessation of political conflict. The South Sudan government signed a Memorandum of Understanding with Ethiopia for the purchase of 100 MW of electricity. Ethiopia and South Sudan will construct a 357 km, 230 kV transmission line that will connect Ethiopia's Gambella region to South Sudan's Malakal region. There are also plans to construct another 700 km line from Ethiopia's Tepi distribution centre to South Sudan's capital city, Juba.

The country's total installed power capacity is approximately 109 MW, all from thermal sources, of which around 76.5 MW is operational but only around 34.5 MW is available to the general public and 52 Mw is in the oil field. Juba has the only functional grid in the country. The city has a significant number of potential users, primarily households that are not yet connected to the grid. While Juba already has approximately 30,000 customers connected to the grid, JETCO estimates that there are 16,000 unconnected potential customers, of which 10,000 can be connected at relatively low cost using existing transformers.

Such investments to connect more customers to the Juba grid also helps address the risk of oversupply in the Juba grid, which has 40 MW of solar capacity under construction and a solar IPP in the pipeline, in addition to the existing 33 MW thermal capacity, against recent peak demand of around 20 MW. In parallel, options to lower the retail tariff in the Juba grid will also be explored.

An additional 16,000 connections (for densification out of which 10,000 will be connected from the existing idle 24 transformers), and network strengthening (intensification) for up to additional 15,000 connections. According to the study carried out by SMEC (financed by the AfDB), 155 kms of MV lines (172 kms already exist), 890 kms of LV lines (424.48 kms already exist), and 462 distribution transformers (350 transformers already exist).

Grid customers in Juba pay an average tariff of US\$ 42 per kWh, which is among the highest in Sub-Saharan Africa. Even the lifeline segment of the tariff for residential customers consuming under 100 kWh per month is priced at US\$ 31.6 per kWh. This is exceptionally expensive compared to regional peers (US\$ 3.6 per kWh in Ethiopia and US\$ 13 per kWh in Uganda in 2018).

Approximately 750,000 people, or 7% of the national population in South Sudan, are estimated to live in Aweil, Wau, Rumbek, Yambio, Bor, and Malakal. A geospatial analysis carried out identified these cities as strong candidates with significant concentration of potential electricity demand to be supplied with mini-

¹¹ Strategic Environmental and Social Assessment (SESA) 2016. Energy Sector Technical Assistance Project (ESTAP) Final Report. Ministry of Energy and Dams (Med) Energy Sector. WSP Canada Inc.

grids in a cost-effective manner. These cities host critical public infrastructure, including hospitals, primary and secondary schools, and public buildings, as well as key economic hubs such as agricultural markets. Additional sites outside the regional capitals can also be considered if significant demand is identified.

Communication

Assessment findings show that the channels of communications available in South Sudan widely vary depending on the geographic areas where displaced people and hard-to-reach communities are located, due to uneven coverage of phone networks, internet, and FM radio infrastructure. In both displacement sites and hard-to-reach areas, direct communication in person is still the most widely used communication channel. Among those who primarily receive information in person or on the phone, friends and relatives were most frequently the primary sources of information.

While the telecommunications infrastructure of South Sudan is among the least developed in the world and the lack of phone network was cited as a major barrier to news and information access, surveyed IDPs and communities in hard-to-reach areas mostly cited barriers to news and information access that are rather contingent on social factors, such as language barriers, lack of trust and illiteracy. When it comes to more traditional forms of communication, a wide range of channels are still used by communities in remote areas, including cattle horn blowing, drum beating, smoke signals, traditional dances and sending runners to neighbouring villages. However, reliance on these traditional forms of communication is declining due to continued displacement and the increasing penetration of devices that allow for timely sharing of information across longer distances.¹²

Mobile networks in South Sudan are limited to major towns (about 20 percent of the country), cutting out the population of remote areas. Mobile coverage was much higher before the conflict, but the ensuing war led to the switch of telecom masts. The World Bank estimates that mobile cellular subscription in South Sudan has dropped from 22 percent in 2016 to only 12 percent in 2017.

At only 12 percent, also the Internet penetration rate of South Sudan remains low compared to other countries in the eastern Africa region. Although there has been seemingly a growth in the popularity of Internet services in the country, the continued conflict and low investments in telecommunication infrastructure have affected their expansion. Open-source data indicate that 2.2 million of the country's population are connected to the Internet, accounting for only 17 percent of the country's population estimated at 12.5 million.¹³

Transport

South Sudan has an estimated road network of 12,642 km; consisting of 7,369 km of Interstate roads, 1,451 km of State primary roads and 3,822 km of State secondary roads. South Sudan's road infrastructure was largely destroyed or left in disrepair during the protracted civil wars. After the signing of the Comprehensive Peace Agreement (CPA) in 2005, significant construction and rehabilitation projects were initiated and implemented including the Emergency Road Repair Program (ERRP) and Sudan Emergency Transport Infrastructure Development Project (SETIDP). The main objective of these projects was to restore and maintain basic links between major towns and regions in the country. As a result, around 5,000 km of trunk roads were constructed/rehabilitated to all-weather gravel roads standard.

Transport costs in the country are high, freight tariffs on trunk roads reach \$0.20 per ton km, roughly three or four times the average tariff of Eastern Africa and Southern African countries respectively. The poor infrastructure in the country also increases travel times, this coupled with a significant reduction of loads on several trucks for safety reasons substantially raises the transport costs per ton in South Sudan.

Heavy rains, increased levels of traffic, overloaded trucks and inadequate maintenance have often led to the deterioration of the rehabilitated roads in the country. As a result, only 40% of these improved trunk roads are in a good condition, the remaining 60% are deemed to be in a fair condition. The only paved

¹²<https://www.reach-initiative.org/what-we-do/news/south-sudan-challenges-and-opportunities-for-communication-with-disaster-affected-communities/> (accessed on 14th October 2022)

¹³ <https://medialandscapes.org/country/south-sudan/telecommunications/mobile-coverage>

roads are the Juba-Nimule link to Uganda (193 km), which is under upgrading to a Double Bituminous Surface Treatment (DBST) standard, the 65 km of urban roads that were recently rehabilitated or upgraded in Juba and a few sections of urban roads in Wau and Malakal. The remaining gravel roads, earth roads and tracks are in a state of disrepair with the majority being impassable during the rainy season.¹⁴

4.3.7. Gender

Women and girls in South Sudan suffer from significant discrimination, including in education, economic empowerment and public participation, and are subject to widespread GBV, including domestic violence, gang rape and other abuses. Women and girls are typically left out of decision-making processes and political representation, leading to local and community-based decisions that do not account for their unique needs and capacities. This produces a ripple effect on labor or economic opportunities, risks of GBV and educational opportunities.

While the 2009 Land Act provides equal access and rights to land tenure for both men and women, customary justice outcomes indicate that women are consistently blocked from securing and owning property. Conflict has severely affected women and girls' access to services, such as education, WASH and health services, including sexual and reproductive health, has decreased to even lower levels.

4.3.7 SEA/SH

Women are targeted for sexual assault, either in military raids or by intimate partners. About 65% of women in South Sudan have been victims of physical and sexual violence and some 51 % have suffered intimate partner violence. In addition, approximately one in three women has experienced sexual violence from a non-partner, often occurring during raids, displacement, or abductions perpetrated by one ethnic tribe against another. The risk of sexual violence negatively affects women's ability to access income and resources.

A standalone GBV risk assessment and prevention plan has been prepared for the project.

4.3.8 Cultural Heritage

Historically, the area that is now South Sudan was dominated by Central Sudanic-speaking ethnic groups. The Nilotic peoples dominated the occupation of South Sudan as early as 3000 BC. Their expansion began around the 14th century following the collapse of major Christian Nubian kingdoms in what is now Sudan. Prior to the expansion of Egypt into southern Sudan in the 19th century, there were many different types of polities in southern Sudan. They consisted of highly structured kingdoms, such as the Shilluk and Azande, which constituted powerful regional forces in the pre-colonial Horn of Africa and Central Africa.

There is no accurate demographic data on minorities and indigenous groups in South Sudan. In 2008, the census was rejected by the then governing semi-autonomous Government of Southern Sudan and a post-independence census has not been undertaken since 2011. With ethnic groups speaking more than 70 associated languages, there is substantial diversity in South Sudan. The main languages are English (official), Juba Arabic (lingua franca), diverse dialects of Nilotic, Nilo-Hamitic and Sudanic languages, including Dinka, Azande, Nuer and Shilluk. The main religions include Christianity, indigenous beliefs, and Islam. The largest linguistic groups define the Western Nilotes – Anuak, Dinka, Murle, Nuer, and Shilluk. They traditionally come from the Northern and Eastern areas of South Sudan, as well as from parts of South Kordofan, White Nile in Sudan and the Gambella region of Ethiopia. Further south in Equatoria, indigenous groups such as the Azande, Bari, Latuka, Madi, Moru, Taposa and Turkana can be found. They constitute a mixture of Sudanic, Eastern Nilotes, and other groups.

¹⁴ South Sudan: An Infrastructure Action Plan; <https://pdfslide.net/documents/transport-infrastructure-and-services-transport-infrastructure-and-services.html?page=1> (accessed on 14th October 2022)

5 ESMF PROCEDURES

5.1 Overview of the Environmental Screening and Impact Assessment Process

The ESMF is designed to support application of the World Bank's ESS in combination with applicable South Sudan legislation related to environmental management and conservation. The World Bank's ESS1 stipulates that it is the responsibility of the borrower to screen, assess, manage and monitor Environmental and Social risks and impacts related to projects. The standard further indicates that the borrower should ensure compliance with national regulations and laws to screen and assess environmental and social risks and impacts.

The prime legislation for environmental and social assessment in South Sudan is the Draft South Sudan Environmental Protection Bill (2015) which introduces requirements for Environmental Impact Assessments, Environmental Audits and Environmental Monitoring for projects. It is expected that requirements in the Bill will be followed and be augmented by the more stringent World Bank Environmental and Social Framework (ESF) requirements, during the implementation of project activities. The steps indicated below will be used to screen the subprojects under components 1, 2 and 3 of the projects.

The World Bank's Environmental and Social Framework provides a risk classification of projects into one of the four categories indicated and defined below:

- a) **High Risk:** Project has significant adverse or long term Environmental and or social risks and impacts that are diverse, irreversible, or unprecedented. These may require more specialised or financial means to manage them which the borrower may not have.
- b) **Substantial Risk:** Project has potential limited adverse environmental or social risks and/or impacts that are few in number, generally site specific, largely reversible, and readily addressed through mitigation measures.
- c) **Moderate Risk:** Project has minimal adverse environmental or social risks and/or impacts.
- d) **Low Risk:** Project has no adverse environmental and social risks and impacts.

The PIU will ensure that the environmental and social assessment of subprojects takes into account in an appropriate manner all issues relevant to the project, including:

- The country's applicable policy framework, national laws and regulations, and institutional capabilities (including implementation) relating to environment and social issues; variations in country conditions and project context; and obligations of the country directly applicable to the project under relevant international treaties and agreements;
- Applicable requirements under the ESSs (1,2-8 and 10); and
- *The Environment, Health and Safety Guidelines (EHSGs) of the World Bank, and other relevant Good International Industry Practice (GIIP). EHSGs that are applicable to the project include those related to the following aspects: (Air emissions and Ambient Air Quality, Energy Conservation, Wastewater and Ambient Water Quality, Water Conservation, Hazardous Materials Management, Waste Management, Noise Management, etc.). Moreover, the World Bank Group Environmental, Health, and Safety Guidelines for Electric Power Transmission and Distribution will be directly utilised.*

The environmental and social assessment will apply a mitigation hierarchy which will:

- a) Anticipate and avoid risks and impacts;
- b) Where avoidance is not possible, minimise or reduce risks and impacts to acceptable levels;
- c) Once risks and impacts have been minimised or reduced, mitigate; and

- d) Where significant residual impacts remain, compensate for or offset them, where technically and financially feasible.

5.2 The Screening Process

5.2.1 Step 1: Scoping/Screening

The screening process determines the level of environmental and social assessments (E&S) that is required for a given project. It is the first step to determine the environmental and social aspects of sub-projects so as to ascertain the type of environmental and social assessment required in accordance with ESS1 and consistent with the ESSs. The objectives of screening are to:

- a. Briefly identify the environmental and social risks and impacts of a subproject;
- b. Determine the type/s of mitigation measures;
- c. Specific plan(s) or safeguard instrument(s) to be prepared based on the outcomes of the screening; and
- d. Identify eligible or ineligible project activities for further or no environmental and social assessment, respectively. This is done by analysing the proposed activities in relation to their environmental & social context using a checklist approach. An Environmental and Social Screening form is provided in Annexure II.

According to the current screening, the overall risk rating category for the proposed project is **substantial**. In particular, the following risks are considered high and the reasons are indicated:

- **Political and governance:** A national election is scheduled in 2024 when the current transition government's mandate will expire. There is a high risk that the forthcoming election will arouse political instability turmoil to trigger rebels and conflicts across the country, hampering smooth project implementation on many fronts.
- **Institutional capacity for implementation and sustainability:** Energy project development and implementation have been very limited in South Sudan, largely owing to the political instability and weak institutional capacity that hinders sustainable project implementation. The energy sector overall suffers from the lack of resources and investments. GoSS civil servants are chronically underpaid and often paid with significant delays, which not only lowers their work morale and ethics but also leads to a serious brain drain of essential technical expertise.
- **Fiduciary:** Project implementation in South Sudan face a wide range of fiduciary risks caused by a weak regulatory environment, low institutional capacity, and an under-developed financial sector. The country also faces high levels of corruption and lack of accountability—ranking 179 out of 180 on Transparency International 2020. The chronic underpayment and/or non-payment for civil servants creates fertile grounds for potential corruption and use of World Bank funds for ineligible expenditures. There is also an associated risk that the pay scale difference between the civil servants in the energy sector and the individual consultants hired for the project may lower the civil servants' work morale, discouraging their participation and collaboration.
- **Environmental and Social:** Although the planned project activities are not anticipated to cause major environmental and social harms, the environmental and social risk of the project is rated high mainly due to the contextual fallout risks from the above-mentioned political, institutional, and fiduciary risks.

The environmental and social categories that apply to the subproject components, will be deduced from the screening of environmental and social impacts, which takes place during the pre-appraisal of the investments. Environmental and social screening will be undertaken to ascertain the level of environmental and social impact studies and the details that will be considered/required in the project's environmental and social report.

It is anticipated that some of the South Sudan Energy Sector Access and Institutional Strengthening Project subprojects may have substantial, moderate or low potential environmental and social risks. For avoiding significant environmental and social risks at the planning stage, the following criteria would be under consideration to exclude subprojects from financing by Component 1, 2, and 3. These are:

- Construction of mini and off grid project components in environmentally sensitive areas such as National Parks, fragile ecosystems, and wildlife reserves;
- Subprojects causing significant conversion or degradation of critical cultural heritage sites and critical natural habitats including habitats of wildlife and fisheries.
- Activities that may cause any significant loss of biodiversity.
- Activities that involve removal or conversion of forests and other natural resources, including
- the quality or quantity of water or a waterway shared with other nations.
- Activities that involve land use changes such as drainage of wetlands and cultivation.
- Activities that involve in area of improper disposal of hazardous and non-hazardous waste.
- Activities that involve in areas prone to high natural disaster risks.
- Activities that have a high probability of causing serious adverse effects to human health and/or the environment.
- Activities that would disproportionately affect the historically underserved and vulnerable groups.
- Activities that may have significant adverse social impacts and/or may give rise to significant social conflict;
- Land acquisition and/or resettlement of a scale or nature that will have significant adverse impacts on affected people, or the use of forced evictions; and
- Activities that involve the use of forced or child labour.

The environmental and social screening will occur during the early planning of the South Sudan Energy Sector Access and Institutional Strengthening Project subprojects, as soon as the likely site locations and designs are known for the sub-projects. The screening form will be completed by the project E&S specialists in conjunction with technical staff who will be trained in the use of the checklist and fundamentals of what could constitute environmental and social risk.

5.2.2 Step 2: Assigning of Environmental and Social Risk Classification

Assigning of appropriate environmental and social risk classification to a sub-project activity shall be based on information obtained by completing the environmental and social screening form (Annex I). The PIU E&S specialists shall undertake the environmental and social screening process and assign the appropriate risk classification for the subproject (s) – Low, Moderate, Substantial or High. The classification should be assigned based on the criteria provided in Annex II. It is noted that subproject screening as high-risk subproject should be excluded. Guidance for subproject risk categorization. Even though the South Sudan Environmental Protection Bill (2015) allows for some screening decision to be made based on a Project brief document (i.e., a document supposed to be equivalent with an E&S screening report), it is still at draft stage and has not been enacted by the legislative body of the South Sudan to become a binding law. Thus, the project will adhere to the World Bank guidance for subproject risk classification in the absence of a legally binding national system.

5.2.3 Step 3: Environmental and Social Assessment

Upon review and approval of the screening report and risk rating, the PIU will consult with the World Bank and decide on the type of additional E&S instrument to be undertaken. This is likely to be an Environmental and Social Impact Assessment (ESIA) for high and substantial risk or an Environmental and Social Management Plan (ESMP) for moderate or low risk (if any). The ESIA Study will entail a systematic

investigation of all risks and impact areas as identified in the screening report. For High and Substantial risk subprojects, the environmental assessment will have to fulfil ESS 1 requirements elaborated under section 5 above. Again, the South Sudan draft Environmental Protection Bill (2015) allows for decisions to be made on the level of environmental assessment to be made based on the Project brief document (i.e., a document likely to be equivalent with an E&S screening report). Such decisions would have involved whether the subproject will need to further prepare an ESIA or a preliminary environmental assessment to provide more information to determine a screening decision. However, the draft environmental protection bill is still at draft stage and hasn't been enacted by the legislative body to become a national binding law. In this case, subprojects having moderate E&S risk category will have to follow only the World Bank procedures for determining the type of instruments to be prepared.

5.2.4 Step 4: Review and Approval

The E&S instruments (i.e., ESIA or ESMP, RAPs) will be developed and their associated E&S monitoring plans, will be submitted to the Ministry of Environment and Forests for approval. However, the PIU and the World Bank will also undertake independent review and clearance of the same. The E&S Instruments (i.e., ESIA or ESMP, RAPs) prepared will be reviewed by the Environmental and Social Specialists of the PIU. Thereafter they will be submitted to the World Bank for review and comment. When the World Bank ensures that all comments are addressed, it would give approval and clear the document. Once cleared by the World Bank, ESIA or ESMP, RAPs will be submitted to the Directorate of Environment and Sustainable Development of the Ministry of Environment and Forest of South Sudan for obtaining "Letter of no objection". The Ministry has responsibility for final approval after reviewing the draft environmental and social impact study and providing the project proponent with written comments. After review of the draft environmental social impact study and the Ministry is satisfied that it is complete, then it will issue a "Letter of no objection" for the ESIA study report. Where the Environmental and Social Impact Assessment study report is found to be inadequate, the Ministry shall return it to the proponent for revision, taking into consideration the comments and objections of the Ministry of Environment and Forest. The approved E&S monitoring and management plans will be included in project work bids and contracts so that it is part of the contractual obligation of successful bidders/contractors to prepare and implement Contractor ESMPs (C-ESMPs). Importantly, Contractors will be required to develop their own ESMPs for the activities that they will be undertaking. The developed ESMPs should be aligned with the ESMF/ESMP requirements and be compliant with the World Bank ESF. No work will /should be undertaken by a contractor before they receive PIU approval for the ESMPs that they have developed.

5.2.5 Step 5: Public Consultations and information Disclosure

Public consultations are required during the screening and the environmental and social assessment process and during the validation of the ESIA/ESMP. Public consultations should be conducted in a manner accessible to all project stakeholders including disadvantaged groups and given reasonable notice and taking into account the guidance set out in the project SEP and any other relevant guidance such as COVID 19 guidelines, the Technical Note: Public Consultations and Stakeholder Engagement in WB-supported operations when there are constraints on conducting public meetings. Supporting evidence of comprehensive public consultations shall be required, such as signed minutes of consultation meetings, attendance lists and filled questionnaires. The results of public consultations shall be incorporated and or influence the design of mitigation and monitoring measures. ESIA reports for the subproject shall be disclosed in-country by the PIU and in formats that are accessible to all project stakeholders and on the World Bank info shop website.

5.2.6 Step 6: Monitoring, Supervision and Reporting

Implementation, monitoring, supervision and reporting, will make reference to the various management and E&S monitoring and management plans that will be developed. Environmental and social risks and impacts monitoring seeks to check the effectiveness and relevance of planned mitigation measures through the implementation/operation phase. The PIU will monitor the environmental and social performance of the project in accordance with the Grant Agreement. The PIU Environment and Social specialists shall monitor implementation of E&S risk mitigation measures at the national level by coordinating and working

closely with the E&S focal persons of the beneficiary state ministries for MoED, and SSEC as well as the responsible governmental body MoEF. The C-ESMPs should be in place before commencement of any works in the field. The E&S focal persons at state ministries will undertake regular supervision of the subprojects during implementation and a contractor-ESMP (C-ESMP) report will be prepared before payment. The PIU E&S risk management specialists shall provide technical support to the state ministry E&S focal persons and ensure that the environmental and social screening process and C-ESMP development is undertaken appropriately.

The PIU will provide regular reports, as set out in the ESCP, to the Bank of the results of the monitoring. Quarterly, biannual and annual environmental and social risk management monitoring reports must be prepared by the PIU in collaboration with the beneficiary state ministry environment focal persons. The environmental and social risk management monitoring reports should be submitted to the energy sector steering committee (MoED ,SSEC and MoEF) and the World Bank for review. Such reports will provide an accurate and objective record of project implementation, including compliance with the ESCP and the requirements of the ESSs. Such reports will include information on stakeholder engagement conducted during project implementation in accordance with ESS10.

The PIU in conjunction with the E&S focal persons of the beneficiary state ministry and the Contractors should notify the Bank promptly of any incident or accident (i.e., any serious injury or fatality) categorised as 'severe', within 48 hours to the World Bank. This may include cases of child abuse, gender-based violence, pesticide spills or misuse, diversion of pesticides or any dispute between local communities. The notification should provide sufficient details of the incident or accident, indicating immediate measures taken or planned to be taken to address its consequences, as well as any information provided by any contractor and supervising entity, as appropriate. Subsequently, as per the World Bank's request, the PIU team shall prepare a report of the incident or accident and propose measures to prevent its recurrence.

5.2.7 Step 7: Annual Reviews

The ESMF implementation will also be supported by conducting annual environmental and social performance audit (including audit of implementation of ESIA/ESMPs) that will be carried out by a third party. The third-party annual environmental and social performance audits will be conducted on the South Sudan Energy Sector Access and Institutional Strengthening Project subproject and associated facility activities to evaluate the overall implementation of the ESMF. The annual environmental and social performance audits will be considered to be the principal source of information to Project management for improving environmental and social performance. It is expected that these annual performance audits will be carried out by registered and licensed independent consultant firm that is not otherwise involved in the Project.

6 ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES

This chapter describes the methodology by which potential project-related impacts and risks can be assessed and related mitigation measures suggested according to the mitigation hierarchy. Additionally, potential positive impacts/benefits and adverse/negative impacts of the project that could be deciphered at this stage, have been provided to guide the implementation of activities on the project's sub-projects. Considerations for cumulative impacts have been included in this chapter.

6.1 Impact Assessment Methodology

6.1.1 Impact description

A potential impact is both a description of the planned project activities and their effects on the environmental or social receptors. Relevant impact characteristics include:

- Adverse or beneficial;
- Direct or indirect;
- Short, medium, or long-term in duration; and permanent or temporary;
- Local, regional or global scale affect, including trans-boundary (neighbouring countries), and;
- Cumulative (such an impact results from the aggregated effect of more than one project occurring at the same time, or the aggregated effect of sequential projects. A cumulative impact is *"the impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future action"*).

The relative intensity of the impacts can be assessed by these characteristics. The sensitivity of the environmental and social receptors can be determined by specialists by ranking the components of the baseline data collected during the ESIA.

6.1.2 Impact severity for planned activities

The impact severity can be determined by evaluating the intensity of the impact and the sensitivity of the environmental and social receptors. This is largely subjective but based on the professional judgement of the specialist team/personnel. This methodology requires assigning of numerical descriptors to the impact intensity, as well as the environmental and social receptors, for each potential impact. The numerical descriptors are 1, 2, 3, or 4; which are equivalent to very low, low, medium or high respectively. The impact severity is then calculated as the product of the two numerical descriptors, which is equivalent to negligible, minor, moderate or major, as indicated in Table 6.1. This is a semi-qualitative method designed to provide a broad ranking of the different potential impacts of a project.

6.1.3 Impacts of unplanned events (contingencies)

Impacts associated with unplanned events (or contingencies), such as vehicle accidents, earthquakes, floods or fires, are difficult to assess within the framework outlined above, because:

- The frequency of unplanned events is usually low, since operational procedures are designed to minimise the risk of an occurrence;
- The intensity of these impacts is difficult to quantify, since there is a wide range of possible events (i.e., the impact intensity is highly variable); and
- Unplanned events that may result in a severe environmental or social impact usually result in high financial, social and political liabilities and costs for the project developer. Therefore, the project has substantial built-in controls to avoid such occurrences. The probability of unplanned events (contingencies) occurring should always be low so they are not assessed (in terms of assigning a significance rating) in the impact assessment, whereas expected potential impacts are assessed.

6.1.4 Mitigation and residual significance

Potential impacts are assessed for severity and mitigation measures are designed to reduce the impact severity. The impact severity is then re-assessed, assuming application of the mitigation measures, to derive the “residual” impact severity.

Table 0.1: Determination of impact severity

| | | | Sensitivity of receptor | | | |
|---------------------|----------|---|-------------------------|---------------|---------------|---------------|
| | | | Very low | Low | Medium | High |
| | | | 1 | 2 | 3 | 4 |
| Intensity of impact | Very low | 1 | 1 Negligible | 2 Minor | 3 Minor | 4 Minor |
| | Low | 2 | 2 Minor | 4 Minor | 6 Moderate | 8 Moderate |
| | Medium | 3 | 3 Minor | 6 Moderate | 9 Moderate | 12 Major |
| | High | 4 | 4 Minor | 8 Moderate | 12 Major | 16 Major |

6.2 Positive impacts of the project

The major beneficial /positive impacts associated with implementation of the components of the South Sudan Energy Sector Access and Institutional Strengthening Project which will be implemented by the MoED are summarised below:

- Improved reliability of electricity supply:** The Juba grid densification and extension component will Improve the reliability of the electricity supply to project beneficiaries within Juba such as households, commercial and government installations, IDP camps as well as their host communities. The mini grid project components will Improve the coverage of reliable electricity supply to refugee host communities and camps in Jamjang and Maban, while the Off-grid electrification project components will also improve the health and education facilities to get electrification access. The implementation of these components will decrease the cost of electricity to the beneficiaries who have been relying on diesel powered generators which are expensive to operate and require imported fuel and spare parts; generate high saving from expenditure in alternatives, such as kerosene lamps, candles, diesel generators and batteries.
- Improved access to clean and reliable electricity:** The proposed project will provide clean energy and reduce the use of diesel-powered generators by communities, commercial and public institutions;
- Job Opportunities and Skills development:** The proposed project will create different job opportunities for skilled and unskilled manpower to be engaged in the construction and operation phase of the project. Furthermore, the project presents a good opportunity for skill development and capacity building of manpower that will be directly engaged on the project and associated with clean energy development technology. This will enhance basic skill levels regarding the grid and off grid technology within the energy sector of the country;
- Improved standard of living:** Access to electricity will improve the standard of living of project beneficiaries within project areas, such as households, commercial and government installations, IDP camps as well as their host communities. Project beneficiaries will be able to use domestic

appliances like iron boxes, fridges, television sets, washing machines and other electrical equipment. Use of electricity reduce smoking hazard due to kerosene lamps which predisposes people to respiratory diseases;

- **Improved Security and safety:** lighting enhances the security of community neighbourhoods. This will make streets safer for women and girls. Regarding the enhancement of safety, electricity lighting will replace the traditional sources of light. This will reduce incidences of lighting-induced fire hazards within households as well as reduce indoor air pollution that is caused by smoke from wood fuels that are used for cooking. Additionally, improved night time lighting will help reduce the incidence of wild animal attacks and thefts at night;
- **Benefits to education and health facilities:** Electrification will lead to the Improvement of health and education services in remote areas, especially as these facilities will be able to open for longer or extended hours. Additionally, lighting will facilitate night-time school activities and improve studying conditions of school-age children; electricity will increase access to clean water in health centres and thus reduction in outbreak of diseases.
- **Environmental benefit:** The project will promote the use of renewable energy which is an environmentally friendly source of energy that will reduce air pollution and pressure on natural resources that are being harvested for community biomass consumption to meet energy needs. Additionally, since the project will use concrete poles for power distribution lines instead of the wooden poles, this will reduce the need to fell trees that can then be used as electric poles;
- **Poverty reduction:** Affordable and stable electricity will enable project beneficiaries to be engaged in income generating activities, such as small and medium enterprises. This will improve the economic status of households and businesses through extension of working hours into the night and lowering the cost of doing business;
- **Reduced noise pollution and GHG emissions:** The project will lead to reduced noise pollution and the greenhouse gases that are released from a number of diesel generators that are operated to run businesses; and
- **Strengthening institutional capacity:** Strengthening of the regulatory framework of South Sudan's energy sector and improving efficiencies in the sector, coupled with creating good linkages with the East Africa Power Pool will see a strengthening of institutional capacity at the MoED, SSEC and for all personnel that will be engaged on the project.
- **Strengthening E&S management:** the project will enhance the assessment capacity of E&S impacts and strengthening the management skills of E&S of the South Sudan institutions (MoED, SSEC, MoEF), particularly hazardous waste management skills associated with energy access project.

6.3 Negative Impacts & Mitigation Measures

The South Sudan Energy Sector Access and Institutional Strengthening Project will greatly contribute to the enhancement of electricity access to project beneficiaries. However, despite the benefits that will be associated with the project, adverse/negative impacts could potentially result from the implementation of the different activities of the project. It should be noted that a detailed impact analysis and development of mitigation measures will be undertaken at the Environmental and Social Impact Assessment stage especially for components 1, 2 and 3. For component 4, physical investment is not anticipated and hence no direct E&S risk may result from activities to be financed under this component. However, there are potential downstream risks, which may result from the implementation of the outputs of the technical assistance activities. The potential downstream risks include among others generation of pollutants and health and safety risks. Individually, each solar power generating facility may not have significant environmental risks related to generation of hazardous pollutants. However, the cumulative impacts could be significant. Besides, the activities to be financed by this project may trigger further investment in the energy sector, which can cumulatively account for environmental pollution. The

impacts presented in this chapter were assessed through review of project related literature, and stakeholder consultations that were spearheaded by the MoED in South Sudan.

6.3.1 Adverse impacts of the Juba grid densification & extension

Power distribution and network strengthening in grid densification will mainly involve replacement of wooden poles, cables and re-conductoring. These activities will be undertaken using existing idle transformer(s). Among others, some of the activities during rehabilitation and upgrading of distribution lines are; selective vegetation removal, excavation of new pole sites, removal of timber poles, installation of new concrete poles and removal and replacement of conductors. The adverse impacts that could arise from the implementation of these activities are highlighted below.

A. ENVIRONMENT

1 Terrestrial habitat alteration

a) Selective clearance of vegetation and crops

Construction Phase

This will be undertaken along the RoW, access roads to pole sites, at pole sites and staging areas among others. This impact will likely affect crops, scrub vegetation and to a small extent - mature trees and will result into loss of vegetation cover, soil erosion in cleared areas and displacement of species that use the cleared areas as habitats.

Proposed mitigation measures

- ❖ Land clearance should be restricted to that which is required for the project components to minimize the loss of vegetation;
- ❖ Restrict vehicle movements to and from the project site(s) to the project access road – off-road driving should be prohibited;
- ❖ Site restoration should be undertaken for areas where temporary project infrastructure will be established during the construction phase. The affected areas should be restored and only indigenous vegetation replanted. Intentional restoration using exotic plant species should be avoided; and
- ❖ Sensitize workers against unnecessary destruction, trampling and clearance of flora/crops.
- ❖ In an event that the project activities may have potential adverse impacts on biodiversity, biodiversity management plan should be developed, if the potential risk of project activities are insignificant, the appropriate mitigation measures should be implemented.

Operations and Maintenance Phase

During this phase, natural vegetation such as grass, shrubs and tree branches that are dangerously close to the distribution lines and poles will have to be maintained/trimmed/pruned.

The magnitude and severity of this impact in this phase is negligible.

Decommissioning Phase

If the temporary access roads to pole sites, pole sites and staging areas as well as the transmission line RoW are not adequately restored, this may result into soil erosion, bareness of areas that were previously crop farmland and proliferation of invasive plant species onto the sites.

Proposed Mitigation measures

- ❖ Landscape and plant indigenous plant species on areas that previously hosted access routes, pole sites and staging areas.

b) Avian and Bat Collisions and Electrocutions

Distribution networks are known to be a possible source of bird and bat strikes that get entangled to the lines causing their injury or even instant death. This is especially more significant when large flocks of birds migrate from one point to another and usually get struck by these distribution lines.

Construction Phase

During this phase, birds are not at risk of getting entangled in the power distribution lines since it will only involve replacement of wooden poles, cables and re-conductoring. Hence the potential impact magnitude is considered negligible in this phase. Additionally, the risk of electrocution of birds is expected to be none or minimal since it is expected that the distribution powerline will be insulated.

Proposed mitigation measures

- ❖ Transmission line corridors should be aligned corridors to avoid critical habitats (e.g., nesting grounds, heronries, rookeries, bat foraging corridors, and migration corridors);
- ❖ Maintaining 1.5-meter spacing between energised components and grounded hardware or, where spacing is not feasible, covering energised parts and hardware;
- ❖ Retrofitting existing transmission or distribution systems by installing elevated perches, insulating jumper loops, placing obstructive perch deterrents (e.g., insulated "V's"), changing the location of conductors, etc.; and
- ❖ Where necessary, Installing visibility enhancement objects such as marker balls, bird deterrents, or diverters.
- ❖ Considering the proposed project where the powerline is insulated, this risk of electrocution expected to be none or minimal and no power line is pass through any known migratory bird routes.

Operations and Maintenance Phase

The impact magnitude of Potential Bird Strikes/Collusions and Electrocution along the distribution lines has significant risk during the operations phases.

Proposed mitigation measures

- ❖ Transmission line corridors should be aligned corridors to avoid critical habitats (e.g., nesting grounds, heronries, rookeries, bat foraging corridors, and migration corridors);
- ❖ Maintaining 1.5-meter spacing between energized components and grounded hardware or, where spacing is not feasible, covering energized parts and hardware;
- ❖ Retrofitting existing transmission or distribution systems by installing elevated perches, insulating jumper loops, placing obstructive perch deterrents (e.g., insulated "V's"), changing the location of conductors, etc.;
- ❖ Where necessary, Installing visibility enhancement objects such as marker balls, bird deterrents, or diverters.
- ❖ Considering the proposed project where the powerline is insulated, this risk of electrocution expected to be none or minimal and no power line is pass through any known migratory bird routes.
- ❖ Demarcation and avoidance of areas of conservation of interest (high value, species, feeding or breeding sites, migration routes);
- ❖ Making power lines present less of an obstacle for birds to collide with and high-visibility markers should be installed to make the lines more visible to birds;
- ❖ To mitigate habitat disturbance and alteration as much as possible the size of the area to be cleared and used for the project should be minimized.
- ❖ Conducting bird mortality monitoring for further management of bird strikes and /collusions.

Decommissioning Phase

The impact is negligible during this phase.

c) Introduction of invasive species

Construction Phase

Invasive plant species may be introduced in the area as a result of implementation of the proposed project activities. Construction equipment that is not properly cleaned and sterilized has the potential to transport seeds and propagules of invasive species from other parts of South Sudan/or from outside South Sudan to the project work sites. The use of soil obtained from outside the project area, for restoration of scarred areas as well as failure to restore scarred areas, and use of exotic plant species for revegetation in areas that were stripped of vegetation, all promote the proliferation of invasive species which can displace desirable species and crops.

Proposed mitigation measures

- ❖ Potential sources of soil should first be inspected for the presence of invasive species and if any are found, these sources should not be excavated; and
- ❖ Invasive species should be monitored for sprout and if they appear along the access road or at the project site, they should be recorded and managed according to a prepared Invasive Species Management Plan; and
- ❖ Undertake revegetation of scarred project areas by using indigenous plant species that are preferably sourced from the immediate vicinity of the project area.

Operations and Maintenance Phase

Disturbances that facilitate the spread of invasive species will generally be infrequent or minimal during this phase. It is assumed that no soil will be needed during operations as is the case for the construction phase above and neither will there be any revegetation undertaken for scarred areas in this phase. Introduction/facilitation of the spread of invasive species is therefore considered non-significant during the operations phase and has therefore not been assessed further.

Decommissioning Phase

The change in activity and site conditions following project closure are likely to present an opportunity for the invasive plant species to blossom. Land will be left bare following the disassembling of project components and as such, present favorable conditions and new areas for the invasive species to colonise.

Proposed Mitigation measures

- ❖ Invasive species can be monitored for sprout and if they appear along the access road or at the project site they will be recorded and managed according to the Invasive Species Management Plan of the Project.
- ❖ Care should be taken to ensure all equipment is properly cleaned to avoid introduction of invasive species at project site from trucks, and other equipment used during this phase.

d) Soil erosion

Construction Phase

Site preparation activities may include selective clearance of vegetation within the footprint of the down areas, access road to the pole, and transmission line i.e., grubbing and scraping and general levelling of the whole site area. These activities may result in the stripping of vegetation and topsoil, which will need to be stockpiled, backfilled and/or spread on site. This can loosen the ground due to removal of plant roots and expose the ground to agents of erosion. Compaction of the ground will also result in accelerated rates of storm water runoff which directly increases the rate of soil erosion.

Proposed mitigation measures

- ❖ Site preparation should be undertaken in a systematic manner to reduce the risk of open ground to erosion;

- ❖ There should be controlled clearance of vegetation and this should be limited to only sections that are required for the establishment of project infrastructure;
- ❖ An efficient drainage system should be incorporated in the project design to cater for efficient and effective drainage of storm water from the project site and along the access road;
- ❖ Where possible, construction activities should not take place during heavy rain seasons;
- ❖ Disturbed areas should be rehabilitated using suitable indigenous cover grasses; and
- ❖ Landscaping of affected areas should be undertaken following completion of the construction phase to stabilize surfaces.

Operations and Maintenance Phase

Disturbances that facilitate the occurrence of soil erosion are generally minimal during this phase of the project. However, the drainage system and other mitigation measures as listed in the construction phase above will need to be monitored and maintained to ensure continuous storm water management and effectiveness especially around the electric poles.

Decommissioning Phase

During this phase of the project, the project site will be restored to as near to its original state as possible before implementation of project activities. Excavation, levelling and other earthworks may disturb the soil due to the removal of introduced soils.

Proposed Mitigation measures

- ❖ Reinstall soils and original drainage patterns of the area;
- ❖ Re-vegetate any areas used temporarily during construction; and
- ❖ No non-native species should be planted on-site.

e) Soil compaction and loss of soil functioning

Construction Phase

Soil compaction will result from earthmoving activities such as site clearance, excavation and the use of soil compactor machines. Movements of equipment, vehicles and delivery trucks are also likely to result in soil compaction along the footprint of the access road to the sites. Soil compaction alters soil physical and chemical properties by reducing the composition of air, reducing the rate of infiltration and formation of a hard pan which increases soil resistance to root penetration. As a result, productivity of the soil decreases, hence loss of soil functioning.

Proposed mitigation measures

- ❖ Limit the project activities to the footprint of the required project area;
- ❖ Utilize vehicles with wide tires to minimize pressure exerted onto the ground;
- ❖ Prohibit off-road driving and parking outside of designated parking area;
- ❖ Stockpile the surface soil on the side of the project site for future use in landscaping; and
- ❖ Upon completion of work, the soil in any affected areas should be scarified to alleviate the effects of compaction.

Operations and Maintenance Phase

During the operations phase, only light vehicles will be utilized for operation and maintenance of the distribution power lines and poles. These will be restricted to the project access road. The extent of compaction likely to be caused is considered negligible.

Decommissioning Phase

Movement of decommissioning equipment, vehicles and trucks at the site are likely to result in soil compaction.

Proposed Mitigation measures

- ❖ Driving outside the designated working areas should be prohibited to prevent soil compaction and habitat disturbance or destruction; and
- ❖ Upon completion of work, the soil in any affected areas should be scarified to alleviate the effects of compaction.

f) Soil contamination

Construction Phase

Biodegradable and non-biodegradable wastes will be generated during the construction phase. These will include; stones, sand, steel (metallic bars), insulators and other construction materials. Plastic wastes such as; mineral water bottles, polythene bags, jerry cans, and other plastic accessories may be generated at the work centers. Organic wastes such as food stuff and human waste will also be generated at the work centers.

Oil and fuel leaks might occur from vehicles, equipment and machinery used during construction. These wastes, if not well managed, have the potential to contaminate the surrounding soil and alter both its chemical and physical properties thus affecting its productivity.

Proposed mitigation measures

- ❖ All wastes generated during construction activities should be collected and disposed of appropriately at designated sites;
- ❖ Undertake monitoring of the soil quality and devise corrective action when changes attributed to project implementation have been observed;
- ❖ The waste management hierarchy should be followed during the construction phase. According to this hierarchy, source reduction of waste will be the first option and disposal of unavoidable waste as the option of the last resort;
- ❖ Undertake routine preventive maintenance of motorized equipment to avoid any fuel leakage and spills; and
- ❖ Storage of fuels and oils should be undertaken in a manner that does not allow leakage to the soil as the fuel can readily infiltrate the soils polluting the soils, ground and surface water.

Operations and Maintenance Phase

Activities that facilitate the occurrence of this impact in this phase are generally negligible.

Decommissioning Phase

The cause of the impact in this phase, is similar to that described for the construction phase. In addition, accidental release of potentially contaminative solids, spillage and/or sewage may impact soil resources via dissolution or suspended transport, with consequences for human and faunal health.

Proposed Mitigation measures

- ❖ All organic waste generated at the project site such as food waste should be collected and managed responsibly;
- ❖ Undertake monitoring of the soil quality and devise corrective action when changes attributed to project implementation have been observed;
- ❖ Motorized equipment will undergo routine preventive maintenance of avoid any fuel leakage and spills; and
- ❖ All waste generated from decommissioning activities will be collected and disposed of in accordance with South Sudan's laws pertaining to waste disposal and management, the World Bank ESF requirements and international best practice.

2 Aquatic/terrestrial habitat alteration

Construction Phase

Power transmission and distribution lines, and associated access roads and facilities, may require construction of corridors crossing aquatic/terrestrial habitats that may disrupt watercourses and wetlands,

and require the removal of riparian vegetation. In addition, sediment and erosion from construction activities and storm water runoff may increase turbidity of surface watercourses.

Proposed mitigation measures

- ❖ Site power transmission poles and substations to avoid critical aquatic habitat (e.g., watercourses and wetlands; and
- ❖ Minimize the clearing and disruption of riparian vegetation.

Operations and Maintenance Phase

Activities that facilitate the occurrence of this impact in this phase are generally negligible.

Decommissioning Phase

Activities that facilitate the occurrence of this impact in this phase are generally negligible. However, care must be taken to dispose wastes from the decommissioning process into aquatic habitats.

Proposed Mitigation measures

Ensure that waste disposal does not occur in aquatic habitats.

3 Electric and Magnetic Fields (EMF) Impacts

Construction Phase

Electric and magnetic fields (EMF) are invisible lines of force emitted by and surrounding any electrical device (e.g., power lines and electrical equipment). This impact is not expected to occur during the construction phase since the powerlines and substations will not be energised at this stage.

Operations and Maintenance Phase

Electric fields are produced by voltage and increase in strength as the voltage increases. There is public and scientific concern over the potential health effects associated with exposure to EMF (e.g., from high voltage power lines and substations). As a matter of precaution, the following mitigation measures should be undertaken.

Proposed mitigation measures

- ❖ Evaluate potential exposure to the public against the reference levels developed by the International Commission on Non-Ionizing Radiation Protection (ICNIRP)^{15,16}. Average and peak exposure levels should remain below the ICNIRP recommendation for General Public Exposure¹⁷;
- ❖ Consider siting new facilities so as to avoid or minimize exposure to the public. Installation of transmission lines or other high voltage equipment above or adjacent to residential properties or other locations intended for highly frequent human occupancy, (e.g., schools or offices), should be avoided; and
- ❖ If EMF levels are confirmed or expected to be above the recommended exposure limits, application of engineering techniques should be considered to reduce the EMF produced by power lines, substations, or transformers. Examples of these techniques include:
 - Shielding with specific metal alloys;
 - Increasing height of transmission towers; and

¹⁵ ICNIRP is a non-governmental organization formally recognized by the World Health Organization (WHO), which published the "Guidelines for Limiting Exposure to Time-varying Electric, Magnetic, and Electromagnetic Fields" following reviews of all the peer-reviewed scientific literature, including thermal and non-thermal effects. The standards are based on evaluations of biological effects that have been established to have health consequences. The main conclusion from the WHO reviews is that exposures below the limits recommended by the ICNIRP international guidelines do not appear to have any known consequence on health.

¹⁶ An additional source of information is the Institute of Electrical and Electronics Engineers. See IEEE (2005).

¹⁷ The ICNIRP exposure guidelines for General Public Exposure are listed in Section 2.1 of the EHS Guidelines for Electric Power Transmission and Distribution.

- Modifications to size, spacing, and configuration of conductors

Decommissioning Phase

This impact is not expected to occur during this phase of the project since the powerlines will be deenergized and workers will not be exposed to EMF thus the impact in this phase is negligible.

4 Hazardous materials and Waste

a) Spillage and leakages

Construction Phase

During this phase, there will be movement and maintenance of project vehicles and transportation of electrical components such as transformers and conductors that contain hazardous fluids. There is a possibility of leakages of fuels, and lubricants such as vehicle hydraulics and transformer oil, Polychlorinated biphenyls (PCBs) among others, that could be harmful to the exposed environment.

Proposed mitigation measures

- ❖ Ensure that all transformers are placed on drip trays during transportation, prior to and after installation;
- ❖ Prepare and implement an Oil Spill Response Plan;
- ❖ Prepare and implement an Emergency Preparedness and Response Plan;
- ❖ Vehicle maintenance and servicing should be done only on purpose-built impervious concrete platforms with oil and grease traps;
- ❖ Undertake vehicle inspection using a pre-developed vehicle inspection checklist for all project vehicles;
- ❖ Ensure that there is a gazetted washing area for all project vehicles;
- ❖ Ensure that all project vehicles are maintained in good condition;
- ❖ Train project staff in the management of spills; and
- ❖ Establish secondary containment for any spills for the gazetted parking area of project vehicles.

Operations and Maintenance Phase

Activities that facilitate the occurrence of this impact in this phase are generally negligible. However, monitoring should be undertaken at substations and transformer areas.

Decommissioning Phase

PCBs used to be widely used as insulators in electrical equipment, including transformers, capacitors, switches, voltage regulators etc. They are of concern because they are powerful toxins, even at low concentrations, and they persist and bio-accumulate in the environment creating adverse health impacts and adverse ecological changes. Sulphur hexafluoride, or SF₆, is widely used in the electrical industry to prevent short circuits and accidents. The non-flammable, SF₆ is a colorless, odorless, synthetic gas. It makes a hugely effective insulating material for medium and high-voltage electrical installations. SF₆ currently plays a key role as an insulating and arc-quenching medium, particularly in switchgear. In addition to its many advantages in terms of technical properties, SF₆ has the disadvantage of having a very high global warming potential (GWP). It is the most potent greenhouse gas known.

Proposed Mitigation measures

- ❖ Analyze the type of gases present in the transformers and other insulated equipment associated with PCB and SF₆;
- ❖ Refurbishment of any substations and upgrading/rehabilitation work of the power line will need to check whether any such old transformers/equipment will be replaced, and appropriate safeguards (appropriate storage, decontamination, and disposal of contaminated units), taken;
- ❖ Prior to final disposal, retired transformers and equipment containing PCB should be stored on a concrete pad with curbs sufficient to contain the liquid contents of these containers should they be spilled or leaked;

- ❖ Contract a licensed hazardous waste handler to safely transport and dispose of hazardous waste containing PCB;
- ❖ Surrounding soil exposed to PCB leakage from retired equipment should be assessed, and appropriate removal and/or remediation measures should be implemented;
- ❖ The project should consider use of alternative vacuum circuit breaker technologies; and
- ❖ The project should consider use of alternative fluorinated gas mixtures if possible.

b) The use of Wood Preservatives

Construction Phase

The impact related to this aspect is not expected to occur in this phase of the project since concrete and not wooden treated poles will be used.

Operations and Maintenance Phase

Activities that facilitate the occurrence of this impact in this phase are generally negligible.

Decommissioning Phase

The power distribution and network strengthening in grid densification project will mainly involve replacement of wooden poles and the installation of new concrete poles. Majority of wooden utility poles are treated with pesticide preservatives to protect against insects, bacteria, and fungi, and to prevent rot. The preservatives most commonly used for power poles are oil-based pesticides such as creosote, pentachlorophenol (PCP), and chromated copper arsenate (CCA) that could be harmful to the exposed environment. Activities related to replacement of electric poles, are relevant to the decommissioning phase of the project and have been discussed there under.

Proposed Mitigation measures

- ❖ Undertake appropriate disposal of used wooden poles that will be removed and replaced with concrete poles. Landfill facilities should be capable of handling wastes that may have chemical leaching properties. Disposal through incineration or through recycling should consider associated air emissions and secondary product residues of preservative chemicals;

c) Waste Management

Construction Phase

It is anticipated that different types of wastes will be generated during the extension of power distribution and transmission line networks. These include solid and liquid waste, spoils soils, scrap metals, cables, capacitor, wood, glass, packaging materials as well as hazardous wastes such as polychlorinated biphenyls (PCBs) from older imported transformers and capacitors, transformer parts & oils, fluorescent bulbs and a certain number of heavy metals (chromium, copper and arsenic). Unmanaged disposal and inadequate waste management could affect public health, land and water resource. Since South Sudan lacks the necessary infrastructure to deal with such waste effectively, proper handling of waste following international waste management strategy, particularly World Bank guideline requires to be applied.

Proposed Mitigation measures

- ❖ Develop a Waste Management Plan prior to the commencement of the project;
- ❖ Non-hazardous metals and cables could be sold to authorized collectors and recyclers
- ❖ As there are no known facilities to dispose of hazardous waste in the country. The Contractor should consider designing a temporary hazardous waste storage facility in consideration of the generated amounts and timing before final disposal by licensed hazardous waste handlers in accordance with the national legislative requirements and world Bank ESF requirements and GIIP practices;
- ❖ Maximize the re-use of all excavated materials in the construction works.
- ❖ Disposal of surplus material (spoil) only at designated sites approved by the responsible local authority and only by approved methods.

- ❖ No spoil should be disposed of in wetlands, near watercourses and other important habitats
- ❖ Contract a licensed hazardous waste handler to safely transport and dispose of hazardous waste;
- ❖ Capacitate and support licensed personnel who are involved in hazardous waste disposal and management in all aspects including financial and technical supports.
- ❖ Identify the potential waste streams to be generated by the project activities, and how best they can be managed;
- ❖ All wastes shall be properly disposed of in accordance with the national legislative requirements and in accordance with ESF requirements and GIIP practices;
- ❖ Proper waste segregation, safe transport, and disposal at the authorized designated waste disposal.
- ❖ Ensure that there are ablution facilities along at each point of the project. This could be in form of mobile toilets or establishing an understanding to use the facilities owned by the project host communities;
- ❖ Provide adequate waste collection bins at each point of work to facilitate the segregation of waste; and
- ❖ Ensure that project personnel are trained in key aspects of waste management such as the waste management hierarchy and conduct regular awareness creation, training and sensitization for the project proponent, workers and community reside in the area on the potential negative impacts, health and safety risks, of solid wastes, proposer waste management practices, and processes.

Operations and Maintenance Phase

Due to the limited project activities and the reduced labor force, it is envisaged that waste to be generated during the operations phase will be negligible at the sites.

Decommissioning Phase

During decommissioning, a lot of waste such as electric wires, transformers, and electric poles, among other waste streams will be generated. If not properly managed, the waste will be left within the communities and result in pollution of the air, water, and the environment.

Proposed Mitigation measures

- ❖ In addition to the mitigation measures already discussed during the construction phase, the project developer should have a decommissioning plan in place that addresses aspects of waste management.

5 Noise and vibrations effects

Construction Phase

Construction activities such as line clearance, excavations, compaction at pole spots, and vehicles transporting materials, equipment, and workers. The construction activities typically, result in temporary and short-term duration increases in the noise levels, particularly during day time when activities tend to be at their peak.

The sensitive receptors of the noise and vibrations could be schools, health centers, and residential areas located within the vicinity of the project alignment.

Proposed mitigation measures

- ❖ Excessive noise levels should be restricted to the daytime and working hours, and equipment producing high levels of noise should be avoided when working within proximity to any sensitive noise receptors;
- ❖ Ensure that equipment and vehicles when not in use, are switched off to avoid noise emission;
- ❖ If particularly noisy works are scheduled, the nearest sensitive receptors will need to be informed of the timing and duration of the nuisance.

- ❖ Where possible, noise barriers should be employed to ensure that the maximum noise level at a 1m distance from a single source will not exceed nationally accepted permissible levels and World Bank's Environmental and Social Framework (ESF) requirements.

Operations and Maintenance Phase

Noise will be generated from vehicles used for the transportation of workers who will periodically undertake maintenance works along the transmission line RoW; however, this is unlikely to be significant due to the small number of vehicles and workers involved.

Additionally, noise in the form of buzzing or humming can often be heard around transformers. This low pitch persistent noise can be troubling to nearby residents.

Proposed Mitigation measures

- ❖ Locate transformers away from human receptors to the extent possible; and
- ❖ Apply noise barriers or noise-cancelling acoustic devices on the transformers.

Decommissioning Phase

The decommissioning and site restoration process will generate noise since heavy machinery will be required and metal structures may need to be disassembled. However, this will be temporary and impact of minor magnitude.

6 Alteration of ambient air quality

Construction Phase

There will be vehicular movement transporting materials and workers in this phase of the project. Additionally, there could be small scale land/vegetation clearance especially in areas where associated facilities are to be set up. These activities will lead to the generation of dust which affects human health. Additionally, the use of generators will also lead to emission of smoke and pollution of air.

Proposed mitigation measures

- ❖ Undertake dust control and suppression measures including the regular application of water on or near construction sites, settlement areas to reduce dust generation and observing traffic speed limits.
- ❖ Maintain all machinery and equipment in good working order to ensure minimum emissions.
- ❖ Install humps along the project roads as well as haulage routes to reduce the speed of trucks.
- ❖ Prohibit the burning of garbage in the workers' camp and along the roads; and
- ❖ Undertake timely servicing of vehicles so as to control the emission of gases from vehicles and equipment.

Operations and Maintenance Phase

The impact of project activities on air quality during this phase, is insignificant because the minigrids, standalone solar power facilities and the Juba grid will not produce air emissions.

Decommissioning Phase

The cause of this impact during the decommissioning phase is the same as that described for the construction phase above only that in this case, impacts on air quality levels will be from the disassembling of associated metal structures and their associated transportation along the access roads.

Proposed Mitigation measures

- ❖ Make all reasonable efforts to suppress dust during earthworks. Specific actions may include continually watering dusty construction areas with a water bowser;
- ❖ Installation of humps along the project roads as well as haulage routes to reduce the speed of trucks; and

- ❖ Burning of garbage and any resultant waste in the workers' camp and along the roads should be prohibited. The waste should instead be responsibly disposed of.
- ❖ Alteration of ambient air quality due to gaseous emissions

B. OCCUPATIONAL HEALTH AND SAFETY

1 Working at height on Poles

Construction Phase

Workers may be exposed to occupational hazards when working at elevations during the construction phase which entails accessing the highest points of electric poles in order to connect the conducting wires.

Proposed mitigation measures

- ❖ The project should have Environment, Health and Safety roles assigned to trained personnel;
- ❖ The project should have an Occupational Health and Safety Plan;
- ❖ Conducting Job risk assessments and instituting permit to work provisions for activities that are undertaken at a height;
- ❖ Activities at a height should only be undertaken by well trained personnel;
- ❖ Testing structures for integrity prior to undertaking work;
- ❖ Implementation of a fall protection program that includes training in climbing techniques and use of fall protection measures; inspection, maintenance, and replacement of fall protection equipment; and rescue of fall-arrested workers, among others;
- ❖ Hoisting equipment should be properly rated and maintained and hoist operators properly trained; and
- ❖ An approved tool bag should be used for raising or lowering tools or materials to workers on structures.

Operations and Maintenance Phase

Workers may be exposed to occupational hazards when working at elevations during the maintenance of conducting wires and components of the grid that are located at a height.

Proposed Mitigation measures

- ❖ Conducting Job risk assessments and instituting permit to work provisions for activities that are undertaken at a height;
- ❖ Testing structures for integrity prior to undertaking work; and
- ❖ Maintenance activities at a height should only be undertaken by trained personnel;

Decommissioning Phase

The impact of this aspect in this phase is negligible. However, should it be necessary to work at height, the measures as suggested for the construction phase will apply to this phase too.

Proposed Mitigation measures

- ❖ Conducting Job risk assessments and instituting permit to work provisions for activities that are undertaken at a height.

2 Exposure to Polychlorinated biphenyls (PCBs) and SF6 Impacts

Decommissioning Phase

PCBs used to be widely used as insulators in electrical equipment, including transformers, capacitors, switches, voltage regulators etc. They are of concern because they are powerful toxins, even at low

concentrations, and they persist and bio-accumulate in the environment creating adverse health impacts and adverse ecological changes. Sulphur hexafluoride, or SF₆, is widely used in the electrical industry to prevent short circuits and accidents. The non-flammable, SF₆ is a colorless, odorless, synthetic gas. It makes a hugely effective insulating material for medium and high-voltage electrical installations. SF₆ currently plays a key role as an insulating and arc-quenching medium, particularly in switchgear. In addition to its many advantages in terms of technical properties, SF₆ has the disadvantage of having a very high global warming potential (GWP). It is the most potent greenhouse gas known.

Proposed mitigation measures

- ❖ Analyse the type of gases present in the transformers and other insulated equipment associated with PCB and SF₆.
- ❖ Refurbishment of any substations and upgrading/rehabilitation work of the power line will need to check whether any such old transformers/equipment will be replaced, and appropriate safeguards (appropriate storage, decontamination, and disposal of contaminated units) taken.
- ❖ Prior to final disposal, retired transformers and equipment containing PCB should be stored on a concrete pad with curbs sufficient to contain the liquid contents of these containers should they be spilled or leaked.
- ❖ Contract a licensed hazardous waste handler to safely transport and dispose of hazardous waste containing PCB;
- ❖ Surrounding soil exposed to PCB leakage from retired equipment should be assessed, and appropriate removal and/or remediation measures should be implemented
- ❖ The project should use alternative vacuum circuit breaker technologies; and
- ❖ The project should use alternative fluorinated gas mixtures if possible.

3 Other Occupational Health and Safety Risks

Construction activities like power distribution activities could pose potential risks to the health and safety of project construction work forces. These risks include those associated during operation of project machinery, vehicles, plant, and equipment. Freak accidents may occur which can result in injury and fatalities.

Generally, workers on construction sites are highly exposed to injuries, falls, fatalities caused by machinery and/or transport, struck by falling object and risks from manual handling of heavy loads.

Uncontrolled growth of tall trees or vegetation within the transmission RoW may aggravate and cause an increased risk of electrocution, due to contact of branches and trees with live distribution lines which creates, ignition of forest and brush fires that ultimately danger to workers who are on duty.

Generally, workplaces and health and safety risks include:

- ❖ Electrocution hazard during installation and maintenance of power distribution lines;
- ❖ Injury from falls from falling objects;
- ❖ Injury or fatality from heavy construction equipment;
- ❖ Improper use and lack of availability of the required Personal Protective Equipment (PPE); and
- ❖ Injury during excavation for mini grid structure, tower erection, etc.

Proposed Mitigation Measures

Specifically, to avoid these safety hazards and risks, the following general safety measures need to be considered during the project implementation period.

- ❖ Ensure the availability and proper use of PPE by the contractors, laborer who are engaged in the construction, installation and operation and maintenance of the proposed project;
- ❖ Monitor regularly the use and availability of PPE and other protective tools and materials by the project coordination unit at all phases of the project;

- ❖ All workers entering the construction site must be equipped with PPE including goggles, safety shoes, overalls, gloves, dust masks, among others. The PPE should be those that follow the international standards of PPE;
- ❖ ONLY competent workers and staff should be allowed to operate any machinery and equipment to reduce the incidents of accidents.
- ❖ During the construction phase, the project site should be completely sealed off and warning signs erected informing the public to keep off the construction site when construction is in progress;
- ❖ Personal protection gear applicable to the activities must be provided and its use made compulsory to all;
- ❖ Fire risks are possible due to improper storage facilities and lack of fire drill, and this requires provision of regular training and awareness creation to the workers;
- ❖ For any incidents of leakage or spill during installation, temporary containment structure is required to clean-up accidental spills;
- ❖ Provide regular OHS induction training for staffs before mobilization to work;
- ❖ Personal protection gear will be provided, and its use made compulsory to all. The entire workforce should be trained in the use of protective gear, handling of chemical products and acid storage cells, electric safety equipment, procedures for entering enclosed areas, fire protection and prevention, emergency response and care procedures;
- ❖ Training given to the employees should be backed by regular on- site training in safety measures;
- ❖ Machines and Equipment must be operated only by qualified staff and a site supervisor should be on site at all times to ensure adherence;
- ❖ The contractor must develop workers' Health and Safety Manual for which all the workers should be conversant with for response in case of accidents; and
- ❖ Cut trees to a height shall be as per the national standards, limit the ROW at the recommended width for both 33 kV and 15 kV. However, the undergrowth in the ROW should be allowed while only leaving a narrow strip to be completely cleared to allow stringing of the line conductors.

4 Traffic Impact

Construction phase

The activities of the project during the construction phase triggers certain issues about potential traffic accidents. An increased movement of vehicles could lead to potential impacts on the project workers and livestock of the local communities and the communities as well.

Proposed Mitigation measures

- ❖ Use speed control devices to control the speed of vehicles;
- ❖ Periodic supervision of the management of vehicle movement to access tower foundations should be done;
- ❖ Provide awareness training for drivers and workers;
- ❖ Improving driving skills and requiring licensing of drivers; and
- ❖ Adopting limits for trip duration and arranging driver rosters to avoid overtiredness.

Operation and maintenance phase

The traffic impacts are expected due to the vehicle transportation.

Proposed mitigation measures

The mitigation measures for the operation phase are the same as those described for the construction phase above.

Decommissioning phase

The movement of vehicle during decommissioning phase also occurs.

Proposed mitigation measures

The mitigation measures for the decommissioning phase are the same as those described for the construction phase above. However, the traffic safety management plan for decommissioning phase should be prepared and considered.

C. COMMUNITY HEALTH AND SAFETY

1 Electrocution

Construction Phase

This impact may occur during the installation of power distribution lines. However, if care is taken to ensure that the lines are always de-energised during works on them, this risk can be reduced to As low as reasonably practicable.

Operations and Maintenance Phase

Activities during this phase will entail maintenance/trimming/pruning of the vegetation or trees near the electric poles or those that are within the transmission lines' RoW. This phase will also entail undertaking works on faulty power lines.

Proposed Mitigation measures

- ❖ Undertake risk assessments for powerlines that have been reported to be faulty;
- ❖ Assign works on faulty powerlines to competent personnel;
- ❖ Sensitize community members to avoid illegal connections to the grid. Additionally, information should be provided to communities to report any cases of fallen electric wires to the responsible authorities; and
- ❖ Issue the right PPE to personnel that will be tasked with works on faulty powerlines.

Decommissioning Phase

The impact of this risk in this phase is negligible.

2 Landscape and Visual Impact

Construction Phase

There are expected visual landscape changes due to land clearance, increase in the number of vehicles in the project sites and erection of concrete poles and presence of transmission lines in the neighborhoods of Juba. Visual resources (visual characteristics of a place which include both natural and man-made attributes) are very important to people living in the area and people going through an area. The installation of more transmission lines is likely to affect the visual amenity of Juba City.

Proposed mitigation measures

- ❖ Create community awareness on issues related to the project activities;
- ❖ Liaise with community members to ensure that access to the sites is restricted for the duration of the construction and installation of the transmission lines;
- ❖ All construction activities should be limited to the required project footprint;
- ❖ Journey management should be undertaken in order to ensure that only the necessary trips required for the construction activities are made; and
- ❖ Undertake landscaping of the project site and restoration of affected area following completion of the construction phase.

Operations and Maintenance Phase

The impact of this risk in this phase is negligible.

Decommissioning Phase

The decommissioning phase for this component of the project will include but not be limited to the following activities; Construction equipment dismantling, demolishing, fence removal, excavation and back filling. Whereas the temporary facilities are expected to be decommissioned, the electricity grid is expected to be a long-term project.

Proposed Mitigation measures

- ❖ Create community awareness on the related issues prior to decommissioning of temporary facilities;
- ❖ Liaise with community members to ensure that access to the project site is restricted for the duration of decommissioning until the site is restored close to its original state; and
- ❖ Limit the decommissioning activities to the project foot print; and
- ❖ Undertake re-vegetation in decommissioned areas.

3 Noise and Ozone

Transformers may generate noise in the form of buzzing or humming and this noise can often be heard around transformers or high voltage power lines producing corona. Ozone, a colorless gas with a pungent odor, may also be produced. The acoustic noise produced by transmission lines is greater with high voltage power lines (400-800 kilo volts [kV]) and even greater with ultra-high voltage lines (1000 kV and higher), Noise from transmission lines reaches its maximum during periods of precipitation, including rain, sleet, snow or hail, or as the result of fog.

Proposed Mitigation Measures

- ❖ Locate rights-of-way away from human receptors to the extent possible is a good mitigation measures at project planning stages; and
- ❖ Use of noise barriers or noise canceling acoustic devices should be considered as necessary.

4 Aircraft Navigation Safety

Construction Phase

The impacts associated with aircraft navigation safety at the construction phase is negligible.

Operations and Maintenance Phase

The impacts associated with aircraft navigation safety at the operations and maintenance phase is negligible.

Decommissioning Phase

A power transmission tower of the proposed project located near an airport or known flight paths, can impact aircraft safety directly through collision or indirectly through radar interference.

Proposed Mitigation measures

- ❖ Consider aircraft navigation impact during the planning stage of power transmission tower;
- ❖ Avoiding the siting of transmission lines and towers close to airports and outside of known flight path envelopes;
- ❖ Consultation with regulatory air traffic authorities prior to installation;
- ❖ Adherence to regional or national air traffic safety regulations;
- ❖ Use of buried lines when installation is required in flight sensitive areas.

5 Soil, groundwater, and surface water drainage

Construction Phase

The use of construction machinery may degrade soils and modify local drainage flows through a combination of compaction and physical disturbance, creating trenches along tire tracks, and from excavations and stockpiling material. This could result in the turbidity of the nearby surface water receptors.

Oil/fuel/lubricant leaks and spills from the use of construction machinery, and refueling activities have the potential to result in localized soil and groundwater pollution.

Effluent will be generated from the operation of the base camp where workers will be present. Blackwater, grey water, and kitchen water will be generated within the Project Site.

Proposed mitigation measures

- ❖ Place clear markers indicating stockpiling areas of excavated materials to restrict equipment and personnel movement, thus limiting the physical disturbance to land and soils in adjacent areas;
- ❖ Undertake routine maintenance of motorized equipment to avoid any fuel leakage and spills;
- ❖ Storage of fuels and oils should be undertaken in a manner that does not allow leakage to the soil as the fuel can readily infiltrate the soil polluting the soil, ground, and surface water; and
- ❖ All waste generated from project activities should be collected and disposed of following the relevant national laws and international industry best practices.

Operations and Maintenance Phase

Impacts associated with soil, surface and groundwater are minimal during the operation phase of the project.

Decommissioning Phase

The impact of project activities on soil, groundwater and surface water drainage is considered negligible in this phase since the installation activities here are expected to be short-lived. None the less, the mitigation measures below have been suggested.

Proposed Mitigation measures

- ❖ Sensitize drivers to keep vehicles on defined tracks; and
- ❖ Undertake rehabilitation of excavated areas/formerly cleared sites/areas.

6 Increased traffic

Construction Phase

Typical civil engineering construction equipment will need to be brought to the site (e.g., excavators, trucks, graders, compaction equipment, cranes, etc.) as well as poles and transmission wires/conductors. This equipment will be transported to the site using national, provincial, and local roads. Haulage of construction materials will result in increased traffic on the existing roads. Increased traffic and transportation of heavy loads may damage the existing roads leaving them in a worse state, and there are secondary impacts upon air quality (in terms of both dust and air emissions), and noise, particularly in the vicinity of the site and along the access road. The increased volume of traffic to the sites may also increase the potential for accidents especially along the roads in the community leading to and from the proposed project sites where poles will be planted.

Proposed mitigation measures

- ❖ Travel in convoys and at designated times to decrease and avoid peak travel/ movement times within Juba City;
- ❖ Journey-specific risk assessments which will include the identification of potentially sensitive receptors along the traffic routes should be conducted. For significant traffic movements, including transport of construction materials to site, any affected communities/residents along the route should be

sensitized, and wherever possible, attempts made to undertake the traffic movements at the least busy times of day;

- ❖ When travelling in community areas, speed limits on transportation routes should be maintained at 40km/hr for light vehicles and 30km/hr for heavy vehicles;
- ❖ Only approved drivers should be allowed to operate vehicles;
- ❖ Construction materials should wherever possible, be preferentially sourced locally in a manner that reduces environmental and social impacts (e.g., transport distances) and maximizes local economic development opportunities;
- ❖ All roads should have clear and visible signage especially in community areas, around schools and hospitals to minimize the risk of accidents;
- ❖ Each road junction near the project sites should have a traffic controller or signal person to monitor and direct traffic flow;
- ❖ All staff should undergo an Environment, Health and Safety induction process which includes rules for safe driving, including speed limits in community areas; and
- ❖ Construction equipment should be maintained on site until the construction is complete to reduce on vehicle movement (Taking into consideration, their security).

Operations and Maintenance Phase

Operation and maintenance crew vehicles will contribute to increase of traffic flow in the area associated with O&M staff commutes. These commutes however, are expected to be infrequent and mostly responsive to alerts about defects on the distribution lines. This impact is therefore considered insignificant during the operations phase and has therefore not been assessed further.

Decommissioning Phase

During the implementation of decommissioning phase, traffic in the area will increase as a result of project related vehicular movements associated with the offsite transportation of the decommissioned equipment and debris from dismantled surfaces. Furthermore, increased traffic and transportation of heavy decommissioned loads may damage the existing roads leaving them in a worse state.

Proposed Mitigation measures

The mitigation measures for the decommissioning phase are the same as those described for the construction phase above.

D. SOCIAL ASPECTS

1 Conflict between Local and Migrant Workers

Construction Phase

The power distribution, off-grid, and mini-grid projects will create job opportunities for skilled and unskilled labourers during the construction phase of the project resulting in the immigration of workers to the project site. This could potentially lead to conflict between the local community and workers that do not originate/reside in the project area. Additionally, compensation of Project Affected Persons (PAPs) could increase conflicts between women and men, resulting into increased cases of domestic violence. Unfair employment processes and non-use of local labor might also be source of conflict. Furthermore, workers may involve themselves in certain culturally unacceptable behaviors that were either rare or non-existent in the project area, before the project.

Proposed mitigation measures

- ❖ Involve, encourage, and maximize use of local skilled and unskilled labor provided that it is compatible with the contractor's skill requirements; and

- ❖ Ensure fair and transparent hiring and staff management procedures and culturally appropriate communication with local communities about available employment opportunities.

Operations and Maintenance Phase

The cause of this impact will be the same as that described under the construction phase above. However, at this stage, there will be few workers employed by the project compared to the construction phase. In comparison to the construction phase above, this impact is considered non-significant during the operations phase and has, therefore, not been assessed further.

Decommissioning Phase

The cause of this impact during the decommissioning phase is the same as that described for the construction phase above only that in this case, the conflict between local and migrant workers will be attributed to the decommissioning phase.

Proposed Mitigation measures

- ❖ Involve, encourage, and maximize use of local skilled and unskilled labor provided that it is compatible with the contractor's skill requirements; and
- ❖ Ensure fair and transparent hiring and staff management procedures and culturally appropriate communication with communities regarding employment opportunities.

2 Labor Influx

Construction Phase

Although the project labor requirements could be fulfilled from local community except few skilled laborers, it is anticipated that In-migration into Juba could be happen due to perceived employment opportunities, which may exert pressure on existing social services; result in poor sanitation due to poor waste disposal, and spikes in crime rates among others. The potential for influx of immigrant labor to the proposed project areas is expected to be relatively low. However, there may be risks related to interaction between project workers and local communities such as: Increase in cases of Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH) if the necessary social protection measures are not put in place by the project. In such a way, Gender-Based Violence (GBV) will increase.

Proposed mitigation measures

- ❖ Develop and implement a Labor Influx management strategy;
- ❖ Develop and implement the Gender Based Violence Management Plan;
- ❖ Develop and implement a Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH) Management Plan;
- ❖ Develop and implement a grievance mechanism to address grievances from local stakeholders; and
- ❖ PIU shall ensure that an area/ site specific assessment of GBV/SEA/SH risks is undertaken within subsequent project ESIAs/ESMPs and that prevention and response measures are put in place.

Operations and Maintenance Phase

During the operations phase, there will be very few workers required to operate and maintain the project infrastructure. It is assumed however, that by this stage, the local community members will have already been sensitized and trained during the construction phase and thus have the necessary skills. Therefore, this impact is considered to be insignificant during the operations phase and has therefore not been assessed further.

Decommissioning Phase

The cause of this impact during the decommissioning phase is the same as that described for the construction phase above only that in this case, the Labour Influx will be attributed to the decommissioning phase activities.

Proposed Mitigation measures

- ❖ Develop and implement a Labour Influx management strategy;
- ❖ Develop and implement the GBV management plan;
- ❖ Develop and implement the Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH) management plan; and
- ❖ Develop and implement a grievance mechanism to address grievances from local stakeholders.

3 Child labor, force labor and violence against children

During subproject construction period, the contractor and other parties may use child labor due to lack of awareness on the proclamation and the negative impact of child labor. Due to the hazardous nature of the project activities mainly component 1, work connected with electric power generation plants, transformers or transmission lines, the project will not employ/engage any person under the age of 18 years of age.

Mitigation Measures

- ❖ Implementing and respecting national labor proclamation and international performance standards requirement.
- ❖ Working closely with local authorities to stop recommending underage children (18 years as a minimum age) for the project construction works.
- ❖ Private sectors and cooperatives, etc. in the project are not employing/engaging anyone under 18 years of age for work in relation to the project.
- ❖ The project should prepare a labor management procedure which provides guidelines to manage labor and working conditions including avoidance of child and forced labor.

4. Involuntary physical and economic displacement and restricted access to natural resources

Some of the project activities may require acquisition of land which triggers involuntary physical and/economical displacement. Temporary relocation of businesses and people who will be affected by the construction. Because the foot print of the civil work activities are not known during preparation, resettlement policy framework which provides guidance on the procedure of land acquisition has been prepared.

The project may have a risk of exclusion, of women, youth and other vulnerable groups including those meeting ESS7 criteria from project benefits and activities. The SEP which has been prepared for this project, provide guidance on engaging and involving the different stakeholders. Besides, the project has been designed in a way that ensures equal access of the service by vulnerable groups.

GBV/SEA/SH risks : the major risk factors of SEA/SH include, the FCV context, the potential engagement of labor outside the local community, lack of access to services including psychosocial, health and GRM, limited coordination among and between local governments. To effectively address project induced SEA/SH risks and impacts, the project has conducted a GBV risk assessment from which, a SEA/SH Action Plan being developed.. The Action Plan contains details of proportional risk mitigation measures that will be put in place to prevent and respond to project related to SEA/SH. Both documents are being finalized and will be disclosed before appraisal.

5. Access to Consultation: This is another risks identified in this project. The client has prepared a stakeholder engagement plan with the objective of ensuring inclusive , culturally appropriate consultation and to incorporate views from all stakeholders through meaningful consultations and feedback to improve

the environmental and social sustainability of the project, enhance its acceptance, and make a significant contribution to successful project design and implementation. The SEP will be disclosed before appraisal.

6. Security related risks: Ensuring security for project operations (including the protection of project workers, beneficiaries and affected persons) will be a challenge during implementation. To reduce and mitigate the potential security risks, the client has conducted a security risk assessment and based on the findings of the assessment, and Security Management Plan. Both documents will be finalized and disclosed by appraisal.

7. Poor sanitation due to improper waste management

Construction Phase

There is a potential for the waste generated during project activities to be poorly handled and result in a decline in the sanitation levels within the project area and sites. Construction waste to be generated during this phase may include emptied cement containers, used oils from construction vehicles, machinery and equipment, packaging materials in the form of plastics and paper. In addition, domestic wastes that may include food waste, food packaging materials brought to site by construction workers, and sewage and human waste, among others. If not properly handled, domestic and construction waste may turn out to be a sanitation hazard as well as attract vermin such as rodents and plastic wastes could affect the health of livestock if ingested and impact water courses/sources.

Proposed mitigation measures

- ❖ All waste generated from construction activities should be properly collected and handled prior to disposal. Biodegradable, non-biodegradable, hazardous and non-hazardous wastes should be segregated accordingly during collection;
- ❖ All waste collected should be disposed of appropriately e.g., a licensed waste collector should be contracted to transport waste material from site to the designated disposal area;
- ❖ The on-site ablution facilities on campsites should be serviced on a regular basis;
- ❖ Anti-vermin safeguards (such as covering bins with lids) should be put in place; and
- ❖ Operations should aim to reduce, re-use and recycle waste in preference to disposal.

Operations and Maintenance Phase

The operation of the Juba grid will not lead to generation of waste during its operation, except for example waste associated with components that have been replaced during maintenance activities. This impact during the operations phase is therefore considered insignificant and has not been assessed further

Decommissioning Phase

The cause of this impact during the decommissioning phase is the same as that described for the construction phase above only that in this case, waste generation will be from the disassembling of temporary facilities that were being used during the extension of the grid network. Additionally, domestic waste may be generated by decommissioning phase workers.

Proposed Mitigation measures

These are similar to those listed for the construction phase above; however, in this case, the measures will be related to the decommissioning phase activities.

5 Increased pressure on the social service sector

Construction Phase

Population increases in the project area due to in-migration of people in search for jobs and economic opportunities will exert increased pressure on local and public resources. There is a likelihood of increased pressure on already strained social service infrastructures like housing, health, water sources and sanitation.

Proposed mitigation measures

- ❖ As give-back, the project may invest in rehabilitation of social service resources such as health centers, water sources among other, as part of Corporate Social Responsibility (CSR) initiatives in order to improve their availability for both the local community members and project workers;
- ❖ Adequate and appropriate sanitary facilities should be constructed for use by the construction workers at the construction site;
- ❖ A water source should be established to supply water demands for the project activities where a base camp is expected to be constructed;
- ❖ Hygiene and sanitation campaigns should be undertaken as a way of sanitation awareness in a bid to control outbreaks of diseases.

Operations and Maintenance Phase

This impact is considered insignificant during the operations phase since very few workers will be required to maintain the grid compared to the construction phase.

Decommissioning Phase

The cause of this impact during the decommissioning phase is the same as that described for the construction phase above only that in this case, the increase of pressure on social service sector will be attributed to the decommissioning crew.

Proposed Mitigation measures

These are similar to those listed for the construction phase above; however, in this case, the measures will be related to the decommissioning phase activities.

6 Increased spread of sexually transmitted diseases and other communicable diseases

Construction Phase

Physical and social interactions between the construction workers and local community members may negatively impact on public health with an increase in the spread of Sexually Transmitted diseases as a result of the socialisation between the locals and project workers, and boosted prostitution.

Proposed mitigation measures

- ❖ Awareness and sensitization campaigns should be undertaken on the dangers of sexually transmitted diseases including HIV/AIDS and methods of spread and control. The HIV/AIDS awareness trainer should collaborate with local Non-Government Organizations (NGOs), Community Based Organizations (CBOs) and District Health Officers for sustainability and integration of activities into the existing structures of the local health institutions;
- ❖ The workforce should be provided with access to primary health care, insecticide-treated mosquito nets if they are housed in a project camp, prescriptions, prophylactics and basic testing for TB, and STDs including HIV/AIDS;
- ❖ The project should engage an NGO to prepare community institutions for any influx of in-migrants (for example, by developing by-laws and community policing systems for larger numbers of in-migrants);
- ❖ The project should provide support to local healthcare facilities through training of local healthcare professionals, regular supply of medical supplies and up to date equipment through Corporate Social Responsibility initiatives;
- ❖ The project should establish a community health Programme including providing support to existing or new local programmes such as mother and child nutrition, community health awareness, HIV/AIDS awareness, hygiene and immunization, malaria control measures (indoor

spraying of insecticides, personal protection measures, and control of mosquito larvae), and local Voluntary Counselling and Testing (VCT) programmes; and

- ❖ All Project workers should be inducted in relevant codes of conduct that minimize exposure to risky life styles including unsafe sex practices.

Operations and Maintenance Phase

The number of workers in this phase will be considerably lower than that in the construction phase. As such, this impact is considered to be insignificant during the operations phase and has therefore not been assessed further.

Decommissioning Phase

The cause of this impact during the decommissioning phase is the same as that described for the construction phase above only that in this case, the increased spread of sexually transmitted diseases will be attributed to the decommissioning crew.

Proposed Mitigation measures

- ❖ The project should undertake awareness and sensitization campaigns on the dangers of sexually transmitted disease including HIV/AIDS and methods of spread and control. The HIV/AIDS awareness trainer should collaborate with local NGOs, CBOs and District Health Officers for sustainability and integration of activities into the existing structures of the local health institutions; and
- ❖ Project workers should be inducted in relevant codes of conduct that minimize exposure to risky life styles including unsafe sex practices.

7 Cultural Heritage

Construction phase

The presence of heritage site can influence the project site selection, design, construction, and implementation. If the proposed project is not properly sited, project construction activities might affect or damage cultural heritage, architectural, archaeological, cultural & historical, ritual and burial sites.

Proposed Mitigation Measures

- ❖ Screen & identify known heritage sites in consultation with local community & relevant institutions
- ❖ Avoid locations where the project would displace, alter or render inaccessible important cultural heritage sites including historical sites/monuments, graves, churches and mosques etc.
- ❖ A chance finds procedure should also be considered if no site is identified at the early stage of the proposed projects.

Operation phase

- ❖ The impact of this risk during this phase is negligible.

Decommissioning phase

- ❖ The impact of this risk during this phase is negligible.

6.3.2 Adverse impacts of setting up mini-grids and off-grid Standalone solar systems

This component will entail electrifying refugee host communities with a solar hybrid with battery storage or a diesel backup as well as electrifying health and educational facilities that are outside major cities with no grid access. Other public facilities such as government administration buildings and publicly shared water supply facilities may also be supported.

A. ENVIRONMENT

1 Terrestrial habitat alteration

a) Selective clearance of vegetation and crops

Construction Phase

During this phase, activities such as clearance of vegetation in areas that will host facilities such as solar power plants, will have adverse impacts on the existing fauna and flora species and ultimately affect the biodiversity of the area.

Proposed mitigation measures

- ❖ Implementing sub project activities near protected areas and critical habitats should be avoided.
- ❖ Land clearance should be restricted to that which is required for the project components to minimize the loss of vegetation;
- ❖ Restrict vehicle movements to and from the project site(s) to the project access road – off-road driving should be prohibited;
- ❖ Site restoration should be undertaken for areas where temporary project infrastructure will be established during the construction phase. The affected areas should be restored and only indigenous vegetation replanted. Intentional restoration using exotic plant species should be avoided; and
- ❖ Sensitize workers against unnecessary destruction, trampling and clearance of flora/crops.
- ❖ In an event that the project activities may have potential adverse impacts on biodiversity, biodiversity management plan should be developed, if the potential risk of project activities are insignificant, the appropriate mitigation measures should be implemented.

Operations and Maintenance Phase

During this phase, natural vegetation such as grass, shrubs and tree branches that are dangerously close to the solar facilities should be maintained/trimmed/pruned.

The magnitude and severity of this impact in this phase is negligible.

Decommissioning Phase

If the temporary access roads are not adequately restored, this may result into soil erosion, bareness of areas that were previously crop farmland and proliferation of invasive plant species onto the sites.

Proposed Mitigation measures

- ❖ Landscape and plant indigenous plant species on areas that previously hosted access routes, pole sites and staging areas.

b) Avian and Bat Collisions and Electrocutions

During construction and operation phase, solar systems can disturb wildlife especially birds through noise and light disturbance at night. It can also confuse water bodies. Furthermore, low, and medium voltage power transmission lines could pose a number of threats to variety of birds including mortality through collision, electrocution and habitat disturbance. Increased lighting may lead to disorientation of birds that utilise the East-Asian/East African flyway which crosses South Sudan and connects breeding ranges in central-Europe and Asia with winter ranges to the South. The impact of avian and bat collisions should be further assessed in the site-specific baseline studies of ESIA. All these threats could result in the loss and reduction of the local birds' population.

Mitigation measures

- ❖ Transmission line corridors should be aligned corridors to avoid critical habitats (e.g., nesting grounds, heronries, rookeries, bat foraging corridors, and migration corridors);
- ❖ Maintaining 1.5-meter spacing between energized components and grounded hardware or, where spacing is not feasible, covering energized parts and hardware;

- ❖ Retrofitting existing transmission or distribution systems by installing elevated perches, insulating jumper loops, placing obstructive perch deterrents (e.g., insulated "V's"), changing the location of conductors, etc.; and
- ❖ Where necessary, Installing visibility enhancement objects such as marker balls, bird deterrents, or diverters.
- ❖ Considering the proposed project where the powerline is insulated, this risk of electrocution expected to be none or minimal and no power line is pass through any known migratory bird routes.
- ❖ Demarcation and avoidance of areas of conservation of interest (high value, species, feeding or breeding sites, migration routes);
- ❖ Making power lines present less of an obstacle for birds to collide with and high-visibility markers should be installed to make the lines more visible to birds;
- ❖ To mitigate habitat disturbance and alteration as much as possible the size of the area to be cleared and used for the project should be minimized.

c) Introduction of invasive species

Construction Phase

Invasive plant species may be introduced in the area as a result of implementation of the proposed project activities. Construction equipment that is not properly cleaned and sterilized has the potential to transport seeds and propagules of invasive species from other parts of South Sudan/or from outside South Sudan to the project work sites. The use of soil obtained from outside the project area, for restoration of scarred areas as well as failure to restore scarred areas, and use of exotic plant species for revegetation in areas that were stripped of vegetation, all promote the proliferation of invasive species which can displace desirable species and crops.

Proposed mitigation measures

- ❖ Potential sources of soil should first be inspected for the presence of invasive species and if any are found, these sources should not be excavated; and
- ❖ Invasive species should be monitored for sprout and if they appear along the access road or at the project site, they should be recorded and managed according to a prepared Invasive Species Management Plan; and
- ❖ Undertake revegetation of scarred project areas by using indigenous plant species that are preferably sourced from the immediate vicinity of the project area.

Operations and Maintenance Phase

Disturbances that facilitate the spread of invasive species will generally be infrequent or minimal during this phase.

Decommissioning Phase

The change in activity and site conditions following project closure are likely to present an opportunity for the invasive plant species to blossom. Land will be left bare following the disassembling of project components and as such, present favorable conditions and new areas for the invasive species to colonise.

Proposed Mitigation measures

- ❖ Invasive species can be monitored for sprout and if they appear along the access road or at the project site they will be recorded and managed according to the Invasive Species Management Plan of the Project.
- ❖ Care should be taken to ensure all equipment is properly cleaned to avoid introduction of invasive species at project site from trucks, and other equipment used during this phase.

d) Soil erosion

Construction Phase

Site preparation activities may include selective clearance of vegetation within the footprint of the down areas, access road to the sites and general levelling of the whole site area. These activities may result in the stripping of vegetation and topsoil, which will need to be stockpiled, backfilled and/or spread on site. This can loosen the ground due to removal of plant roots and expose the ground to agents of erosion. Compaction of the ground will also result in accelerated rates of storm water runoff which directly increases the rate of soil erosion.

Proposed mitigation measures

- ❖ Site preparation should be undertaken in a systematic manner to reduce the risk of open ground to erosion;
- ❖ There should be controlled clearance of vegetation and this should be limited to only sections that are required for the establishment of project infrastructure;
- ❖ An efficient drainage system should be incorporated in the project design to cater for efficient and effective drainage of storm water from the project site and along the access road;
- ❖ Where possible, construction activities should not take place during heavy rain seasons;
- ❖ Disturbed areas should be rehabilitated using suitable indigenous cover grasses; and
- ❖ Landscaping of affected areas should be undertaken following completion of the construction phase to stabilize surfaces.

Operations and Maintenance Phase

Disturbances that facilitate the occurrence of soil erosion are generally minimal during this phase of the project. However, the drainage system and other mitigation measures as listed in the construction phase above will need to be monitored and maintained to ensure continuous storm water management and effectiveness especially around the electric poles.

Decommissioning Phase

During this phase of the project, the project site will be restored to as near to its original state as possible before implementation of project activities. Excavation, levelling and other earthworks may disturb the soil due to the removal of introduced soils.

Proposed Mitigation measures

- ❖ Reinststate soils and original drainage patterns of the area;
- ❖ Re-vegetate any areas used temporarily during construction; and
- ❖ No non-native species should be planted on-site.

e) Soil compaction and loss of soil functioning

Construction Phase

Soil compaction will result from earthmoving activities such as site clearance, excavation and the use of soil compactor machines. Movements of equipment, vehicles and delivery trucks are also likely to result in soil compaction along the footprint of the access road to the sites. Soil compaction alters soil physical and chemical properties by reducing the composition of air, reducing the rate of infiltration and formation of a hard pan which increases soil resistance to root penetration. As a result, productivity of the soil decreases, hence loss of soil functioning.

Proposed mitigation measures

- ❖ Limit the project activities to the footprint of the required project area;
- ❖ Utilize vehicles with wide tires to minimize pressure exerted onto the ground;
- ❖ Prohibit off-road driving and parking outside of designated parking area;
- ❖ Stockpile the surface soil on the side of the project site for future use in landscaping; and

- ❖ Upon completion of work, the soil in any affected areas should be scarified to alleviate the effects of compaction.

Operations and Maintenance Phase

During the operations phase, only light vehicles will be utilized for operation and maintenance of the distribution power lines and poles. These will be restricted to the project access road. The extent of compaction likely to be caused is considered negligible.

Decommissioning Phase

Movement of decommissioning equipment, vehicles and trucks at the site are likely to result in soil compaction.

Proposed Mitigation measures

- ❖ Driving outside the designated working areas should be prohibited to prevent soil compaction and habitat disturbance or destruction; and
- ❖ Upon completion of work, the soil in any affected areas should be scarified to alleviate the effects of compaction.

2 Electric and Magnetic Fields (EMF) Impacts

Construction Phase

Electric and magnetic fields (EMF) are invisible lines of force emitted by and surrounding any electrical device (e.g., power lines and electrical equipment). This impact is not expected to occur during the construction phase since the powerlines and substations will not be energised at this stage.

Operations and Maintenance Phase

Electric fields are produced by high voltage and increase in strength as the voltage increases. There is public and scientific concern over the potential health effects associated with exposure to EMF (e.g., from high voltage power lines and substations). As a matter of precaution, the following mitigation measures should be undertaken.

Proposed mitigation measures

- ❖ Evaluate potential exposure to the public against the reference levels developed by the International Commission on Non-Ionizing Radiation Protection (ICNIRP)^{18,19}. Average and peak exposure levels should remain below the ICNIRP recommendation for General Public Exposure²⁰;
- ❖ Consider siting new facilities so as to avoid or minimize exposure to the public. Installation of transmission lines or other high voltage equipment above or adjacent to residential properties or other locations intended for highly frequent human occupancy, (e.g., schools or offices), should be avoided; and
- ❖ If EMF levels are confirmed or expected to be above the recommended exposure limits, application of engineering techniques should be considered to reduce the EMF produced by power lines, substations, or transformers. Examples of these techniques include:
 - Shielding with specific metal alloys;
 - Increasing height of transmission towers; and

¹⁸ ICNIRP is a non-governmental organization formally recognized by the World Health Organization (WHO), which published the "Guidelines for Limiting Exposure to Time-varying Electric, Magnetic, and Electromagnetic Fields" following reviews of all the peer-reviewed scientific literature, including thermal and non-thermal effects. The standards are based on evaluations of biological effects that have been established to have health consequences. The main conclusion from the WHO reviews is that exposures below the limits recommended by the ICNIRP international guidelines do not appear to have any known consequence on health.

¹⁹ An additional source of information is the Institute of Electrical and Electronics Engineers. See IEEE (2005).

²⁰ The ICNIRP exposure guidelines for General Public Exposure are listed in Section 2.1 of the EHS Guidelines for Electric Power Transmission and Distribution.

- Modifications to size, spacing, and configuration of conductors

Decommissioning Phase

This impact is not expected to occur during this phase of the project since the powerlines will be deenergized and workers will not be exposed to EMF thus the impact in this phase is negligible.

3 Hazardous materials and Waste

a) Spillage and leakages

Construction Phase

During the construction of standalone solar systems, oil spill, leakage and improper disposal of used oil, and automotive fluids including brake fluid, transmission fluid, grease, other lubricants, and petroleum-based cleaning solvent wastes used during operation and maintenance of project vehicles and heavy machineries, could cause significant environmental pollution including damaging aquatic ecosystems and habitats.

Proposed mitigation measures

- ❖ Vehicle maintenance and servicing should be done only on purpose-built impervious concrete platforms with oil and grease traps;
- ❖ Avoid leakages from vehicles and construction plant by regular and effective maintenance, and accidental spills through good practice by ensuring all equipment is in good condition, clean and free from leaks;
- ❖ Undertake vehicle inspection using a pre-developed vehicle inspection checklist for all project vehicles;
- ❖ Do not wash vehicles in wetlands, lakes, streams or rivers;
- ❖ In case of an oil spill or leaks, contaminated topsoil should be scooped and disposed of appropriately;
- ❖ Establish temporary and/or permanent waste spill containment structures;
- ❖ Prepare and implement emergency preparedness and response plans related to oil spill emergencies;
- ❖ Ensure that all equipment containing fluids such as generators and batteries are placed on drip trays during transportation and prior to installation;
- ❖ Establish secondary containment for any spills for the gazetted packing area for project vehicles; and
- ❖ Ensure that the fuel storage tanks have secondary containment.

Operations and Maintenance Phase

During the operations phase, the on-site project maintenance vehicles could leak fuel and hydraulic fluids which if not contained could harm the environment. The lead acid solar batteries could also lead acid into the environment.

Proposed Mitigation measures

It is envisaged that during the operations phase, project staff will have been trained in spill response, there will be bunding around the fuel storage areas, the vehicle packing area will be concretized, and have containment for any fuel spills, among others. As such there are no additional mitigation measures other than those already proposed under the construction phase.

Decommissioning Phase

The decommissioning phase will entail dismantling the fuel storage areas, and generator storage areas, and disassembling the solar panels among others. This will pose a risk of spills of fuel, vehicle hydraulics, and battery acids among others which could impact the environment.

Proposed Mitigation measures

- ❖ Ensure to have a decommissioning plan that covers aspects of spill control in place; and
- ❖ Ensure to place the batteries, and any other equipment with the potential for leakages on drip trays during disassembling and transportation.

b) Hazardous Materials

Construction Phase

The impact related to this aspect is not expected to occur in this phase of the project since concrete and not wooden treated poles will be used.

Proposed Mitigation Measures:

- ❖ Due to the fact that most solar PV systems employ lead acid batteries, retrieval and recycling programs need to be incorporated to assure that the disposal of batteries does not result in environmental impact. Hence:
- ❖ These wastes should be collected, segregated and temporarily stored at designated waste disposal sites;
- ❖ As there are no known facilities to dispose of hazardous waste in the country. The Contractor should consider designing a temporary hazardous waste storage facility in consideration of the generated waste amounts and timing before final disposal by licensed hazardous waste handlers in accordance with the national legislative requirements and world Bank ESF requirements and GIIP practices.
- ❖ Procurement of electronic equipment from credible manufacturers with no or minimum adverse environmental impacts;
- ❖ Undertake trainings on waste management processes, awareness creation and sensitization program for the proponent and end users about potential negative impacts;
- ❖ All wastes shall be properly disposed of in accordance with the national and international legislative requirements; and
- ❖ Capacitate and support licensed companies involved in hazardous waste management in all aspects including financial and technical supports where possible.

Operations and Maintenance Phase

The impact of this risk during this phase is negligible.

Decommissioning Phase

During decommissioning, a lot of hazardous waste such as electric wires, used and damaged/recycled batteries, /burned transformers, other used solar and/or damaged solar panel and lantern parts, polythene, plastics, etc. will be generated. Poor management of these hazardous wastes would impose adverse impact on the environment (soil, and ground and surface water contamination), and human health.

Proposed Mitigation Measures:

- ❖ In addition to the mitigation measures already discussed during the construction phase, the project developer should have a decommissioning plan in place that addresses aspects of waste management.

c) Waste Management

Construction Phase

Construction activities will produce considerable amount of waste including waste generated by construction works and other associated facilities. Indiscriminate disposal and/or storage of solid and liquid

wastes including, packages, and leftover construction materials and cements, have the potential to generate an adverse impact on the nearby environment and health and safety of the workers, local community and the beneficiaries. In addition, Solid wastes could also be generated from work sites, campsites, offices, cafeteria, workshops & stores. These include excavated soil material, paper wrapping, containers for various construction materials and metal scraps and packing materials and food leftovers among others will cause pollution and littering of the immediate and localized environment.

Unmanaged disposal & inadequate solid waste management could affect productive lands, the accumulation of solid waste on open lands, in water ways and drains which will be the source of pests and diseases & environmental pollution & clogging of drains, the creation of erosion, sedimentation, drainage problems and flooding.

Food wastes also attract scavengers (rodents, birds, dogs, cats) some of which are potential vectors of diseases including cholera, diarrhea etc. and may create nuisance to the local community.

Proposed Mitigation measures

- ❖ Personnel should aim to reduce, re-use, and recycle waste in preference to disposal;
- ❖ Undertake Proper waste segregation and storage;
- ❖ Provide solid waste handling facilities such as separate waste bins for biodegradable and non-degradable wastes until waste generated is disposed of at authorized dumping sites;
- ❖ Final domestic and/or other nonhazardous wastes, after proper segregation, should be disposed of safely at the designated waste disposal site;
- ❖ Maximize the re-use of all excavated materials in the construction works;
- ❖ Disposal of surplus material (spoil) only at designated sites approved by the responsible local authority and only by approved methods;
- ❖ No spoil should be disposed of in wetlands, near watercourses and other important habitats;
- ❖ Conduct regular awareness creation, training and sensitization for the project proponent, workers and community reside in the area on the potential negative impacts, health and safety risks, of solid wastes, proposer waste management practices, and processes;
- ❖ All wastes shall be properly disposed of in accordance with the national legislative requirements and world Bank ESF requirements and GIIP practices;
- ❖ The contractor should engage a refuse handling company to remove the wastes from the site to the approved dumping site and authorized landfill sites;
- ❖ The contractor should erect warning signs against littering and dumping sites within the construction site;
- ❖ Excavated topsoil should be used as backfill by the contractor; and
- ❖ The contractor shall develop a waste management plan in line with the national policies, standards and guidelines as well as international standards, including World Bank Group Environmental, Health, And Safety (EHS) Guidelines GENERAL EHS GUIDELINES: Environmental Waste Management.

Operations and Maintenance Phase

The stand-alone solar plants are not envisaged to generate waste during day-to-day operations, except for example waste associated with components that have been replaced during maintenance activities. However, poor management of domestic waste could cause poor sanitation. Additionally, during the operations phase, it is expected that there will be a limited number of people on site, this phase will also involve washing the solar panels once or twice annually, or as required, using local labor, and water with a low concentration of salts.

Additionally, although domestic and sanitary waste will also be generated during operations and maintenance of the power plants including; foodstuffs, plastics, paper, and human waste, it is assumed that at this stage, permanent waste management facilities/services e.g. the septic tank for management of sewage, and waste storage and management areas, including a licensed waste contractor who handles and disposes of waste, will have been established for the project and will be fully functional. Therefore, no further mitigation measures have been proposed.

Decommissioning Phase

The cause of this impact during the decommissioning phase is the same as that described for the construction phase above only that in this case, waste generation will be from the disassembling of the power plant in addition to domestic waste generated by decommissioning phase workers.

Proposed Mitigation measures

- ❖ The measures are similar to those listed above in the construction phase section.

d) Impacts on water quality

Construction phase

Accidental spillage or leakage of polluting materials like oil spill, leakage and improper disposal of used oil and inadequate provision of sanitary and waste facilities would have adverse effect to the ground and surface water quality.

Proposed Mitigation Measures

- ❖ Following the national standard of water quality (if the water quality standard available) to meet required standards adequate provision for treatment and disposal of sanitary and other liquid waste in such a way as will not result in any form of pollution of water resources. In case of absence of national water quality standard, the world bank ESHG will be applicable. If the national water quality standard available, the most stringent requirements between local and WB standards shall prevail;
- ❖ Take all reasonable precautions to prevent spillages and leakage; .
- ❖ Prohibit washing of project vehicles, plant, and machinery in or adjacent to any water sources.
- ❖ All washing to be carried out at designated areas away from water sources.

Operations and Maintenance Phase

Accidental spillage or leakage of polluting materials slightly occur during decommissioning phase due to used oils from vehicles transporting.

Proposed Mitigation measures

- ❖ The measures are similar to those listed above in the construction phase section.

Decommissioning Phase

Accidental spillage or leakage of polluting materials slightly occur during decommissioning phase.

Proposed mitigation measures

- ❖ In addition to the mitigation measures already discussed during the construction phase, the project developer should have a decommissioning plan in place that addresses aspects of water quality management.

4 Noise and vibrations effects

Construction Phase

The major sources of noise and vibration during the construction of the off-grid electrification through standalone solar systems will be mainly from construction equipment and the construction crew. Some of

these noise sources are continuous e.g., all access road construction activities, while others are intermittent, such as earthworks, piling, site levelling, ramming of the PV mounting structures etc.

Proposed mitigation measures

- ❖ Prior notice/community awareness will be undertaken for the local community members to keep them informed of what will take place/schedules of the project activities so that they are able to plan accordingly;
- ❖ Construction activities will be limited to only daytime hours;
- ❖ Noise monitoring will be undertaken within the area and at nearby sensitive receptor sites during construction;
- ❖ Use of well-maintained and serviced equipment that generates low noise levels will be emphasized;
- ❖ Workers involved in construction activities will be provided with requisite Personal Protective Equipment; and
- ❖ Idling of machinery including vehicles will be prohibited unless necessary.

Operations and Maintenance Phase

Noise emissions during the operations phase will be from vehicles transporting the operations and maintenance crew. Additionally, low levels of noise may result from the transmission of electricity at connection points and where electricity is transferred to the grid. Such noises are likely to be insignificant, as is the noise likely to be generated from the limited number of operation and maintenance personnel, as well as the few light vehicles that will be utilized during this phase of the project.

The impact is considered non-significant and has therefore not been assessed further

Decommissioning Phase

The cause of this impact during the decommissioning phase is the same as that described for the construction phase above only that in this case, the increase in noise and vibrations will be a result of disassembling of the power plant and where necessary transportation of the project infrastructure/equipment like the solar panels.

Proposed mitigation measures

The mitigation measures for the decommissioning phase are the same as those listed for the construction phase above; however, in this case, the measures will be related to the decommissioning phase activities.

5 Alteration of ambient air quality

Construction Phase

The most significant sources of gaseous emissions during the construction phase are expected to be from the operation of vehicles and equipment. With regards to the construction equipment, the construction equipment will include but will not be limited to; cranes, cherry pickers, forklifts, trucks, drill machines (optional), excavators, scrapers, and roller compactor machines. The gaseous emissions caused by the project based on the above-listed equipment, are expected to include; CO₂, NO₂, SO₂, volatile organic compounds and BTEX since most of the construction equipment and machinery will be powered by diesel engines.

Significant receptors as far as any changes in ambient air quality are concerned, will be the local community members surrounding the proposed project area and all construction sites. It is also important to note that, gaseous emissions are not restricted to the project area, they can spread to a wider area as determined by the direction of the wind.

Proposed mitigation measures

- ❖ Ensure construction equipment deployed at the project site is in good condition and routinely maintained to ensure they are efficient and emit relatively low exhaust fumes;
- ❖ Discourage open burning of waste; and
- ❖ Operate emission-producing equipment only when necessary and avoid unnecessary idling of equipment.

Operations and Maintenance Phase

Gaseous emissions during this phase may majorly arise from light vehicles transporting the operation and maintenance crew to and from the sites. The actual operation of the Off-grid electrification through standalone solar systems is not expected to have pollutant emissions implications because the plant is designed to generate power without combustion.

These emissions are thus considered insignificant and have therefore not been assessed further

Decommissioning Phase

The cause of this impact during the decommissioning phase is the same as that described for the construction phase above only that in this case, increased gaseous emissions will be from the disassembling of the power plant and associated transportation along the access roads.

Proposed Mitigation measures

The mitigation measures for the decommissioning phase are the same as those described for the construction phase above.

B. OCCUPATIONAL HEALTH AND SAFETY

1 Working at height on Poles

Construction Phase

Workers may be exposed to occupational hazards when working at elevations during the construction phase which entails accessing the high points of buildings or poles in order to install solar panels.

Proposed mitigation measures

- ❖ The project should have Environment, Health and Safety roles assigned to trained personnel;
- ❖ The project should have an Occupational Health and Safety Plan;
- ❖ Conducting Job risk assessments and instituting permit to work provisions for activities that are undertaken at a height;
- ❖ Activities at a height should only be undertaken by well trained personnel;
- ❖ Testing structures for integrity prior to undertaking work;
- ❖ Implementation of a fall protection program that includes training in climbing techniques and use of fall protection measures; inspection, maintenance, and replacement of fall protection equipment; and rescue of fall-arrested workers, among others;
- ❖ Hoisting equipment should be properly rated and maintained and hoist operators properly trained; and
- ❖ An approved tool bag should be used for raising or lowering tools or materials to workers on structures.

Operations and Maintenance Phase

Workers may be exposed to occupational hazards when working at elevations during the maintenance of conducting wires and components of the grid that are located at a height.

Proposed Mitigation measures

- ❖ Conducting Job risk assessments and instituting permit to work provisions for activities that are undertaken at a height;
- ❖ Testing structures for integrity prior to undertaking work; and
- ❖ Maintenance activities at a height should only be undertaken by trained personnel.

Decommissioning Phase

The impact of this aspect in this phase is negligible. However, should it be necessary to work at height, the measures as suggested for the construction phase will apply to this phase too.

Proposed Mitigation measures

- ❖ Conducting Job risk assessments and instituting permit to work provisions for activities that are undertaken at a height.

2 Other occupational health and safety risks and impacts

The off-grid and mini-grid project may cause falls, injuries, and fatalities etc. There is potential for impacts on human health and safety to occur because of accidents and unplanned events that may occur during the construction and installation of the proposed project components and potential occupational injuries and accidents could exist in all stages, including during construction and operation phases.

Proposed Mitigation Measures:

- ❖ The construction contractors should develop environmental; health and safety (EHS) management plans which outline procedures for avoiding health and safety incidents and emergency medical treatment. This requirement should be achieved by making it as part of project contractual agreements;
- ❖ Introducing & implementing proactive preventive measures including minimizing the hazard: through design of safe work systems and administrative or institutional control measures such as training on safe work procedures, workplace monitoring, regular safety inspections, limiting exposure or work duration;
- ❖ Providing all necessary personal protective equipment (PPE) in conjunction with training, use, and maintenance of the PPE to the workers and enforce that PPEs are used for the safety and health of workers;
- ❖ The project implementation unit shall engage dedicated personnel competent on the basis of appropriate education, training, and experience to manage and oversee the health, safety and environment (HSE) aspects of the project; and
- ❖ The HSE personnel shall ensure that the project and contractors operate in accordance with the applicable national and international regulatory HSE requirements and plans; and also monitor implementation of environmental and social protection measures.

C. COMMUNITY HEALTH AND SAFETY

1 Electrocution

Construction Phase

This impact may occur during the installation of power distribution lines on the mini-grids as well as during installation of solar power panels. However, if care is taken to ensure that the lines are always de-energized during works on them, this risk can be reduced to as low as reasonably practicable.

Operations and Maintenance Phase

Activities during this phase will entail maintenance/trimming/pruning of the vegetation or trees near the power distribution lines and solar panels. This phase will also entail undertaking works on faulty power lines and replacing defective/damaged solar panels.

Proposed Mitigation measures

- ❖ Undertake risk assessments for powerlines and solar panels that have been reported to be faulty;
- ❖ Assign works on faulty powerlines and solar panels to competent personnel;
- ❖ Sensitize community members to avoid illegal connections to the grid. Additionally, information should be provided to communities to report any cases of fallen electric wires and broken panels to the responsible authorities; and
- ❖ Issue the right PPE to personnel that will be tasked with works on faulty powerlines.

Decommissioning Phase

The impact of this risk in this phase is negligible.

2 Soil, groundwater, and surface water drainage

Construction Phase

The principal sources of soil, surface and groundwater contaminants during the construction phase are expected to be diesel, and motor oil and grease leaks from construction vehicles and equipment. Lubricants and other toxic materials such as sulphuric acid used in equipment and machinery, discharge of silt-laden runoff and improper disposal of waste and wastewater from the construction sites may also negatively impact surface and groundwater quality.

Contaminated run-off from spill sites could have an adverse impact on water quality if it drained into surface water bodies or infiltrated the groundwater. The extent of this impact will vary depending on the size, frequency, and timing of spills (if any) and leaks in relation to conditions in the receiving surface water bodies, soil properties at the point source, and the nature of the materials involved, including their toxicity.

Inappropriate disposal of waste and wastewater from the construction site also has the potential to have negative effects on soil, surface, and groundwater quality. However, the extent of this potential impact will also vary depending on the location and properties of soil at discharge points and the dilution/mixing regime possible in the receiving waters.

Proposed mitigation measures

- ❖ Undertake routine preventive maintenance of motorised equipment to control oil leakages;
- ❖ Inspection of the condition of vehicles will be undertaken on a daily basis to ensure they are in good working condition and no leakages are registered. Equipment identified with any leakage will be repaired before being used again;
- ❖ As part of emergency preparedness, a spill contingency plan will be put in place and staff trained in the use of spill-cleaning equipment for proper management of fuel and chemical spillages;
- ❖ Secondary containment measures in areas where fuels, oils, lubricants, and construction materials such as cement are stored and loaded or unloaded, including fueling points will be installed;
- ❖ The onsite substation will be lined with sand to absorb any chemical spillages from equipment;
- ❖ In case of oil pollution, sedimentation and siltation, halt construction activities immediately and recover the pollutant before it reaches the receiving water sources. In addition, avoid washing construction equipment at the transfer station to avert pollution of receiving water sources;
- ❖ Design and install a septic tank system for human sanitary purposes; and
- ❖ Provide disposal facilities for wastes.

Operations and Maintenance Phase

Sources of soil and water contaminants during the operations phase will result from spillage of fuels, lubricants, and other toxic materials from project equipment such as transformers and maintenance vehicles.

Domestic and sanitary waste will also be generated during operations and maintenance of the power plant even though there will be a limited number of project personnel at the site. Additionally, maintenance activities such as the washing of the PV modules once or twice annually, or as required, using local labour will generate wastewater, although the quality of water required for cleaning of panels should have a low concentration of salts and no additives and it is therefore unlikely that this water will result in contamination.

Proposed Mitigation measures

- ❖ Regular and routine monitoring and maintenance will be undertaken to ensure that all project equipment is in good working condition at all times; and
- ❖ Regular maintenance of operations vehicles off-site thus minimizing the potential for leakages.

Decommissioning Phase

The principal sources of soil and water contaminants during the decommissioning phase are the same as those described for the construction phase above. However, unlike the construction phase, the decommissioning phase will involve the dismantling of the solar array and equipment.

Proposed Mitigation measures

- ❖ Undertake routine preventive maintenance of motorized equipment to control oil leakages;
- ❖ Inspection of the condition of vehicles will be undertaken on a daily basis to ensure they are in good working condition and no leakages are registered. Equipment identified with any leakage will be repaired before being used again;
- ❖ In case of oil pollution, sedimentation and siltation, halt demolition activities immediately and recover the pollutant before it reaches the receiving water sources; and
- ❖ Provide disposal facilities for wastes.

3 Increased traffic

Construction Phase

The transportation of materials and machinery may lead to an increase in traffic congestion and road accidents. Typical civil engineering construction equipment will need to be brought to the site (e.g., trucks, graders, compaction equipment, cement trucks, etc.) to make concrete electricity poles as well as components required for the establishment of the stand-alone solar systems. This equipment will be transported to the site using national, provincial, and local roads. Haulage of construction materials will result in increased traffic on the existing roads national and community roads. The increased traffic and transportation of heavy loads may damage the existing roads leaving them in a worse state and may also increase the potential for accidents, especially along the roads in the community leading to and from the proposed project site.

Proposed mitigation measures

- ❖ Travel in convoys and at designated times to decrease and avoid peak travel/ movement times within the project area;
- ❖ Journey-specific risk assessments which will include the identification of potentially sensitive receptors along the traffic routes should be conducted. For significant traffic movements, including transport of construction materials to site, any affected communities/residents along the route should be sensitised, and wherever possible, attempts made to undertake the traffic movements at the least busy times of day;
- ❖ When travelling in community areas, speed limits on transportation routes should be maintained at 40km/hr for light vehicles and 30km/hr for heavy vehicles;
- ❖ Only approved drivers should be allowed to operate vehicles;

- ❖ Construction materials should wherever possible, be preferentially sourced locally in a manner that reduces environmental and social impacts (e.g., transport distances) and maximizes local economic development opportunities;
- ❖ All roads should have clear and visible signage especially in community areas, around schools and hospitals to minimize the risk of accidents;
- ❖ Each road junction near the project sites should have a traffic controller or signal person to monitor and direct traffic flow;
- ❖ All staff should undergo an Environment, Health and Safety induction process which includes rules for safe driving, including speed limits in community areas; and
- ❖ Construction equipment should be maintained on site until the construction is complete to reduce on vehicle movement (Taking into consideration, their security).

Operations and Maintenance Phase

The cause of this impact will be the same as that described under the construction phase above. However, at this stage, there will be few workers employed by the project compared to the construction phase. In comparison to the construction phase above, this impact is considered non-significant during the operations phase and has therefore, not been assessed further.

Decommissioning Phase

During the implementation of decommissioning phase, traffic in the area will increase as a result of project related vehicular movements associated with the offsite transportation of the decommissioned equipment and debris from dismantled surfaces. Furthermore, increased traffic and transportation of heavy decommissioned loads may damage the existing roads leaving them in a worse state.

Proposed Mitigation measures

The mitigation measures for the decommissioning phase are the same as those described for the construction phase above.

D. SOCIAL ASPECTS

1 Conflict between Local and Migrant Workers

Construction Phase

The power distribution, off-grid, and mini-grid projects will create job opportunities for skilled and unskilled laborers during the construction phase of the project resulting in the immigration of workers to the project site. This could potentially lead to conflict between the local community and workers that do not originate/reside in the project area. Additionally, compensation of Project Affected Persons (PAPs) could increase conflicts between women and men, resulting into increased cases of domestic violence. Unfair employment processes and non-use of local labor might also be source of conflict. Furthermore, workers may involve themselves in certain culturally unacceptable behaviors that were either rare or non-existent in the project area, before the project.

Proposed mitigation measures

- ❖ Involve, encourage, and maximize use of local skilled and unskilled labor provided that it is compatible with the contractor's skill requirements; and
- ❖ Ensure fair and transparent hiring and staff management procedures and culturally appropriate communication with local communities about available employment opportunities.

Operations and Maintenance Phase

The cause of this impact will be the same as that described under the construction phase above. However, at this stage, there will be few workers employed by the project compared to the construction phase. In

comparison to the construction phase above, this impact is considered non-significant during the operations phase and has, therefore, not been assessed further.

Decommissioning Phase

The cause of this impact during the decommissioning phase is the same as that described for the construction phase above only that in this case, the conflict between local and migrant workers will be attributed to the decommissioning phase.

Proposed Mitigation measures

- ❖ Involve, encourage, and maximize use of local skilled and unskilled labor provided that it is compatible with the contractor's skill requirements; and
- ❖ Ensure fair and transparent hiring and staff management procedures and culturally appropriate communication with communities regarding employment opportunities.

2 Labor Influx

Construction Phase

Although the project labor requirements could be fulfilled from local community except few skilled laborers, it is anticipated that In-migration into project areas could happen due to perceived employment opportunities, which may exert pressure on existing social services; result in poor sanitation due to poor waste disposal, and spikes in crime rates among others. The potential for influx of immigrant labor to the proposed project areas is expected to be relatively low. However, there may be risks related to interaction between project workers and local communities such as: Increase in cases of Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH) if the necessary social protection measures are not put in place by the project. In such a way, Gender-Based Violence (GBV) will increase.

Proposed mitigation measures

- ❖ Develop and implement a Labor Influx management strategy;
- ❖ Develop and implement the Gender Based Violence Management Plan;
- ❖ Develop and implement a Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH) Management Plan;
- ❖ Develop and implement a grievance mechanism to address grievances from local stakeholders; and
- ❖ PIU shall ensure that an area/site specific assessment of GBV/SEA/SH risks is undertaken within subsequent project ESAs/ESMPs and that prevention and response measures are put in place.

Operations and Maintenance Phase

During the operations phase, there will be very few workers required to operate and maintain the project infrastructure. It is assumed however, that by this stage, the local community members will have already been sensitized and trained during the construction phase and thus have the necessary skills. Therefore, this impact is considered to be insignificant during the operations phase and has therefore not been assessed further.

Decommissioning Phase

The cause of this impact during the decommissioning phase is the same as that described for the construction phase above only that in this case, the Labor Influx will be attributed to the decommissioning phase activities.

Proposed Mitigation measures

- ❖ Develop and implement a Labor Influx management strategy;
- ❖ Develop and implement the GBV management plan;

- ❖ Develop and implement the Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH) management plan; and
- ❖ Develop and implement a grievance mechanism to address grievances from local stakeholders.

3 Child labor, force labor and violence against children

Construction phase

During subproject construction period, the contractor and other parties may use child labor due to lack of awareness on the proclamation and the negative impact of child labor. Due to the hazardous nature of the project activities of component 2 and 3, work connected with waste battery and related activities of the project will not employ/engage any person under the age of 18 years of age. Moreover, violence against children and child labor are highly anticipated given the fragile environment.

Proposed Mitigation measures

- ❖ Implementing and respecting national labor proclamation and international performance standards requirement.
- ❖ Working closely with local authorities to stop recommending underage children (18 years as a minimum age) for the project construction works.
- ❖ Private sectors and cooperatives, etc. in the project are not employing/engaging anyone under 18 years of age for work in relation to the project.
- ❖ The project should prepare a labor management procedure which provides guidelines to manage labor and working conditions including avoidance of child and forced labor.

Operations and Maintenance Phase

4 Increased pressure on the social service sector

Construction Phase

Population increases in the project area due to in-migration of people in search for jobs and economic opportunities will exert increased pressure on local and public resources. There is a likelihood of increased pressure on already strained social service infrastructures like housing, health, water sources and sanitation.

Proposed mitigation measures

- ❖ As give-back, the project may invest in rehabilitation of social service resources such as health centers, water sources among other, as part of Corporate Social Responsibility (CSR) initiatives in order to improve their availability for both the local community members and project workers;
- ❖ Adequate and appropriate sanitary facilities should be constructed for use by the construction workers at the construction site;
- ❖ A water source should be established to supply water demands for the project activities where a base camp is expected to be constructed; and
- ❖ Hygiene and sanitation campaigns should be undertaken as a way of sanitation awareness in a bid to control outbreaks of diseases.

Operations and Maintenance Phase

This impact is considered insignificant during the operations phase since very few workers will be required to maintain the grid compared to the construction phase.

Decommissioning Phase

The cause of this impact during the decommissioning phase is the same as that described for the construction phase above only that in this case, the increase of pressure on social service sector will be attributed to the decommissioning crew.

Proposed Mitigation measures

These are similar to those listed for the construction phase above; however, in this case, the measures will be related to the decommissioning phase activities.

5 Increased spreads of sexually transmitted diseases and other communicable diseases

Construction Phase

Physical and social interactions between the construction workers and local community members may negatively impact on public health with an increase in the spread of Sexually Transmitted diseases as a result of the socialization between the locals and project workers, and boosted prostitution.

Proposed mitigation measures

- ❖ Awareness and sensitization campaigns should be undertaken on the dangers of sexually transmitted diseases including HIV/AIDS and methods of spread and control. The HIV/AIDS awareness trainer should collaborate with local Non-Government Organizations (NGOs), Community Based Organizations (CBOs) and District Health Officers for sustainability and integration of activities into the existing structures of the local health institutions;
- ❖ The workforce should be provided with access to primary health care, insecticide-treated mosquito nets if they are housed in a project camp, prescriptions, prophylactics and basic testing for TB, and STDs including HIV/AIDS;
- ❖ The project should engage an NGO to prepare community institutions for any influx of in-migrants (for example, by developing by-laws and community policing systems for larger numbers of in-migrants);
- ❖ The project should provide support to local healthcare facilities through training of local healthcare professionals, regular supply of medical supplies and up to date equipment through Corporate Social Responsibility initiatives;
- ❖ The project should establish a community health Programme including providing support to existing or new local programmes such as mother and child nutrition, community health awareness, HIV/AIDS awareness, hygiene and immunization, malaria control measures (indoor spraying of insecticides, personal protection measures, and control of mosquito larvae), and local Voluntary Counselling and Testing (VCT) programmes; and
- ❖ All Project workers should be inducted in relevant codes of conduct that minimize exposure to risky life styles including unsafe sex practices.

Operations and Maintenance Phase

The number of workers in this phase will be considerably lower than that in the construction phase. As such, this impact is considered to be insignificant during the operations phase and has therefore not been assessed further.

Decommissioning Phase

The cause of this impact during the decommissioning phase is the same as that described for the construction phase above only that in this case, the increased spread of sexually transmitted diseases will be attributed to the decommissioning crew.

Proposed Mitigation measures

- ❖ The project should undertake awareness and sensitization campaigns on the dangers of sexually transmitted disease including HIV/AIDS and methods of spread and control. The HIV/AIDS awareness trainer should collaborate with local NGOs, CBOs and District Health Officers for sustainability and integration of activities into the existing structures of the local health institutions; and
- ❖ Project workers should be inducted in relevant codes of conduct that minimize exposure to risky life styles including unsafe sex practices.

6 Vandalism of solar and mini-grid equipment

Construction Phase

Vandalism of solar systems, due to the political instability and high crime rate in some areas in South Sudan. Solar systems might be vandalized especially the solar panels and batteries which will cause financial loss to the government of South Sudan while replacing the vandalized solar systems, and also affect the sustainable supply of electricity to public facilities and community members.

Proposed mitigation measures

- ❖ The PIU should work closely with the Ministry of National Security to provide security to the project infrastructure;
- ❖ Work with local government institutions in the hard-to-reach areas to provide security updates to the PIU; and
- ❖ Establish good working relations with local authorities and communities and encourage them to ensure the security of the solar equipment.

Operations and Maintenance Phase

There could be cases of maintenance workers vandalizing solar power equipment when undertaking maintenance works.

Proposed mitigation measures

- ❖ Workers should be monitored and proper work schedules designed so that workers undertake tasks where they have been deployed.

Decommissioning Phase

- ❖ The impact of this risk in this phase is negligible.

7. involuntary physical and economic displacement and restricted access to natural resources

Temporarily loss of livelihood

People mainly doing business on the streets of Juba may lose their work. These are mainly women who will be economically displaced temporarily.

Proposed mitigation measures

- ❖ Resettlement framework has been prepared,
- ❖ Stakeholder consultation should be conducted and disclose information.

8. Exclusion of women, youth and other vulnerable groups

The main challenges faced by people with disabilities are access to basic services and discrimination that hinders their participation in social, political and economic life. Women with disabilities experience higher levels of physical, psychological and sexual violence. Elders with disabilities face greater challenges due to less access to food, wash facilities and other support.

Proposed mitigation measures

- ❖ Ensure that space for meetings and other project activities are physically accessible.
- ❖ Consider timing for activities, which fits within women daily activity calendar.

- ❖ For management of GBV/SEA/SH and related risks for women with disabilities, the project should sensitize community on the risks and channels of reporting such cases.
- ❖ The project should respect differences and use language, which does not stigmatize anyone.

9. GBV/SEA/SH risks

The WB's GBV rating for the South Sudan energy access is High Risk. While project activities may have risks of GBV/SEA/SH— mostly in relation to the planned construction works, Labor influx, for example, can lead to GBV/SEA/SH cases between workers and community members; or the recruitment of community workers bears risks of SEA/SH. The sub-projects may be implemented in areas with active humanitarian situations or local conflicts. It includes areas that will be hard to supervise, where female and male workers will be working in close proximity with limited supervision.

Proposed mitigation measures

- ❖ Gender Based Violence (GBV)/A Sexual Exploitation and Abuse (SEA)/ Sexual Harassment (SH) Action Plan will be developed.
- ❖ A GBV/SEA/SH Action Plan should be implemented and adhered by the contractor and MoED.
- ❖ Ensure that the Project does not have any negative impacts or further promotes GBV, SEA/SH or the abuse of children.
- ❖ The SEA/SH Action Plan is guided by the commitments related to SEA/SH included in the Project Environmental and Social Commitment Plan (ESCP) and it provides procedures for grievances related to such abuse in project areas. It is based on existing protection, prevention and mitigation strategies and measures in place in South Sudan, as coordinated through the GBV sub-cluster group.
- ❖ Moreover, contractors will maintain labor relations with local communities through a code of conduct (CoC), which commits all persons engaged by the contractor, including sub-contractors and suppliers, to acceptable standards of behavior.
- ❖ The CoC shall include sanctions (e.g., termination) for noncompliance, including non-compliance with specific policies related to GBV, SE and SH.
- ❖ The CoC shall be written in a language a worker better understands (for the expatriate worker, it will be usually in English) in a reader-friendly style and signed by each worker.
- ❖ For management of GBV/SEA/SH and related risks, the project should be sensitized communities, including children; on the possible causes and effects of gender-based violence, and how it can be avoided.
- ❖ A grievance management system suitable for GBV/SEA/SH related cases must be constituted and popularized the mechanisms through which incidences can be reported and resolved.

10 access to information and consultation; workers' accommodations

This includes the risk that access to information (data or programs) will be inappropriately granted or refused. Unauthorized people may be able to access confidential information, while simultaneously, authorized people may be denied access. Alternative people may be denied information because of their education, gender, or age.

Proposed mitigation measures

- ❖ Employee training to sensitise them on the importance of privacy of information.
- ❖ The project will have a strong onboarding process for physical assets being added to a network and ensure they don't give more access than needed to each asset.
- ❖ At community level, there should be use of appropriate language and visual Aids to ensure that information is understandable and usable for all concerned.

11. Workers' accommodations

The risks of workers' accommodation may include impacts on local housing market, impacts from disorderly behaviours that may affect community health, for example they can easily mingle with communities and abuse girls and women, they can increase incidents of thefts in the community and drunkenness, to mention a few.

Proposed mitigation measures

- ❖ Have workers camps located far from the community
- ❖ Control movements of workers
- ❖ Have a clear code of conduct, which is properly read and signed by all workers, protecting communities.
- ❖ For those who disobey rules, have stringent control measures to ensure compliance.

12 security of project workers

The conflict in South Sudan had resulted in the deaths of thousands of people and has had a devastating effect on many families. Some stakeholders are worried about the fragile security environment and wondering what will happen to the project if conflicts crop out.

Proposed mitigation measures

- ❖ Adequate Stakeholders consultation should be conducted throughout the project.
- ❖ Client should prepare a social assessment, a security risk assessment and security management plan, labor management procedure proportionate to the risks and impacts of the project.
- ❖ The project

13 Risks related to the hiring of security personnel

Improper management of security personnel in the context of development projects could threaten community health, safety and security. The most common risks could be associated with vandalism and petty crime, and a risk to young girls and women in terms of rape and sexual abuse.

Proposed mitigation measures

- ❖ Ensure a rigorous hiring process to select security personnel with good reputation and an impeccable track record.
- ❖ Ensure that companies have a code of conduct and provide training when necessary to clearly communicate what the desired behavior is and what actions will not be tolerated.
- ❖ Ensure an adequate supervision of security personnel
- ❖ Educate communities on the possible risks from the security personnel and how to avoid them.

7 ENVIRONMENTAL & SOCIAL MANAGEMENT AND MONITORING PLAN

To avoid, minimise or manage impacts that could be associated with the project and its attendant components, mitigation measures must be implemented to ensure compliance with South Sudan's legal requirements and the World Bank ESF. At the implementation stage, each project component (especially components 1 – 3) should have a sub-project/component ESMP that clearly details mitigation measures that are related to specific activities. A generic template outline of an ESMP is provided under Annexure IV.

Annexure X indicates the specific measures to be undertaken during the mobilisation and implementation of activities during the construction phase, operations phase and decommissioning phase respectively. It also included monitoring measures designed to ensure that compliance with the plans can be checked and recorded during implementation and assign responsibility for these actions. Tables 7.1 and 7.2 show the summary of an Environmental and Social Management Plan that will be useful for mitigating the key environmental and social impact and risks of the South Sudan Energy Sector Access and Institutional Strengthening Project.

Contractors shall prepare and submit construction Environmental and Social Management Plans which will include the management strategies indicated but not limited to those shown below: -

- Occupational Health and Safety Management Plan;
- Community Health and Safety Management Plan;
- Noise and Vibration Management Plans;
- Landscaping and Site Restoration Plan;
- Labor influx management plan;
- Waste management plan, with a more focus on hazardous wastes;
- Traffic safety management plan; and
- Emergency preparedness and response plan

Table 0.1: Summary of Environmental & Social Management Plan for Adverse impacts of the Juba grid densification & extension

| Impacts | Main Mitigation measures | Implementing body/Responsibility |
|---|--|----------------------------------|
| Construction phase | | |
| Selective clearance of vegetation and crops | <ul style="list-style-type: none"> ❖ Land clearance should be restricted to that which is required for the project components to minimize the loss of vegetation; ❖ Restrict vehicle movements to and from the project site(s) to the project access road – offroad driving should be prohibited; ❖ Site restoration should be undertaken for areas where temporary project infrastructure will be established during the construction phase. The affected areas should be restored, and only indigenous vegetation replanted. Intentional restoration using exotic plant species should be avoided; ❖ Sensitize workers against unnecessary destruction, trampling and clearance of flora/crops; ❖ Development of Biodiversity management plans when needed; and ❖ Implementing projects in protected areas and other critical habitats should be excluded | Contractors |
| Avian and Bat Collisions and Electrocutions | <ul style="list-style-type: none"> ❖ Transmission line corridors should be aligned corridors to avoid critical habitats (e.g., nesting grounds, heronries, rookeries, bat foraging corridors, and migration corridors); ❖ Maintaining 1.5-meter spacing between energized components and grounded hardware or, where spacing is not feasible, covering energized parts and hardware; ❖ Retrofitting existing transmission or distribution systems by installing elevated perches, insulating jumper loops, placing obstructive perch deterrents (e.g., insulated "V's"), changing the location of conductors, etc.; and ❖ Where necessary, Installing visibility enhancement objects such as marker balls, bird deterrents, or diverters. <p>Considering the proposed project where the powerline is insulated, this risk of electrocution expected to be none or minimal and no power line is pass through any known migratory bird routes.</p> | Contractors |

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| Introduction of invasive species | <ul style="list-style-type: none"> ❖ Potential sources of soil should first be inspected for the presence of invasive species and if any are found, these sources should not be excavated; and ❖ Invasive species should be monitored for sprout and if they appear along the access road or at the project site, they should be recorded and managed according to a prepared Invasive Species Management Plan; and ❖ Undertake revegetation of scarred project areas by using indigenous plant species that are preferably sourced from the immediate vicinity of the project area. | Contractors |
| Soil erosion | <ul style="list-style-type: none"> ❖ Site preparation should be undertaken in a systematic manner to reduce the risk of open ground to erosion; ❖ There should be controlled clearance of vegetation and this should be limited to only sections that are required for the establishment of project infrastructure; ❖ An efficient drainage system should be incorporated in the project design to cater for efficient and effective drainage of storm water from the project site and along the access road; ❖ Where possible, construction activities should not take place during heavy rain seasons; ❖ Disturbed areas should be rehabilitated using suitable indigenous cover grasses; and ❖ Landscaping of affected areas should be undertaken following completion of the construction phase to stabilize surfaces. | Contractors |
| Soil compaction and loss of soil functioning | <ul style="list-style-type: none"> ❖ Limit the project activities to the footprint of the required project area; ❖ Utilize vehicles with wide tires to minimize pressure exerted onto the ground; ❖ Prohibit off-road driving and parking outside of designated parking area; ❖ Stockpile the surface soil on the side of the project site for future use in landscaping; and ❖ Upon completion of work, the soil in any affected areas should be scarified to alleviate the effects of compaction. | Contractors |
| Soil contamination | <ul style="list-style-type: none"> ❖ Understanding the historical use of the land with regard to the potential presence of hazardous materials or oil prior to initiation of construction or decommissioning activities. ❖ All wastes generated during construction activities should be collected and disposed of appropriately at designated sites; ❖ Undertake monitoring of the soil quality and devise corrective action when changes attributed to project implementation have been observed; ❖ The waste management hierarchy should be followed during the construction phase. According to this hierarchy, source reduction of waste will be the first option and disposal of unavoidable waste as the option of the last resort; | Contractors |

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| | <ul style="list-style-type: none"> ❖ Undertake routine preventive maintenance of motorized equipment to avoid any fuel leakage and spills; and ❖ Storage of fuels and oils should be undertaken in a manner that does not allow leakage to the soil as the fuel can readily infiltrate the soils polluting the soils, ground and surface water. ❖ Preparing plans and procedures to respond to the discovery of contaminated media to minimize or reduce the risk to health, safety, and the environment. ❖ Preparation of a management plan to manage obsolete, abandoned, hazardous materials or oil. ❖ Managing contaminated media with the objective of protecting the safety and health of occupants of the site, the surrounding community, and the environment post construction or post decommissioning. | |
| Aquatic/terrestrial habitat alteration | <ul style="list-style-type: none"> ❖ Site power transmission poles and substations to avoid critical aquatic habitat (e.g., watercourses and wetlands; and ❖ Minimize the clearing and disruption of riparian vegetation. | Contractors |
| Spillage and leakages | <ul style="list-style-type: none"> ❖ Ensure that all transformers are placed on drip trays during transportation, prior to and after installation; ❖ Prepare and implement an Oil Spill Response Plan; ❖ Prepare and implement an Emergency Preparedness and Response Plan; ❖ Vehicle maintenance and servicing should be done only on purpose-built impervious concrete platforms with oil and grease traps; ❖ Undertake vehicle inspection using a pre-developed vehicle inspection checklist for all project vehicles; ❖ Ensure that there is a gazetted washing area for all project vehicles; ❖ Ensure that all project vehicles are maintained in good condition; ❖ Train project staff in the management of spills; and ❖ Establish secondary containment for any spills for the gazetted parking area of project vehicles | Contractors, MoED, PIU |
| Waste Management | <ul style="list-style-type: none"> ❖ Develop a Waste Management Plan prior to the commencement of the project; ❖ Non-hazardous metals and cables could be sold to authorized collectors and recyclers ❖ As there are no known facilities to dispose of hazardous waste in the country. The Contractor should consider designing a temporary hazardous waste storage facility in consideration of the generated amounts and timing before final disposal by licensed hazardous waste handlers in accordance with the national legislative requirements and world Bank ESF requirements and GIIP practices; | Contractors, MoED, PIU, licenced private company |

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| | <ul style="list-style-type: none"> ❖ Maximize the re-use of all excavated materials in the construction works. ❖ Disposal of surplus material (spoil) only at designated sites approved by the responsible local authority and only by approved methods. ❖ No spoil should be disposed of in wetlands, near watercourses and other important habits ❖ Contract a licensed hazardous waste handler to safely transport and dispose of hazardous waste; ❖ Capacitate and support licensed personnel who are involved in hazardous waste disposal and management in all aspects including financial and technical supports. ❖ Identify the potential waste streams to be generated by the project activities, and how best they can be managed; ❖ All wastes shall be properly disposed of in accordance with the national legislative requirements and in accordance with ESF requirements and GIIP practices | |
| Noise and vibrations effects | <ul style="list-style-type: none"> ❖ Excessive noise levels should be restricted to the daytime and working hours, and equipment producing high levels of noise should be avoided when working within proximity to any sensitive noise receptors; ❖ Ensure that equipment and vehicles when not in use, are switched off to avoid noise emission; ❖ If particularly noisy works are scheduled, the nearest sensitive receptors will need to be informed of the timing and duration of the nuisance; and ❖ Where possible, noise barriers should be employed to ensure that the maximum noise level at a 1m distance from a single source will not exceed nationally accepted permissible levels and World Bank's Environmental and Social Framework (ESF) requirements. | Contractors |
| Alteration of ambient air quality | <ul style="list-style-type: none"> ❖ Undertake dust control and suppression measures including the regular application of water on or near construction sites, settlement areas to reduce dust generation and observing traffic speed limits; ❖ Maintain all machinery and equipment in good working order to ensure minimum emissions; ❖ Install humps along the project roads as well as haulage routes to reduce the speed of trucks; ❖ Prohibit the burning of garbage in the workers' camp and along the roads; and ❖ Undertake timely servicing of vehicles so as to control the emission of gases from vehicles and equipment. | Contractors |
| Working at height on Poles | <ul style="list-style-type: none"> ❖ The project should have Environment, Health and Safety roles assigned to trained personnel; | Contractors |

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| | <ul style="list-style-type: none"> ❖ The project should have an Occupational Health and Safety Plan; ❖ Conducting Job risk assessments and instituting permit to work provisions for activities that are undertaken at a height; ❖ Activities at a height should only be undertaken by well trained personnel; ❖ Testing structures for integrity prior to undertaking work; ❖ Implementation of a fall protection program that includes training in climbing techniques and use of fall protection measures; inspection, maintenance, and replacement of fall protection equipment; and rescue of fall-arrested workers, among others; ❖ Hoisting equipment should be properly rated and maintained and hoist operators properly trained; and ❖ An approved tool bag should be used for raising or lowering tools or materials to workers on structures. | |
| Other Occupational Health and Safety Risks | <ul style="list-style-type: none"> ❖ Ensure safe handling and use of PPE; ❖ Ensure the availability and proper use of PPE by the contractors, laborer who are engaged in the construction, installation and operation and maintenance of the proposed project; ❖ Monitor regularly the use and availability of PPE and other protective tools and materials by the project coordination unit at all phases of the project; ❖ All workers entering the construction site must be equipped with PPE including goggles, safety, shoes, overalls, gloves, dust masks, among others. The PPE should be those that follow the international standards of PPE. ❖ ONLY competent workers and staff should be allowed to operate any machinery and equipment to reduce the incidents of accidents; ❖ During the construction, the project site should be completely sealed off and warning signs erected informing the public to keep off the construction site when construction is in progress; ❖ Personal protection gear applicable to the activities must be provided and its use made compulsory to all; ❖ Fire risks are possible due to improper storage facilities and lack of fire drill, and this requires provision of regular training and awareness creation to the workers; ❖ For any incidents of leakage or spill during installation, temporary containment structure is required to clean-up accidental spills; | Contractors |

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| | <ul style="list-style-type: none"> ❖ Provide regular OHS induction training for staffs before mobilization to work; ❖ Personal protection gear will be provided, and its use made compulsory to all. The entire workforce should be trained in the use of protective gear, handling of chemical products and acid storage cells, electric safety equipment, procedures for entering enclosed areas, fire protection and prevention, emergency response and care procedures; ❖ Training given to the employees should be backed by regular on- site training in safety measures; ❖ Machines and Equipment must be operated only by qualified staff and a site supervisor should be on site at all times to ensure adherence; ❖ The contractor must develop workers' Health and Safety Manual for which all the workers should be conversant with for response in case of accidents; and ❖ Cut trees to a height shall be as per the national standards, limit the ROW at the recommended width for both 33 kV and 15 kV. However, the undergrowth in the ROW should be allowed while only leaving a narrow strip to be completely cleared to allow stringing of the line conductors. | |
| Landscape and Visual Impact | <ul style="list-style-type: none"> ❖ Create community awareness on issues related to the project activities; ❖ Liaise with community members to ensure that access to the sites is restricted for the duration of the construction and installation of the transmission lines; ❖ All construction activities should be limited to the required project footprint; ❖ Journey management should be undertaken in order to ensure that only the necessary trips required for the construction activities are made; and ❖ Undertake landscaping of the project site and restoration of affected area following completion of the construction phase. | Contractors |
| Soil, groundwater, and surface water drainage | <ul style="list-style-type: none"> ❖ Place clear markers indicating stockpiling areas of excavated materials to restrict equipment and personnel movement, thus limiting the physical disturbance to land and soils in adjacent areas; ❖ Undertake routine maintenance of motorized equipment to avoid any fuel leakage and spills; ❖ Storage of fuels and oils should be undertaken in a manner that does not allow leakage to the soil as the fuel can readily infiltrate the soil polluting the soil, ground, and surface water; and ❖ All waste generated from project activities should be collected and disposed of following the relevant national laws and international industry best practices. | Contractors, MoED, PIU, licenced private company |

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| Conflict between Local and Migrant Workers | <ul style="list-style-type: none"> ❖ Involve, encourage, and maximize use of local skilled and unskilled labor provided that it is compatible with the contractor's skill requirements; and ❖ Ensure fair and transparent hiring and staff management procedures and culturally appropriate communication with local communities about available employment opportunities. | Contractors, MoED, PIU |
| Labour Influx | <ul style="list-style-type: none"> ❖ Develop and implement a Labour Influx management strategy; ❖ Develop and implement the Gender Based Violence Management Plan; ❖ Develop and implement a Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH) Management Plan; ❖ Develop and implement a grievance mechanism to address grievances from local stakeholders; and ❖ PIU shall ensure that an area/site specific assessment of GBV/SEA/SH risks is undertaken within subsequent project ESIAs/ESMPs and that prevention and response measures are put in place. | Contractors, MoED, PIU |
| Child labor, force labor and violence against children | <ul style="list-style-type: none"> ❖ Implementing and respecting national labor proclamation and international performance standards requirement. ❖ Working closely with local authorities to stop recommending underage children (18 years as a minimum age) for the project construction works. ❖ Private sectors and cooperatives, etc. in the project are not employing/engaging anyone under 18 years of age for work in relation to the project. ❖ The project should prepare a labor management procedure which provides guidelines to manage labor and working conditions including avoidance of child and forced labor. | Contractors, MoED, PIU |
| Increased traffic | <ul style="list-style-type: none"> ❖ Travel in convoys and at designated times to decrease and avoid peak travel/ movement times within Juba City; ❖ Journey-specific risk assessments which will include the identification of potentially sensitive receptors along the traffic routes should be conducted. For significant traffic movements, including transport of construction materials to site, any affected communities/residents along the route ❖ should be sensitized, and wherever possible, attempts made to undertake the traffic movements at the least busy times of day; ❖ When travelling in community areas, speed limits on transportation routes should be maintained at 40km/hr for light vehicles and 30km/hr for heavy vehicles; ❖ Only approved drivers should be allowed to operate vehicles; | Contractors |

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| | <ul style="list-style-type: none"> ❖ Construction materials should wherever possible, be preferentially sourced locally in a manner that reduces environmental and social impacts (e.g., transport distances) and maximizes local economic development opportunities; ❖ All roads should have clear and visible signage especially in community areas, around schools and hospitals to minimize the risk of accidents; ❖ Each road junction near the project sites should have a traffic controller or signal person to monitor and direct traffic flow; ❖ All staff should undergo an Environment, Health and Safety induction process which includes rules for safe driving, including speed limits in community areas; and ❖ Construction equipment should be maintained on site until the construction is complete to reduce on vehicle movement (Taking into consideration, their security). | |
| Poor sanitation due to improper waste management | <ul style="list-style-type: none"> ❖ All waste generated from construction activities should be properly collected and handled prior to disposal. Biodegradable, non-biodegradable, hazardous and non-hazardous wastes should be segregated accordingly during collection; ❖ All waste collected should be disposed of appropriately e.g., a licensed waste collector should be contracted to transport waste material from site to the designated disposal area; ❖ The on-site ablution facilities on campsites should be serviced on a regular basis; ❖ Anti-vermin safeguards (such as covering bins with lids) should be put in place; and ❖ Operations should aim to reduce, re-use and recycle waste in preference to disposal. | Contractors, MoED, PIU, licenced private company |
| Increased pressure on the social service sector | <ul style="list-style-type: none"> ❖ As give-back, the project may invest in rehabilitation of social service resources such as health centers, water sources among other, as part of Corporate Social Responsibility (CSR) initiatives in order to improve their availability for both the local community members and project workers; ❖ Adequate and appropriate sanitary facilities should be constructed for use by the construction workers at the construction site; ❖ A water source should be established to supply water demands for the project activities where a base camp is expected to be constructed; ❖ Hygiene and sanitation campaigns should be undertaken as a way of sanitation awareness in a bid to control outbreaks of diseases | Contractors, MoED, PIU, |

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| Increased spread of sexually transmitted diseases and other communicable diseases | <ul style="list-style-type: none"> ❖ Awareness and sensitization campaigns should be undertaken on the dangers of sexually transmitted diseases including HIV/AIDS and methods of spread and control. The HIV/AIDS awareness trainer should collaborate with local Non-Government Organizations (NGOs), Community Based Organizations (CBOs) and District Health Officers for sustainability and integration of activities into the existing structures of the local health institutions; ❖ The workforce should be provided with access to primary health care, insecticide-treated mosquito nets if they are housed in a project camp, prescriptions, prophylactics and basic testing for TB, and STDs including HIV/AIDS; ❖ The project should engage an NGO to prepare community institutions for any influx of in-migrants (for example, by developing by-laws and community policing systems for larger numbers of in-migrants); ❖ The project should provide support to local healthcare facilities through training of local healthcare professionals, regular supply of medical supplies and up to date equipment through Corporate Social Responsibility initiatives; ❖ The project should establish a community health Program including providing support to existing or new local programmes such as mother and child nutrition, community health awareness, HIV/AIDS awareness, hygiene and immunization, malaria control measures (indoor spraying of insecticides, personal protection measures, and control of mosquito larvae), and local Voluntary Counselling and Testing (VCT) programmes; and ❖ All Project workers should be inducted in relevant codes of conduct that minimize exposure to risky lifestyles including unsafe sex practices. | Contractors, MoED, PIU, health officers, |
| Operation phase | | |
| Avian and Bat collisions and electrocutions | <ul style="list-style-type: none"> ❖ Transmission line corridors should be aligned corridors to avoid critical habitats (e.g., nesting grounds, heronries, rookeries, bat foraging corridors, and migration corridors); ❖ Maintaining 1.5-meter spacing between energized components and grounded hardware or, where spacing is not feasible, covering energized parts and hardware; ❖ Retrofitting existing transmission or distribution systems by installing elevated perches, insulating jumper loops, placing obstructive perch deterrents (e.g., insulated "V's"), changing the location of conductors, etc.; and ❖ Where necessary, Installing visibility enhancement objects such as marker balls, bird deterrents, or diverters. | Contractors |

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| | <ul style="list-style-type: none"> ❖ Considering the proposed project where the powerline is insulated, this risk of electrocution expected to be none or minimal and no power line is pass through any known migratory bird routes. ❖ Demarcation and avoidance of areas of conservation of interest (high value, species, feeding or breeding sites, migration routes); ❖ Making power lines present less of an obstacle for birds to collide with and high-visibility markers should be installed to make the lines more visible to birds; ❖ To mitigate habitat disturbance and alteration as much as possible the size of the area to be cleared and used for the project should be minimized. ❖ Conducting bird mortality monitoring for further management of bird strikes and /collusions. | |
| Electric and Magnetic Fields (EMF) Impacts | <ul style="list-style-type: none"> ❖ Evaluate potential exposure to the public against the reference levels developed by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) ❖ Average and peak exposure levels should remain below the ICNIRP recommendation for General Public Exposure; ❖ Consider siting new facilities so as to avoid or minimize exposure to the public. Installation of transmission lines or other high voltage equipment above or adjacent to residential properties or other locations intended for highly frequent human occupancy, (e.g., schools or offices), should be avoided; and ❖ If EMF levels are confirmed or expected to be above the recommended exposure limits, application of engineering techniques should be considered to reduce the EMF produced by power lines, substations, or transformers. Examples of these techniques include: <ul style="list-style-type: none"> ➤ Shielding with specific metal alloys; ➤ Increasing height of transmission towers; and ➤ Modifications to size, spacing, and configuration of conductors. | Contractors |
| Noise and vibrations effects | <ul style="list-style-type: none"> ❖ Locate transformers away from human receptors, to the extent possible; and ❖ Apply noise barriers or noise-cancelling acoustic devices on the transformers. | Contractors |
| Working at height on Poles | <ul style="list-style-type: none"> ❖ Conducting Job risk assessments and instituting permit to work provisions for activities that are undertaken at a height; ❖ Testing structures for integrity prior to undertaking work; and ❖ Maintenance activities at a height should only be undertaken by trained personnel; | Contractors |
| Electrocution | <ul style="list-style-type: none"> ❖ Undertake risk assessments for powerlines that have been reported to be faulty; | Contractors |

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| | <ul style="list-style-type: none"> ❖ Assign works on faulty powerlines to competent personnel; ❖ Sensitize community members to avoid illegal connections to the grid. Additionally, information should be provided to communities to report any cases of fallen electric wires to the responsible authorities; and ❖ Issue the right PPE to personnel that will be tasked with works on faulty powerlines. | |
| Decommissioning phase | | |
| Lack of adequate rehabilitation | <ul style="list-style-type: none"> ❖ Landscape and plant indigenous plant species on areas that previously hosted access routes, pole sites and staging areas protect from soil erosion and bareness of areas | Contractors, MoED, PIU, |
| Introduction of invasive species | <ul style="list-style-type: none"> ❖ Invasive species can be monitored for sprout and if they appear along the access road or at the project site they will be recorded and managed according to the Invasive Species Management Plan of the Project. ❖ Care should be taken to ensure all equipment is properly cleaned to avoid introduction of invasive species at project site from trucks, and other equipment used during this phase | Contractors |
| Soil erosion | <ul style="list-style-type: none"> ❖ Reinstall soils and original drainage patterns of the area; ❖ Re-vegetate any areas used temporarily during construction; and ❖ No non-native species should be planted on-site. | Contractors |
| Soil compaction and loss of soil functioning | <ul style="list-style-type: none"> ❖ Driving outside the designated working areas should be prohibited to prevent soil compaction and habitat disturbance or destruction; and ❖ Upon completion of work, the soil in any affected areas should be scarified to alleviate the effects of compaction. | Contractors |
| Soil contamination | <ul style="list-style-type: none"> ❖ All organic waste generated at the project site such as food waste should be collected and managed responsibly; ❖ Undertake monitoring of the soil quality and devise corrective action when changes attributed to project implementation have been observed; ❖ Motorized equipment will undergo routine preventive maintenance of avoid any fuel leakage and spills; and ❖ All waste generated from decommissioning activities will be collected and disposed of in accordance with South Sudan's laws pertaining to waste disposal and management, the World Bank ESF requirements and international best practice. | Contractors, MoED, PIU, licenced private company |
| Aquatic/terrestrial habitat alteration | <ul style="list-style-type: none"> ❖ Ensure that waste disposal does not occur in aquatic habitats | Contractors |

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| Spillage and leakages | <ul style="list-style-type: none"> ❖ Analyze the type of gases present in the transformers and other insulated equipment associated with PCB and SF₆; ❖ Refurbishment of any substations and upgrading/rehabilitation work of the power line will need to check whether any such old transformers/equipment will be replaced, and appropriate safeguards (appropriate storage, decontamination, and disposal of contaminated units), taken; ❖ Prior to final disposal, retired transformers and equipment containing PCB should be stored on a concrete pad with curbs sufficient to contain the liquid contents of these containers should they be spilled or leaked; ❖ Contract a licensed hazardous waste handler to safely transport and dispose of hazardous waste containing PCB; ❖ Surrounding soil exposed to PCB leakage from retired equipment should be assessed, and appropriate removal and/or remediation measures should be implemented; ❖ The project should consider use of alternative vacuum circuit breaker technologies; and ❖ The project should consider use of alternative fluorinated gas mixtures if possible. | Contractors, MoED, PIU |
| Use of Wood Preservatives | <ul style="list-style-type: none"> ❖ Undertake appropriate disposal of used wooden poles that will be removed and replaced with concrete poles.; ❖ Landfill facilities should be capable of handling wastes that may have chemical leaching properties; and ❖ Disposal through incineration or through recycling should consider associated air emissions and secondary product residues of preservative chemicals. | Contractors, MoED, PIU |
| Waste Management | <ul style="list-style-type: none"> ❖ The project developer should have a decommissioning plan in place that addresses aspects of waste management. | Contractors, MoED, PIU |
| Alteration of ambient air quality | <ul style="list-style-type: none"> ❖ Make all reasonable efforts to suppress dust during earthworks. Specific actions may include continually watering dusty construction areas with a water bowser; ❖ Installation of humps along the project roads as well as haulage routes to reduce the speed of trucks; and ❖ Burning of garbage and any resultant waste in the workers' camp and along the roads should be prohibited. The waste should instead be responsibly disposed of. | Contractors |

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| Working at height on Poles | <ul style="list-style-type: none"> ❖ Conducting Job risk assessments and instituting permit to work provisions for activities that are undertaken at a height. | Contractors |
| Exposure to Polychlorinated biphenyls (PCBs) and SF6 Impacts | <ul style="list-style-type: none"> ❖ Analyze the type of gases present in the transformers and other insulated equipment associated with PCB and SF6. ❖ Refurbishment of any substations and upgrading/rehabilitation work of the power line will need to check whether any such old transformers/equipment will be replaced, and appropriate safeguards (appropriate storage, decontamination, and disposal of contaminated units) taken. ❖ Prior to final disposal, retired transformers and equipment containing PCB should be stored on a concrete pad with curbs sufficient to contain the liquid contents of these containers should they be spilled or leaked. ❖ Contract a licensed hazardous waste handler to safely transport and dispose of hazardous waste containing PCB; ❖ Surrounding soil exposed to PCB leakage from retired equipment should be assessed, and appropriate removal and/or remediation measures should be implemented ❖ The project should use alternative vacuum circuit breaker technologies; and ❖ The project should use alternative fluorinated gas mixtures if possible. | Contractors, MoED, PIU |
| Landscape and Visual Impact | <ul style="list-style-type: none"> ❖ Create community awareness on the related issues prior to decommissioning of temporary facilities; ❖ Liaise with community members to ensure that access to the project site is restricted for the duration of decommissioning until the site is restored close to its original state; and ❖ Limit the decommissioning activities to the project footprint; and ❖ Undertake re-vegetation in decommissioned areas. | Contractors |
| Noise and Ozone | <ul style="list-style-type: none"> ❖ Locate rights-of-way away from human receptors to the extent possible is a good mitigation measures at project planning stages. ❖ Use of noise barriers or noise canceling acoustic devices should be considered as necessary. | Contractors |
| Aircraft Navigation Safety | <ul style="list-style-type: none"> ❖ Consider aircraft navigation impact during the planning stage of power transmission tower. ❖ Avoiding the siting of transmission lines and towers close to airports and outside of known flight path envelopes; | Contractors |

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| | <ul style="list-style-type: none"> ❖ Consultation with regulatory air traffic authorities prior to installation; ❖ Adherence to regional or national air traffic safety regulations; and ❖ Use of buried lines when installation is required in flight sensitive areas. | |
| Soil, groundwater, and surface water drainage | <ul style="list-style-type: none"> ❖ Sensitize drivers to keep vehicles on defined tracks; and ❖ Undertake rehabilitation of excavated areas/formerly cleared sites/areas. | Contractors, MoED, PIU |
| Conflict between Local and Migrant Workers | <ul style="list-style-type: none"> ❖ Involve, encourage, and maximize use of local skilled and unskilled labor provided that it is compatible with the contractor's skill requirements; and ❖ Ensure fair and transparent hiring and staff management procedures and culturally appropriate communication with communities regarding employment opportunities. | Contractors, MoED, PIU |
| Labour Influx | <ul style="list-style-type: none"> ❖ Develop and implement a Labor Influx management strategy; ❖ Develop and implement the GBV management plan; ❖ Develop and implement the Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH) management plan; and ❖ Develop and implement a grievance mechanism to address grievances from local stakeholders. | Contractors, MoED, PIU |
| Increased traffic | <ul style="list-style-type: none"> ❖ should be sensitized, and wherever possible, attempts made to undertake the traffic movements at the least busy times of day; ❖ When travelling in community areas, speed limits on transportation routes should be maintained at 40km/hr for light vehicles and 30km/hr for heavy vehicles; ❖ Only approved drivers should be allowed to operate vehicles; ❖ Construction materials should wherever possible, be preferentially sourced locally in a manner that reduces environmental and social impacts (e.g., transport distances) and maximizes local economic development opportunities; ❖ All roads should have clear and visible signage especially in community areas, around schools and hospitals to minimize the risk of accidents; ❖ Each road junction near the project sites should have a traffic controller or signal person to monitor and direct traffic flow; | Contractors |

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| | <ul style="list-style-type: none"> ❖ All staff should undergo an Environment, Health and Safety induction process which includes rules for safe driving, including speed limits in community areas; and ❖ Construction equipment should be maintained on site until the construction is complete to reduce on vehicle movement (Taking into consideration, their security). | |
| Poor sanitation due to improper waste management | <ul style="list-style-type: none"> ❖ All waste generated from construction activities should be properly collected and handled prior to disposal. Biodegradable, non-biodegradable, hazardous and non-hazardous wastes should be segregated accordingly during collection; ❖ All waste collected should be disposed of appropriately e.g., a licensed waste collector should be contracted to transport waste material from site to the designated disposal area; ❖ The on-site ablution facilities on campsites should be serviced on a regular basis; ❖ Anti-vermin safeguards (such as covering bins with lids) should be put in place; and ❖ Operations should aim to reduce, re-use and recycle waste in preference to disposal. | Contractors |
| Increased pressure on the social service sector | <ul style="list-style-type: none"> ❖ As give-back, the project may invest in rehabilitation of social service resources such as health centers, water sources among other, as part of Corporate Social Responsibility (CSR) initiatives in order to improve their availability for both the local community members and project workers; ❖ Adequate and appropriate sanitary facilities should be constructed for use by the construction workers at the construction site; ❖ A water source should be established to supply water demands for the project activities where a base camp is expected to be constructed; ❖ Hygiene and sanitation campaigns should be undertaken as a way of sanitation awareness in a bid to control outbreaks of diseases | Contractors |
| Increased spread of sexually transmitted diseases and other communicable diseases | <ul style="list-style-type: none"> ❖ Awareness and sensitization campaigns should be undertaken on the dangers of sexually transmitted diseases including HIV/AIDS and methods of spread and control. The HIV/AIDS awareness trainer should collaborate with local Non-Government Organizations (NGOs), Community Based Organizations (CBOs) and District Health Officers for sustainability and integration of activities into the existing structures of the local health institutions; | Contractors |

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| | <ul style="list-style-type: none"> ❖ The workforce should be provided with access to primary health care, insecticide-treated mosquito nets if they are housed in a project camp, prescriptions, prophylactics and basic testing for TB, and STDs including HIV/AIDS; ❖ The project should engage an NGO to prepare community institutions for any influx of in-migrants (for example, by developing by-laws and community policing systems for larger numbers of in-migrants); ❖ The project should provide support to local healthcare facilities through training of local healthcare professionals, regular supply of medical supplies and up to date equipment through Corporate Social Responsibility initiatives; ❖ The project should establish a community health Programme including providing support to existing or new local programmes such as mother and child nutrition, community health awareness, HIV/AIDS awareness, hygiene and immunization, malaria control measures (indoor spraying of insecticides, personal protection measures, and control of mosquito larvae), and local Voluntary Counselling and Testing (VCT) programmes; and ❖ All Project workers should be inducted in relevant codes of conduct that minimize exposure to risky lifestyles including unsafe sex practices. | |
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Table 0.2: Adverse impacts of setting up mini-grids and off-grid Standalone solar systems

| Impacts | Main Mitigation measures | Implementing body/Responsibility |
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| Construction phase | | |
| Selective clearance of vegetation and crops | <ul style="list-style-type: none"> ❖ The project should have a Biodiversity Management Plan; ❖ Implementing sub project activities near protected areas and critical habitats should be avoided. ❖ Land clearance should be restricted to that which is required for the project components to minimize the loss of vegetation; ❖ Restrict vehicle movements to and from the project site(s) to the project access road – offroad driving should be prohibited; ❖ Site restoration should be undertaken for areas where temporary project infrastructure will be established during the construction phase. The affected areas should be restored, and only | Contractors |

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| | <p>indigenous vegetation replanted. Intentional restoration using exotic plant species should be avoided; and</p> <ul style="list-style-type: none"> ❖ Sensitize workers against unnecessary destruction, trampling and clearance of flora/crops. | |
| Avian and Bat Collisions and Electrocutions | <ul style="list-style-type: none"> ❖ Transmission line corridors should be aligned corridors to avoid critical habitats (e.g., nesting grounds, heronries, rookeries, bat foraging corridors, and migration corridors); ❖ Maintaining 1.5-meter spacing between energized components and grounded hardware or, where spacing is not feasible, covering energized parts and hardware; ❖ Retrofitting existing transmission or distribution systems by installing elevated perches, insulating jumper loops, placing obstructive perch deterrents (e.g., insulated "V's"), changing the location of conductors, etc.; and ❖ Where necessary, Installing visibility enhancement objects such as marker balls, bird deterrents, or diverters. ❖ Considering the proposed project where the powerline is insulated, this risk of electrocution expected to be none or minimal and no power line is pass through any known migratory bird routes. ❖ Demarcation and avoidance of areas of conservation of interest (high value, species, feeding or breeding sites, migration routes); ❖ Making power lines present less of an obstacle for birds to collide with and high-visibility markers should be installed to make the lines more visible to birds; ❖ To mitigate habitat disturbance and alteration as much as possible the size of the area to be cleared and used for the project should be minimized. | Contractors |
| Introduction of invasive species | <ul style="list-style-type: none"> ❖ Potential sources of soil should first be inspected for the presence of invasive species and if any are found, these sources should not be excavated; and ❖ Invasive species should be monitored for sprout and if they appear along the access road or at the project site, they should be recorded and managed according to a prepared Invasive Species Management Plan; and ❖ Undertake revegetation of scarred project areas by using indigenous plant species that are preferably sourced from the immediate vicinity of the project area. | Contractors |

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| Increased rates of soil erosion | <ul style="list-style-type: none"> ❖ Site preparation should be undertaken in a systematic manner to reduce the risk of open ground to erosion; ❖ There should be controlled clearance of vegetation and this should be limited to only sections that are required for the establishment of project infrastructure; ❖ An efficient drainage system should be incorporated in the project design to cater for efficient and effective drainage of storm water from the project site and along the access road; ❖ Where possible, construction activities should not take place during heavy rain seasons; ❖ Disturbed areas should be rehabilitated using suitable indigenous cover grasses; and ❖ Landscaping of affected areas should be undertaken following completion of the construction phase to stabilize surfaces. | Contractors |
| Soil compaction and loss of soil functioning | <ul style="list-style-type: none"> ❖ Limit the project activities to the footprint of the required project area; ❖ Utilize vehicles with wide tires to minimize pressure exerted onto the ground; ❖ Prohibit off-road driving and parking outside of designated parking area; ❖ Stockpile the surface soil on the side of the project site for future use in landscaping; and ❖ Upon completion of work, the soil in any affected areas should be scarified to alleviate the effects of compaction. | Contractors |
| Spillage and leakages | <ul style="list-style-type: none"> ❖ Vehicle maintenance and servicing should be done only on purpose-built impervious concrete platforms with oil and grease traps; ❖ Avoid leakages from vehicles and construction plant by regular and effective maintenance, and accidental spills through good practice by ensuring all equipment is in good condition, clean and free from leaks; ❖ Undertake vehicle inspection using a pre-developed vehicle inspection checklist for all project vehicles; ❖ Do not wash vehicles in wetlands, lakes, streams or rivers; ❖ In case of an oil spill or leaks, contaminated topsoil should be scooped and disposed of appropriately; ❖ Establish temporary and/or permanent waste spill containment structures; ❖ Prepare and implement emergency preparedness and response plans related to oil spill emergencies; ❖ Ensure that all equipment containing fluids such as generators and batteries are placed on drip trays during transportation and prior to installation; ❖ Establish secondary containment for any spills for the gazetted packing area for project vehicles; and ❖ Ensure that the fuel storage tanks have secondary containment. | Contractors, MoED, PIU |

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| Hazardous Materials | <ul style="list-style-type: none"> ❖ Due to the fact that most solar PV systems employ lead acid batteries, retrieval and recycling programs need to be incorporated to assure that the disposal of batteries does not result in environmental impact. Hence; ❖ These wastes should be collected, segregated and temporarily stored at designated waste disposal sites; ❖ As there are no known facilities to dispose of hazardous waste in the country. The Contractor should consider designing a temporary hazardous waste storage facility in consideration of the generated waste amounts and timing before final disposal by licensed hazardous waste handlers in accordance with the national legislative requirements and world Bank ESF requirements and GIIP practices; ❖ Procurement of electronic equipment from credible manufacturers with no or minimum adverse environmental impacts; ❖ Undertake trainings on waste management processes, awareness creation and sensitisation program for the proponent and end users about potential negative impacts; ❖ All wastes shall be properly disposed of in accordance with the national and international legislative requirements; and ❖ Capacitate and support licensed companies involved in hazardous waste management in all aspects including financial and technical supports where possible | Contractors, MoED, PIU, licenced private company |
| Waste Management | <ul style="list-style-type: none"> ❖ Personnel should aim to reduce, re-use, and recycle waste in preference to disposal; ❖ Undertake Proper waste segregation and storage; ❖ Provide solid waste handling facilities such as separate waste bins for biodegradable and non-degradable wastes until waste generated is disposed of at authorized dumping sites; ❖ Final domestic and/or other nonhazardous wastes, after proper segregation, should be disposed of safely at the designated waste disposal site; ❖ Maximize the re-use of all excavated materials in the construction works; ❖ Disposal of surplus material (spoil) only at designated sites approved by the responsible local authority and only by approved methods; ❖ No spoil should be disposed of in wetlands, near watercourses and other important habits; | Contractors, MoED, PIU, licenced private company |

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| | <ul style="list-style-type: none"> ❖ Conduct regular awareness creation, training and sensitization for the project proponent, workers and community reside in the area on the potential negative impacts, health and safety risks, of solid wastes, proposer waste management practices, and processes; ❖ All wastes shall be properly disposed of in accordance with the national legislative requirements and world Bank ESF requirements and GIIP practices; ❖ The contractor should engage a refuse handling company to remove the wastes from the site to the approved dumping site and authorised landfill sites; ❖ The contractor should erect warning signs against littering and dumping sites within the construction site; ❖ Excavated topsoil should be used as backfill by the contractor; and ❖ The contractor shall develop a waste management plan in line with the national policies, standards and guidelines as well as international standards, including World Bank Group Environmental, Health, And Safety (EHS) Guidelines GENERAL EHS GUIDELINES: Environmental Waste Management. | |
| Noise and vibrations effects | <ul style="list-style-type: none"> ❖ Prior notice/community awareness will be undertaken for the local community members to keep them informed of what will take place/schedules of the project activities so that they are able to plan accordingly; ❖ Construction activities will be limited to only daytime hours; ❖ Noise monitoring will be undertaken within the area and at nearby sensitive receptor sites during construction; ❖ Use of well-maintained and serviced equipment that generates low noise levels will be emphasized; ❖ Workers involved in construction activities will be provided with requisite Personal Protective Equipment; and ❖ Idling of machinery including vehicles will be prohibited unless necessary. | Contractors |
| Alteration of ambient air quality | <ul style="list-style-type: none"> ❖ Ensure construction equipment deployed at the project site is in good condition and routinely maintained to ensure they are efficient and emit relatively low exhaust fumes; ❖ Discourage open burning of waste; and ❖ Operate emission-producing equipment only when necessary and avoid unnecessary idling of equipment. | Contractors |

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| Working at height on Poles | <ul style="list-style-type: none"> ❖ The project should have Environment, Health and Safety roles assigned to trained personnel; ❖ The project should have an Occupational Health and Safety Plan; ❖ Conducting Job risk assessments and instituting permit to work provisions for activities that are undertaken at a height; ❖ Activities at a height should only be undertaken by well trained personnel; ❖ Testing structures for integrity prior to undertaking work; ❖ Implementation of a fall protection program that includes training in climbing techniques and use of fall protection measures; inspection, maintenance, and replacement of fall protection equipment; and rescue of fall-arrested workers, among others; ❖ Hoisting equipment should be properly rated and maintained and hoist operators properly trained; and ❖ An approved tool bag should be used for raising or lowering tools or materials to workers on structures | Contractors |
| Soil, groundwater, and surface water drainage | <ul style="list-style-type: none"> ❖ The construction contractors should develop environmental; health and safety (EHS) management plans which outline procedures for avoiding health and safety incidents and emergency medical treatment. This requirement should be achieved by making it as part of project contractual agreements; ❖ Introducing & implementing proactive preventive measures including minimizing the hazard: through design of safe work systems and administrative or institutional control measures such as training on safe work procedures, workplace monitoring, regular safety inspections, limiting exposure or work duration; ❖ Providing all necessary personal protective equipment (PPE) in conjunction with training, use, and maintenance of the PPE to the workers and enforce that PPEs are used for the safety and health of workers; ❖ The project implementation unit shall engage dedicated personnel competent on the basis of appropriate education, training, and experience to manage and oversee the health, safety and environment (HSE) aspects of the project; and ❖ The HSE personnel shall ensure that the project and contractors operate in accordance with the applicable national and international regulatory HSE requirements and plans; and also monitor implementation of environmental and social protection measures. | Contractors, MoED, PIU |

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| Soil, groundwater, and surface water drainage | <ul style="list-style-type: none"> ❖ Undertake routine preventive maintenance of motorized equipment to control oil leakages; ❖ Inspection of the condition of vehicles will be undertaken on a daily basis to ensure they are in good working condition and no leakages are registered. Equipment identified with any leakage will be repaired before being used again; ❖ As part of emergency preparedness, a spill contingency plan will be put in place and staff trained in the use of spill-cleaning equipment for proper management of fuel and chemical spillages; ❖ Secondary containment measures in areas where fuels, oils, lubricants, and construction materials such as cement are stored and loaded or unloaded, including fueling points will be installed; ❖ The onsite substation will be lined with sand to absorb any chemical spillages from equipment; ❖ In case of oil pollution, sedimentation and siltation, halt construction activities immediately and recover the pollutant before it reaches the receiving water sources. In addition, avoid washing construction equipment at the transfer station to avert pollution of receiving water sources; ❖ Design and install a septic tank system for human sanitary purposes; and ❖ Provide disposal facilities for wastes. | Contractors, MoED, PIU |
| Conflict between Local and Migrant Workers | <ul style="list-style-type: none"> ❖ Involve, encourage, and maximize use of local skilled and unskilled labor provided that it is compatible with the contractor's skill requirements; and ❖ Ensure fair and transparent hiring and staff management procedures and culturally appropriate communication with local communities about available employment opportunities. | Contractors, MoED, PIU, licenced private company |
| Labour Influx | <ul style="list-style-type: none"> ❖ Develop and implement a Labor Influx management strategy; ❖ Develop and implement the Gender Based Violence Management Plan; ❖ Develop and implement a Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH) Management Plan; ❖ Develop and implement a grievance mechanism to address grievances from local stakeholders; and ❖ PIU shall ensure that an area/site specific assessment of GBV/SEA/SH risks is undertaken within subsequent project ESIA/ESMPs and that prevention and response measures are put in place. | Contractors, MoED, PIU, licenced private company |
| Child labor, force labor and violence against children | <ul style="list-style-type: none"> ❖ Implementing and respecting national labor proclamation and international performance standards requirement. ❖ Working closely with local authorities to stop recommending underage children (18 years as a minimum age) for the project construction works. | Contractors, MoED, PIU |

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| | <ul style="list-style-type: none"> ❖ Private sectors and cooperatives, etc. in the project are not employing/engaging anyone under 18 years of age for work in relation to the project. ❖ The project should prepare a labor management procedure which provides guidelines to manage labor and working conditions including avoidance of child and forced labor. | |
| Increased traffic | <ul style="list-style-type: none"> ❖ Travel in convoys and at designated times to decrease and avoid peak travel/ movement times within the project area; ❖ Journey-specific risk assessments which will include the identification of potentially sensitive receptors along the traffic routes should be conducted. For significant traffic movements, including transport of construction materials to site, any affected communities/residents along the route should be sensitized, and wherever possible, attempts made to undertake the traffic movements at the least busy times of day; ❖ When travelling in community areas, speed limits on transportation routes should be maintained at 40km/hr for light vehicles and 30km/hr for heavy vehicles; ❖ Only approved drivers should be allowed to operate vehicles; ❖ Construction materials should wherever possible, be preferentially sourced locally in a manner that reduces environmental and social impacts (e.g., transport distances) and maximises local economic development opportunities; ❖ All roads should have clear and visible signage especially in community areas, around schools and hospitals to minimize the risk of accidents; ❖ Each road junction near the project sites should have a traffic controller or signal person to monitor and direct traffic flow; ❖ All staff should undergo an Environment, Health and Safety induction process which includes rules for safe driving, including speed limits in community areas; and ❖ Construction equipment should be maintained on site until the construction is complete to reduce on vehicle movement (Taking into consideration, their security). | Contractors |
| Increased pressure on the social service sector | <ul style="list-style-type: none"> ❖ As give-back, the project may invest in rehabilitation of social service resources such as health centers, water sources among other, as part of Corporate Social Responsibility (CSR) initiatives in order to improve their availability for both the local community members and project workers; ❖ Adequate and appropriate sanitary facilities should be constructed for use by the construction workers at the construction site; ❖ A water source should be established to supply water demands for the project activities where a base camp is expected to be constructed; and | Contractors |

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| | <ul style="list-style-type: none"> ❖ Hygiene and sanitation campaigns should be undertaken as a way of sanitation awareness in a bid to control outbreaks of diseases. | |
| Increased spread of sexually transmitted diseases and other communicable diseases | <ul style="list-style-type: none"> ❖ Awareness and sensitization campaigns should be undertaken on the dangers of sexually transmitted diseases including HIV/AIDS and methods of spread and control. The HIV/AIDS awareness trainer should collaborate with local Non-Government Organizations (NGOs), Community Based Organizations (CBOs) and District Health Officers for sustainability and integration of activities into the existing structures of the local health institutions; ❖ The workforce should be provided with access to primary health care, insecticide-treated mosquito nets if they are housed in a project camp, prescriptions, prophylactics and basic testing for TB, and STDs including HIV/AIDS; ❖ The project should engage an NGO to prepare community institutions for any influx of in-migrants (for example, by developing by-laws and community policing systems for larger numbers of in-migrants); ❖ The project should provide support to local healthcare facilities through training of local healthcare professionals, regular supply of medical supplies and up to date equipment through Corporate Social Responsibility initiatives; ❖ The project should establish a community health Programme including providing support to existing or new local programmes such as mother and child nutrition, community health awareness, HIV/AIDS awareness, hygiene and immunisation, malaria control measures (indoor spraying of insecticides, personal protection measures, and control of mosquito larvae), and local Voluntary Counselling and Testing (VCT) programmes; and ❖ All Project workers should be inducted in relevant codes of conduct that minimize exposure to risky life styles including unsafe sex practices. | Contractors |
| Vandalism of solar and mini-grid equipment | <ul style="list-style-type: none"> ❖ The PIU should work closely with the Ministry of National Security to provide security to the project infrastructure; ❖ Work with local government institutions in the hard-to-reach areas to provide security updates to the PIU; and ❖ Establish good working relations with local authorities and communities and encourage them to ensure the security of the solar equipment. | Contractors |
| Operation phase | | |

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| Electric and Magnetic Fields (EMF) Impacts | <ul style="list-style-type: none"> ❖ Evaluate potential exposure to the public against the reference levels developed by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) Average and peak exposure levels should remain below the ICNIRP recommendation for General Public Exposure; ❖ Consider siting new facilities so as to avoid or minimize exposure to the public. Installation of transmission lines or other high voltage equipment above or adjacent to residential properties or other locations intended for highly frequent human occupancy, (e.g., schools or offices), should be avoided; and ❖ If EMF levels are confirmed or expected to be above the recommended exposure limits, application of engineering techniques should be considered to reduce the EMF produced by power lines, substations, or transformers. Examples of these techniques include: <ul style="list-style-type: none"> ➤ Shielding with specific metal alloys; ➤ Increasing height of transmission towers; and Modifications to size, spacing, and configuration of conductors | Contractors |
| Working at height on Poles | <ul style="list-style-type: none"> ❖ Conducting Job risk assessments and instituting permit to work provisions for activities that are undertaken at a height; ❖ Testing structures for integrity prior to undertaking work; and ❖ Maintenance activities at a height should only be undertaken by trained personnel. | Contractors |
| Soil, groundwater, and surface water drainage | <ul style="list-style-type: none"> ❖ Regular and routine monitoring and maintenance will be undertaken to ensure that all project equipment is in good working condition at all times; and ❖ Regular maintenance of operations vehicles off-site thus minimizing the potential for leakages. | Contractors |
| Vandalism of solar and mini-grid equipment | <ul style="list-style-type: none"> ❖ Workers should be monitored, and proper work schedules designed so that workers undertake tasks where they have been deployed. | Contractors |
| Decommissioning phase | | |
| Introduction of invasive species | <ul style="list-style-type: none"> ❖ Invasive species can be monitored for sprout and if they appear along the access road or at the project site they will be recorded and managed according to the Invasive Species Management Plan of the Project. ❖ Care should be taken to ensure all equipment is properly cleaned to avoid introduction of invasive species at project site from trucks, and other equipment used during this phase. | Contractors |

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| Soil erosion | <ul style="list-style-type: none"> ❖ Reinstall soils and original drainage patterns of the area; ❖ Re-vegetate any areas used temporarily during construction; and ❖ No non-native species should be planted on-site. | Contractors |
| Soil compaction and loss of soil functioning | <ul style="list-style-type: none"> ❖ Driving outside the designated working areas should be prohibited to prevent soil compaction and habitat disturbance or destruction; and ❖ Upon completion of work, the soil in any affected areas should be scarified to alleviate the effects of compaction. | Contractors |
| Spillage and leakages | <ul style="list-style-type: none"> ❖ Ensure to have a decommissioning plan that covers aspects of spill control in place; and ❖ Ensure to place the batteries, and any other equipment with the potential for leakages on drip trays during disassembling and transportation. | Contractors, MoED, PIU, licenced private company |
| Hazardous Materials | <ul style="list-style-type: none"> ❖ These wastes should be collected, segregated and temporarily stored at designated waste disposal sites; ❖ As there are no known facilities to dispose of hazardous waste in the country. The Contractor should consider designing a temporary hazardous waste storage facility in consideration of the generated waste amounts and timing before final disposal by licensed hazardous waste handlers in accordance with the national legislative requirements and world Bank ESF requirements and GIIP practices. ❖ Procurement of electronic equipment from credible manufacturers with no or minimum adverse environmental impacts; ❖ Undertake trainings on waste management processes, awareness creation and sensitization program for the proponent and end users about potential negative impacts; ❖ All wastes shall be properly disposed of in accordance with the national and international legislative requirements; and ❖ Capacitate and support licensed companies involved in hazardous waste management in all aspects including financial and technical supports where possible. ❖ The project developer should have a decommissioning plan in place that addresses aspects of waste management. | Contractors, MoED, PIU, licenced private company |
| Waste Management | <ul style="list-style-type: none"> ❖ Personnel should aim to reduce, re-use, and recycle waste in preference to disposal; ❖ Undertake Proper waste segregation and storage; ❖ Provide solid waste handling facilities such as separate waste bins for biodegradable and non-degradable wastes until waste generated is disposed of at authorized dumping sites; | Contractors, MoED, PIU, licenced private company |

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| | <ul style="list-style-type: none"> ❖ Final domestic and/or other nonhazardous wastes, after proper segregation, should be disposed of safely at the designated waste disposal site; ❖ Maximize the re-use of all excavated materials in the construction works; ❖ Disposal of surplus material (spoil) only at designated sites approved by the responsible local authority and only by approved methods; ❖ No spoil should be disposed of in wetlands, near watercourses and other important habits; ❖ Conduct regular awareness creation, training and sensitization for the project proponent, workers and community reside in the area on the potential negative impacts, health and safety risks, of solid wastes, proposer waste management practices, and processes; ❖ All wastes shall be properly disposed of in accordance with the national legislative requirements and world Bank ESF requirements and GIIP practices; ❖ The contractor should engage a refuse handling company to remove the wastes from the site to the approved dumping site and authorised landfill sites; ❖ The contractor should erect warning signs against littering and dumping sites within the construction site; ❖ Excavated topsoil should be used as backfill by the contractor; and ❖ The contractor shall develop a waste management plan in line with the national policies, standards and guidelines as well as international standards, including World Bank Group Environmental, Health, And Safety (EHS) Guidelines GENERAL EHS GUIDELINES: Environmental Waste Management. | |
| Noise and vibrations effects | <ul style="list-style-type: none"> ❖ Prior notice/community awareness will be undertaken for the local community members to keep them informed of what will take place/schedules of the project activities so that they are able to plan accordingly; ❖ Construction activities will be limited to only daytime hours; ❖ Noise monitoring will be undertaken within the area and at nearby sensitive receptor sites during construction; ❖ Use of well-maintained and serviced equipment that generates low noise levels will be emphasized; ❖ Workers involved in construction activities will be provided with requisite Personal Protective Equipment; and | Contractors |

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| | ❖ Idling of machinery including vehicles will be prohibited unless necessary. | |
| Alteration of ambient air quality | <ul style="list-style-type: none"> ❖ Ensure construction equipment deployed at the project site is in good condition and routinely maintained to ensure they are efficient and emit relatively low exhaust fumes; ❖ Discourage open burning of waste; and ❖ Operate emission-producing equipment only when necessary and avoid unnecessary idling of equipment. | Contractors |
| Working at height on Poles | <ul style="list-style-type: none"> ❖ Conducting Job risk assessments and instituting permit to work provisions for activities that are undertaken at a height. | Contractors |
| Soil, groundwater, and surface water drainage | <ul style="list-style-type: none"> ❖ Undertake routine preventive maintenance of motorised equipment to control oil leakages; ❖ Inspection of the condition of vehicles will be undertaken on a daily basis to ensure they are in good working condition and no leakages are registered. Equipment identified with any leakage will be repaired before being used again; ❖ In case of oil pollution, sedimentation and siltation, halt demolition activities immediately and recover the pollutant before it reaches the receiving water sources; and ❖ Provide disposal facilities for wastes. | Contractors, MoED, PIU, licenced private company |
| Conflict between Local and Migrant Workers | <ul style="list-style-type: none"> ❖ Involve, encourage, and maximize use of local skilled and unskilled labor provided that it is compatible with the contractor's skill requirements; and ❖ Ensure fair and transparent hiring and staff management procedures and culturally appropriate communication with communities regarding employment opportunities. | Contractors, MoED, PIU |
| Labour Influx | <ul style="list-style-type: none"> ❖ Develop and implement a Labor Influx management strategy; ❖ Develop and implement the GBV management plan; ❖ Develop and implement the Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH) management plan; and ❖ Develop and implement a grievance mechanism to address grievances from local stakeholders. | Contractors, MoED, PIU |
| Increased traffic | <ul style="list-style-type: none"> ❖ Travel in convoys and at designated times to decrease and avoid peak travel/ movement times within the project area; ❖ Journey-specific risk assessments which will include the identification of potentially sensitive receptors along the traffic routes should be conducted. For significant traffic movements, including transport of | Contractors |

| | | |
|---|--|------------------------|
| | <p>construction materials to site, any affected communities/residents along the route should be sensitized, and wherever possible, attempts made to undertake the traffic movements at the least busy times of day;</p> <ul style="list-style-type: none"> ❖ When travelling in community areas, speed limits on transportation routes should be maintained at 40km/hr for light vehicles and 30km/hr for heavy vehicles; ❖ Only approved drivers should be allowed to operate vehicles; ❖ Construction materials should wherever possible, be preferentially sourced locally in a manner that reduces environmental and social impacts (e.g., transport distances) and maximises local economic development opportunities; ❖ All roads should have clear and visible signage especially in community areas, around schools and hospitals to minimise the risk of accidents; ❖ Each road junction near the project sites should have a traffic controller or signal person to monitor and direct traffic flow; ❖ All staff should undergo an Environment, Health and Safety induction process which includes rules for safe driving, including speed limits in community areas; and ❖ Construction equipment should be maintained on site until the construction is complete to reduce on vehicle movement (Taking into consideration, their security). | |
| Increase pressure on the social service sector | <ul style="list-style-type: none"> ❖ As give-back, the project may invest in rehabilitation of social service resources such as health centers, water sources among other, as part of Corporate Social Responsibility (CSR) initiatives in order to improve their availability for both the local community members and project workers; ❖ Adequate and appropriate sanitary facilities should be constructed for use by the construction workers at the construction site; ❖ A water source should be established to supply water demands for the project activities where a base camp is expected to be constructed; and ❖ Hygiene and sanitation campaigns should be undertaken as a way of sanitation awareness in a bid to control outbreaks of diseases. | Contractors |
| Increased spread of sexually transmitted diseases and other | <ul style="list-style-type: none"> ❖ The project should undertake awareness and sensitization campaigns on the dangers of sexually transmitted disease including HIV/AIDS and methods of spread and control. | Contractors, MoED, PIU |

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|-----------------------|--|--|
| communicable diseases | <ul style="list-style-type: none">❖ The HIV/AIDs awareness trainer should collaborate with local NGOs, CBOs and District Health Officers for sustainability and integration of activities into the existing structures of the local health institutions; and❖ Project workers should be inducted in relevant codes of conduct that minimize exposure to risky life styles including unsafe sex practices. | |
|-----------------------|--|--|

8 PUBLIC CONSULTATION, PARTICIPATION AND DISCLOSURE

8.1 Stakeholder mapping (identification and analysis)

8.1.1 Stakeholder identification

Stakeholder identification aims to establish which organisations and individuals, including vulnerable groups, may be directly or indirectly affected (*positively or negatively*) by the project or have an interest in it. Stakeholder identification is an on-going process that is regularly reviewed and updated throughout project planning and implementation.

The stakeholder identification process took into account:

- a) Organizations and individuals that are directly and or indirectly involved in or likely to be affected by the Project's operations in line with E&S management.
- b) Organizations or individuals that have fundamental interest in the Project's E&S management processes; and
- c) Organizations or individuals that have the potential to influence/contribute to E&S impacts in relation to the implementation of the Project.

Table 8.1 below summarises the key project stakeholders that were identified and their specific relevance to/interest in the Project

Table 0.1: Stakeholders identified during the ESMF preparation

| Stakeholder Group | Stakeholders | Interest and Influence on Project activities based on the Stakeholder Impact Matrix | Level of Engagement Required based on the Stakeholder Impact Matrix |
|--|--|---|---|
| Government Ministries | Ministry of Energy and Dams | High Influence/High Interest | In-depth engagement |
| | Ministry of Environment and Forestry | Medium Influence/High Interest | In-depth engagement |
| | Ministry of Finance and Economic Planning | High Influence/High Interest | In-depth engagement |
| | Ministry of Health | High Influence/High Interest | In-depth engagement. |
| | Ministry of Higher Education, Science and Technology | Medium Influence/High Interest | In-depth engagement |
| | Ministry of Lands, Housing and Urban Development | Medium Influence/High Interest | In-depth engagement |
| | Ministry of Humanitarian Affairs and Disaster Management | Medium Influence/High Interest | In-depth engagement |
| | Ministries of Foreign Affairs and International Cooperation | Medium Influence/High Interest | In-depth engagement |
| | Ministry of Internal Affairs | Medium Influence/High Interest | In-depth engagement |
| | Ministry of National Security | Medium Influence/High Interest | In-depth engagement |
| | Ministry of Gender, Social Welfare and Religious Affairs | Medium Influence/High Interest | In-depth engagement |
| | Ministry of Public Service and Human Resource Development | Medium Influence/High Interest | Focused engagement |
| | Ministry of Labour | Medium Influence/High Interest | Focused engagement |
| Regional Capital cities | Aweil, Wau, Rumbek, Yambio, Bor, and Malakal | Medium Influence/High Interest | Focused engagement |
| Selected social institutions | Hospitals, health care centres, secondary and primary schools as well as key economic hubs such as agricultural markets. | Medium Influence/High Interest | Focused engagement |
| Institutions of higher learning | a) The University of Juba; b) University of Upper Nile; and c) Catholic University of Juba. | Low Influence/low Interest | Information disclosure |

| | | | |
|--|---|----------------------------------|------------------------|
| Public facilities | Management of Government administration buildings and water supply facilities | Low Influence/High Interest | Focused engagement |
| Electricity Bodies/Utilities (Public and Private) | a) South Sudan Electricity Corporation (SSEC); b) Juba Electric Distribution Company (JEDCO); and c) Ezra Power and Elsewedy. | Medium Influence/High Interest | In-depth engagement |
| Refugee camps and host communities | Jamjang village and Maban county | Low Influence/High Interest | Focused engagement |
| Government of Uganda represented by Ministry of Energy and Mineral Development (MEMD) | Minister of Energy and Mineral Development | Medium influence/Medium Interest | Informed engagement |
| Government of Ethiopia | Government entities responsible for the energy sector | Medium influence/Medium Interest | Informed engagement |
| Development Partners (Financing Agencies) | World Bank, UN Agencies (UNHCR, UNICEF, UNDP), EU Mission in South Sudan, AfDB, FCDO | High Influence/High Interest | In-depth engagement |
| Renewable Energy Companies' | Solar Energy Companies | Low Influence/low Interest | Information disclosure |
| Civil Society Organisations | International Development NGOs, UN Agencies (UNHCR, UNICEF, and UNDP) National NGO's such as Young Positives and Men to Women | Medium Influence/Medium Interest | Focused engagement |
| Project Affected communities | Community members within the project area of influence. Vulnerable Groups and their representatives. | Low Influence/High Interest | Focused engagement |
| Media | Ministry of Energy and Dams, Ministry of Higher Education, Science and Technology, Ministry of Environment, World Bank, SSEC and National NGO's (Young Positives, and Men to Women) | Low Influence/low Interest | Information disclosure |

8.1.2 Stakeholder Mapping

Following identification of stakeholders, stakeholder mapping was undertaken to understand a stakeholder or stakeholder group's influence and potential interest in relation to the Project including, E&S management activities so that tailored consultation approaches could be developed.

- **Assessing Stakeholder Interest**

Stakeholder interest in this case is defined as the extent to which the interests of a stakeholder are affected by or affect the Project's E&S management activities. The stakeholders' interests in the Project may be legal, financial, social, scientific or technical. These interests can be either positive or negative and can lead to either an improvement or deterioration in the management of E&S aspects on the Project. Stakeholder interest was assessed using the criteria shown in Table 8.2.

Table 0.2: Assessing Stakeholder Interest

| Level of Interest | Definition |
|-------------------|---|
| High | The Project or its E&S management activities potentially have a significant positive or negative impact on the interests of the stakeholder. The impact is considered significant, and the stakeholders are highly sensitive to the impact. |
| Medium | The Project or its E&S management activities have a moderate positive or negative impact on the interests of the stakeholder. The impact is considered medium and stakeholders are moderately sensitive to the impact. |
| Low | The Project or its E&S management activities potentially have a minor positive or negative impact on the interests of the stakeholder. The impact is considered minor and stakeholders are not considered sensitive to the impact. |

- **Assessing Stakeholder Influence**

Stakeholder influence refers to the power that a stakeholder has over the Project's development process or E&S management activities and outcomes. Influence can be direct or indirect. Indirect influence is from a stakeholder's ability to influence others or their access to important information. Direct influence is their ability to directly affect decision-making through, for example, the issue of government approval and permitting decisions. The assessment is qualitative and based on the criteria presented in Table 8.3.

Table 0.3: Assessing Stakeholder Influence

| Level of influence | Definition |
|--------------------|---|
| High | The stakeholder or stakeholder group is considered highly influential and has the capacity to significantly impact the Project and its E&S management activities. |
| Medium | The stakeholder or stakeholder group is considered to have moderate influence and moderate capacity to influence the Project and its E&S management activities. |
| Low | The stakeholder or stakeholder group is isolated and has limited capacity to exert influence over the Project and its E&S management activities. |

Engagement methods were prioritized based on the stakeholders' **influence** and **interest** on the Project and its related E&S management activities (Table 8.4 below). The overall aim was to ensure that all stakeholders were identified and engagement approaches tailored in order to:

- Drive effective communication of information related to the Project;
- Support confirmation that information had been understood;
- Facilitate feedback from stakeholders; and

- Enable stakeholder input and participation in decisions affecting their activities.

High Influence/High Interest. This group primarily includes stakeholders such as MoED, Ministry of Environment and Forestry, Ministry of Finance and Economic Planning and Development Partners that are directly associated with the Project or its E&S management activities. The level of engagement for stakeholders in this category is *In-depth engagement*.

High Influence/Low Interest. This group includes local Non-Government Organisations. The level of engagement for stakeholders in this category is *Informed Engagement*.

Low Influence/High Interest. This group includes energy companies operating in South Sudan, Refugee camps and host communities, management of public facilities, Project Affected local communities and selected social institutions. The level of engagement for stakeholders in this category is *Focused Engagement*.

Low Influence/Low Interest. This group includes other project beneficiaries such as Institutions of higher learning (The University of Juba, University of Upper Nile and Catholic University of Juba). The level of engagement for stakeholders in this category is *Information Disclosure*.

Medium Influence/High Interest. This group includes; Ministry of Health, Ministry of Higher Education, Science and Technology, Ministry of Lands, Housing and Urban Development, Ministry of Humanitarian Affairs and Disaster Management, Ministries of Foreign Affairs and International Cooperation, Ministry of Internal Affairs, Ministry of National Security, Ministry of Gender, Social Welfare and Religious Affairs, Ministry of Public Service and Human Resource Development, Selected social institutions and Ministry of Labor. The level of engagement for stakeholders in this category is; *In-depth engagement*. **Medium influence/Medium.** This group includes; Government of Ethiopia and Government of Uganda represented by Ministry of Energy and Mineral Development (MEMD). The level of engagement for stakeholders in this category is *Informed engagement*.

Table 8.4 below highlights stakeholders or stakeholder groups that have been identified and mapped at this stage of the assignment. This is in relation to the Project and its related management of E&S aspects. The corresponding proposed level of engagement is indicated accordingly

Table 0.4: Stakeholder influence and project impact analysis matrix

| Stakeholder Group | Project Impacts | | | | | | Vulnerability | Influence over the Project | | | | | | Level of Engagement | | |
|---|-----------------|--------|-----|----------|--------|-----|---------------|----------------------------|-----|------|----------|-----|---|---------------------|-----|---------------------------------------|
| | Positive | | | Negative | | | | Positive | | | Negative | | | | | |
| | H | M | L | H | M | L | | H | M | L | H | M | L | | H | M |
| Ministry of Energy and Dams | High | | | | | Low | | | Low | High | | | | | | Inform/Consult/ Involve & Collaborate |
| Ministry of Environment and Forestry | High | | | | Medium | | | | Low | | Medium | | | Medium | | |
| Ministry of Finance and Economic Planning | | Medium | | | | Low | | | Low | High | | | | | | |
| Ministry of Health | High | | | | | Low | | | Low | High | | | | | | |
| Ministry of Higher Education, Science and Technology | | Medium | | | | Low | | | Low | | | Low | | | | |
| Ministry of Lands, Housing and Urban Development | | Medium | | | | Low | | | Low | | Medium | | | | | |
| Ministry of Humanitarian Affairs and Disaster Management | High | | | | | Low | | | Low | | Medium | | | | | |
| Ministries of Foreign Affairs and International Cooperation | | | Low | | | Low | | | Low | | Medium | | | | | |
| Ministry of Internal Affairs | | | Low | | | Low | | | Low | | Medium | | | | | |
| Ministry of National Security | High | | | | | Low | | Medium | | High | | | | | Low | |
| Ministry of Gender, Social Welfare and Religious Affairs | High | | | | | Low | High | | | High | | | | | Low | |
| Ministry of Public Service and Human Resource Development | High | | | | | Low | | | Low | | Medium | | | | | |
| Ministry of Labour | High | | | | | Low | High | | | High | | | | | Low | |
| Regional Capital Cities | High | | | | | Low | | | Low | | Medium | | | | | Inform/Consult/ Involve & Collaborate |

| Stakeholder Group | Project Impacts | | | | | | Vulnerability | | | Influence over the Project | | | | | | Level of Engagement |
|---|-----------------|---|---|----------|---|---|---------------|---|---|----------------------------|---|---|----------|---|---|---------------------------------------|
| | Positive | | | Negative | | | | | | Positive | | | Negative | | | |
| | H | M | L | H | M | L | H | M | L | H | M | L | H | M | L | |
| Selected social institutions | | | | | | | | | | | | | | | | Inform/Consult/ Involve & Collaborate |
| Institution of higher learning | | | | | | | | | | | | | | | | Inform/Consult/ Involve & Collaborate |
| Public facilities | | | | | | | | | | | | | | | | Inform/Consult/ Involve & Collaborate |
| Electricity Bodies/Utilities (Public) | | | | | | | | | | | | | | | | Inform/Consult/ Involve & Collaborate |
| Refugee camps and host communities | | | | | | | | | | | | | | | | Inform/Consult/Involve |
| Government of Uganda represented by MEMD | | | | | | | | | | | | | | | | Involve/Collaborate & Consult |
| Government of Ethiopia | | | | | | | | | | | | | | | | Involve/Collaborate & Consult |
| Development Partners (Financing Agencies) | | | | | | | | | | | | | | | | Inform/Consult/ Involve & Collaborate |
| Renewable energy companies | | | | | | | | | | | | | | | | Inform/Consult/ Involve & Collaborate |
| Civil Society organizations | | | | | | | | | | | | | | | | Involve/Collaborate & Consult |
| Project Affected local communities | | | | | | | | | | | | | | | | Involve/Collaborate/Consult & Empower |
| Academic Institutions | | | | | | | | | | | | | | | | Involve & Consult |
| Media | | | | | | | | | | | | | | | | Involve |

8.2 Stakeholder consultation during the preparation of the ESMF

Stakeholder consultations are pivotal with regards to:

- a) Sharing of information about the proposed project with relevant stakeholders;
- b) Securing the necessary stakeholder buy-in for the planned interventions;
- c) Identifying and verifying the significance of environmental, social and health impacts;
- d) Understanding the socio-economic dynamics of the operating environment;
- e) Shaping the decision-making process through inclusivity;
- f) Establishment of robust communication channels; and
- g) Laying a foundation for sustainable results.

The stakeholder consultation process was undertaken under three phases as highlighted in Table 8.5 below and further detailed in sections 8.2.1 and 8.2.2.

Table 0.5: Phases of stakeholder Consultation during the preparation of the ESMF

| Phases of Consultation | Objective | Key Activities | Key Outputs |
|---|--|---|--|
| Phase 1: Preparation of the ESMF / Collection of E&S data | To collect/attain Environmental and Social baseline information to update the ESMF. | Meetings with key stakeholder groups in Juba. | <ul style="list-style-type: none"> - Updated Draft ESMF Report; and - Records of engagement activities undertaken to date. |
| Phase 2: Disclosure of the ESMF | <p>To present the draft ESMF to the selected stakeholders.</p> <p>To obtain comments and input from stakeholders regarding the ESMF.</p> | Validation meeting/workshops with a wider stakeholder group. | <ul style="list-style-type: none"> - Final ESMF Report. |
| Phase 3: ESMF implementation stage | To provide stakeholders with details regarding the undertakings, routines, status and progress of the project. | Communication of project progress and other key aspects that should be highlighted to stakeholders. | <ul style="list-style-type: none"> - New/updated project information. |

8.2.1 Phase 1: Preparation of the ESMF / Collection of E&S data

The MoED team involved in development of the Environmental and Social Safeguards had meetings with government bodies (Ministry of Public Service and Human Resource Development; Ministry of Higher Education; The South Sudan Electricity Corporation (SSEC); Ministry of Labour; Ministry of Environment and Forestry; Ministry of Lands, Housing and Urban Development; and the Ministry of Gender and Social Welfare) as well as Donors/Development partners in South Sudan and representatives of Civil Society Organisations (“Young Positives” – youths living with HIV and AIDS, and “Men to women” – NGO empowering men to fight gender-based-violence) and representatives of the local media.

8.2.2 Phase 2: Disclosure of the ESMF

It is planned to organise a workshop with all stakeholder ministries and governmental bodies of South Sudan, where the MoED will present the work done on development of Environmental and Social Safeguards in mid-December 2022. This will help validating the developed documents by the relevant ministries (particularly Ministry of Environment & Forestry, Ministry of Gender and Social Affairs, Ministry of Lands, Housing and Urban Development and Ministry of Labour) and will ensure the buy-in from the Government of South Sudan.

A final validation workshop is planned for the second or third week of January 2023 during which the updated versions (following World Bank review) of the Environmental and Social Safeguards will be presented. It is hoped that this workshop will be open to a wider group of stakeholders. The validated documents can subsequently be disclosed on the Bank's website for further stakeholder input. Feedback received from stakeholders on the project impacts, mitigation and monitoring plans and other aspects will receive a response, and where appropriate, will be incorporated into the final version of the ESMF.

Key objectives of stakeholder consultation at this stage will be to:

- Provide stakeholders with an update on the project and details of the final project description;
- Provide stakeholders with a summary of the ESMF report findings;
- Provide stakeholders with details of the mitigation and enhancement measures proposed to minimise negative project impacts and maximise potential project benefits;
- Solicit stakeholder feedback on the accuracy of the ESMF impact assessment and the appropriateness of the mitigation measures; and
- Incorporate comments from stakeholders into the final ESMF report.

The ESMF will be disclosed via the following avenues:

- National and local media (radio and newspapers);
- Direct distribution to stakeholders by hand, post and email;
- World Bank and MoED websites; and
- Physical meetings held with stakeholders within the project area (s).

8.2.3 Phase 3: ESMF implementation stage

Engagement of stakeholders in this phase entails providing important details on the undertakings, routines, status and progress of the project. Key activities in this phase will involve tracking of commitments made to stakeholder groups and communicating progress made against these commitments on a regular basis. The methods and frequency of reporting to stakeholders is provided in Table 8.6 below.

Table 8.6: Methods and frequency of reporting to stakeholders during the ESMF implementation stage

| Reporting Party | Reporting Method | Stakeholder | Reporting Information | Frequency |
|--|--|--|---|--|
| Project Implementation Unit (PIU) | <ul style="list-style-type: none"> - Induction; - Toolbox talks; and - Via project tender information | <ul style="list-style-type: none"> • New groups of workers; and • Project contractors. | <ul style="list-style-type: none"> • Environmental and social project requirements; • EHS requirements; and • Grievance mechanism. | <p>From commence ment of project activities</p> <p>Monthly</p> |

| Reporting Party | Reporting Method | Stakeholder | Reporting Information | Frequency |
|-----------------------------------|---|---|---|---|
| PIU | Formal meeting | <ul style="list-style-type: none"> Government authorities and agencies; Local authorities; Local community members; and Project affected persons. | <ul style="list-style-type: none"> Project status/ progress; EHS requirements; and Grievance management progress. | Quarterly meeting |
| South Sudan Government Ministries | Print media | <ul style="list-style-type: none"> Project affected communities; NGOs; and General public. | <ul style="list-style-type: none"> Land acquisition plans; Project status /progress; and Grievance mechanism. | Bi-annually |
| PIU | Public Meeting; One-on-one meetings; and Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs) | Project Affected persons and communities. | <ul style="list-style-type: none"> Land acquisition plans; Project progress; Grievance management progress; Feedback on commitments; and Feedback on other issues affecting community members. | When need arises or monthly. Ad hoc or throughout the life of the project. |
| | Website and social media Press release | International Development NGOs and UN Agencies (UNHCR, UNICEF, UNDP, etc.); General public; and Other local and international stakeholders. | <ul style="list-style-type: none"> Project status; Changes and key issues; and Frequently Asked questions (FAQs). | When changes to the project occur or annually. |
| PIU | Monthly Progress reports | Local community members and project affected persons. | <ul style="list-style-type: none"> Grievances from the local communities. | Monthly |

8.3 COVID-19 protocol during stakeholder consultation activities

Stakeholder consultation activities were planned and aligned to COVID -19 prevention guidelines as issued by the South Sudan Government, Ministry of Health as well as internationally recognised health bodies such as the World Health Organisation (WHO). The COVID-19 protocol that was followed during the stakeholder consultations, entailed the following considerations:

- Identifying essential stakeholder engagement activities and assessing the purpose of the engagement activities and the desired outcomes;
- Prioritising critical engagement activities and considering virtual, hybrid²¹ and remote alternatives that best met the objectives of the planned activities;
- Analysing factors such as access to and quality of internet and electricity connectivity, use of social media platforms, mobile phone coverage, internet access, availability of mobile network providers and language barriers to provide a range of options to meet different stakeholders' needs; and
- Evaluating options for providing alternative secure channels for grievances to protect complainants against potential retaliation.

In the event of a physical meeting, a pre-engagement brief was to be considered to highlight to the participants, the precautions that have to be adhered to throughout the meeting. The precautions included:

- Social distancing (2m);
- Wearing a facemask by participants;
- Hand washing and/or sanitisation; and
- Temperature and COVID-19 symptom screening.

Where meetings could not be held outdoors, ensuring that meeting rooms have adequate ventilation (*high roofs, lots of unobstructed windows, fans – this applied to the national level consultations*).

8.4 Summary of key consultation findings

- Stakeholders reveal that the Civil servants in South Sudan are poorly paid, this would affect the project. Many have left the project even the trained workers due to joining private sector, while others have gone to outside countries. They recommended that these issues should get attention and great consideration during project implementation.
- The stakeholders have been asked about the retention plans to be succeed.
- The stakeholders have been worried about the type of Public Private Partnership (PPP) that may be engaged by the project informed that the current arrangement with JEDICO has left the consumers to bear the cost. Government was supposed to pay a certain portion, which they did not. They recommended that the PPP need to be clear.
- The stakeholders request the definition of overlapping roles and who managing person of the overlapping role.
- The people of South Sudan should be participated in discussion with the Ministry of Energy actively to build ownerships and to discuss public interest.
- They asked to be benefited from power access, including internet utilization with power.
- The stakeholders afraid that the fragile security environment, conflict, political economy and security problem might hinder the successful of the project.
- Stakeholder asked the type of energy (solar or hydropower) and recommended clean energy to be developed. They were also requested that the project will build on what is existing in the short run.
- The stakeholder was assured that they will be encouraged to engage actively in project activities.
- Stakeholders were consulted on potential land issues regarding the project. They reported that they do not anticipate any challenges.
- They informed to resolve settlement issues before the project, because there are about 60% informal settlement in Juba; more or less an organised informality. There should be no need for compensation because the lines pass through a demarcated area of the planned plots of land.

²¹ Physical meetings that were blended with virtual attendance of some participants.

9 GRIEVANCE REDRESS MECHANISM

A Grievance is a formal complaint by an individual or a group who believes that their interests have been, or may be affected adversely in a way that they consider inappropriate. Grievances can arise from a range of development-related activities such as land acquisition or breaches of community health, safety and security commitments causing death, damage or injury and GBV/SEA/SH complaints (details about GBV/SEA/SH management are presented in the GBV/SEA/SH Risk Assessment and Mitigation Plan). The project GM will include separate procedures to handle GBV/SEA/SH grievances and complaints, as outlined in the SEP.

Identifying and responding to grievances supports the development of positive relationships between project implementers and affected stakeholders.

It should be noted that the project workers have their own separate GRM under the labour management procedures.

A key requirement of the World Bank ESS10 is to respond to concerns and grievances of project-affected parties related to the environmental and social performance of the project in a timely manner.

Effective implementation of a grievance mechanism is crucial to the management of potential risks and impacts of the project. The Concerns and Grievance mechanisms procedure will be communicated by the PIU to all stakeholders throughout the lifetime of the project to ensure that stakeholders understand the process but also provide feedback and comments on whether it is effective and fit for purpose.

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

9.1. Grievance Channels

Stakeholders will be informed about the grievance mechanism throughout the project implementation through avenues such as public/community meetings, letters/ leaflets, and via the Project website. Resolutions may also be presented at the meetings.

Stakeholders will be able to lodge a grievance in person, by email, telephone or letter. Grievances may also be passed through local community leaders to the responsible project personnel.

9.2. Grievance Mechanism Procedure

The grievance mechanism will involve seven (7) stages that are highlighted below. Figure 9.1 shows the grievance mechanism process.

Stage 1: Grievance Identification

Stakeholders will be able to lodge grievances in writing using the grievance form (Annex IV). If a stakeholder is unable to submit a written grievance, they can submit it verbally and it will be recorded on their behalf by the project Implementation Unit (PIU) representatives or via a local community leader or grievance management committee members.

Stage 2: Registration and Categorisation

All grievances received will be recorded in the grievance log (Annex V). The grievance log will be developed in *Microsoft Excel* and will be used for logging, tracking and managing the grievance mechanism.

The significance of the grievance will be assessed, and the grievance will be categorised as:

- Low priority grievance: a local, isolated or one-off complaint;
- Medium priority grievance: widespread and/ or ongoing complaint, e.g., noise, vibration and dust during construction; and

- Critical priority grievance: potential for significant breach of the World Bank ESF, national legislation and international conventions that the government of South Sudan has ratified.

This categorisation will be updated and refined over the life of the project as required.

Table 9.1 outlines the process for responding to categories of grievances. The response timeframe refers to the time period for responding to a stakeholder's grievance and starting the process of resolving the grievance. PIU representatives will aim to close the grievance as far as possible within the response timeframes in Table 9.1, otherwise it is anticipated that PIU representatives will close out grievances within 30 days of receiving a grievance, in as much as possible.

Table 0.1: Grievance Categorisation and Response

| Grievance Priority | Description | Response Timeframe | Type of Action |
|------------------------------------|--|--|---|
| Low Priority Complaint | Local, isolated or one-off complaint. | Grievance response within 14 days. | PIU representatives to coordinate internal response to grievance. |
| Medium Priority Complaint | Widespread and/ or ongoing complaint, i.e., noise, vibration and dust. | Grievance response within 7 days. | PIU representatives to investigate complaint. |
| Critical Priority Complaint | Potential for significant breach of World Bank ESF, national legislation and international conventions that the government of South Sudan has ratified and/ or negative media attention. | Grievance response/action within 3 days. | PIU representatives arrange priority team to investigate the complaint as a matter of urgency. Project activities may be halted for the investigation and to allow mitigation measures to be determined. |

Stage 3: Acknowledgement

Upon submission of a grievance, regardless of the method used, stakeholders will receive a Letter of Acknowledgement (Annex VI) informing them that their grievance has been received and logged within 24 hours. Information on the next course of action and an indicative timeframe for resolution of the grievance will be provided.

Stage 4: Investigation and Consultation

Following assignment of a grievance by the PIU, an investigation will be conducted into the issue raised, including consultation with the concerned person/party to identify measures to resolve the grievance as appropriate.

Stage 5: Communication of Resolution

The outcome of the investigation will be communicated to the complainant and feedback will be requested on the resolution. All grievances will be responded to within the timeframes indicated in Table 9.1 above. This initial response will include a summary of what is planned and when it is likely to be implemented, or an explanatory note clarifying why action is not required. The response will be in writing, although a verbal response will also be provided where appropriate.

Stakeholders submitting the grievance will be asked to give their feedback on the proposed course of action. If the feedback is negative, negotiation meetings will be organised with the project stakeholders in order to reach agreement. All actions will be logged in the grievance form and the grievance log.

Stage 6: Recourse to a Third Party

If a resolution of the grievance cannot be achieved, the project will consider establishing an amicable resolution mechanism through the setting up of a Conflict Resolution Committee. The Committee will be made up of PIU and local authority representatives who will settle disputes amicably and manage complex grievance issues. If still unresolved, the dispute will ultimately be sent to the relevant government body.

Stage 7: Effectiveness Review

When corrective actions are agreed upon by the project and the complainant, the project will be responsible for ensuring that corrective actions are implemented. Stakeholders will be informed on the progress of the implemented corrective actions. If no further attention is required, then the PIU can close the grievance and record this in the grievance log. Final decisions and details of closed grievances will be approved and signed off by the PIU representatives.

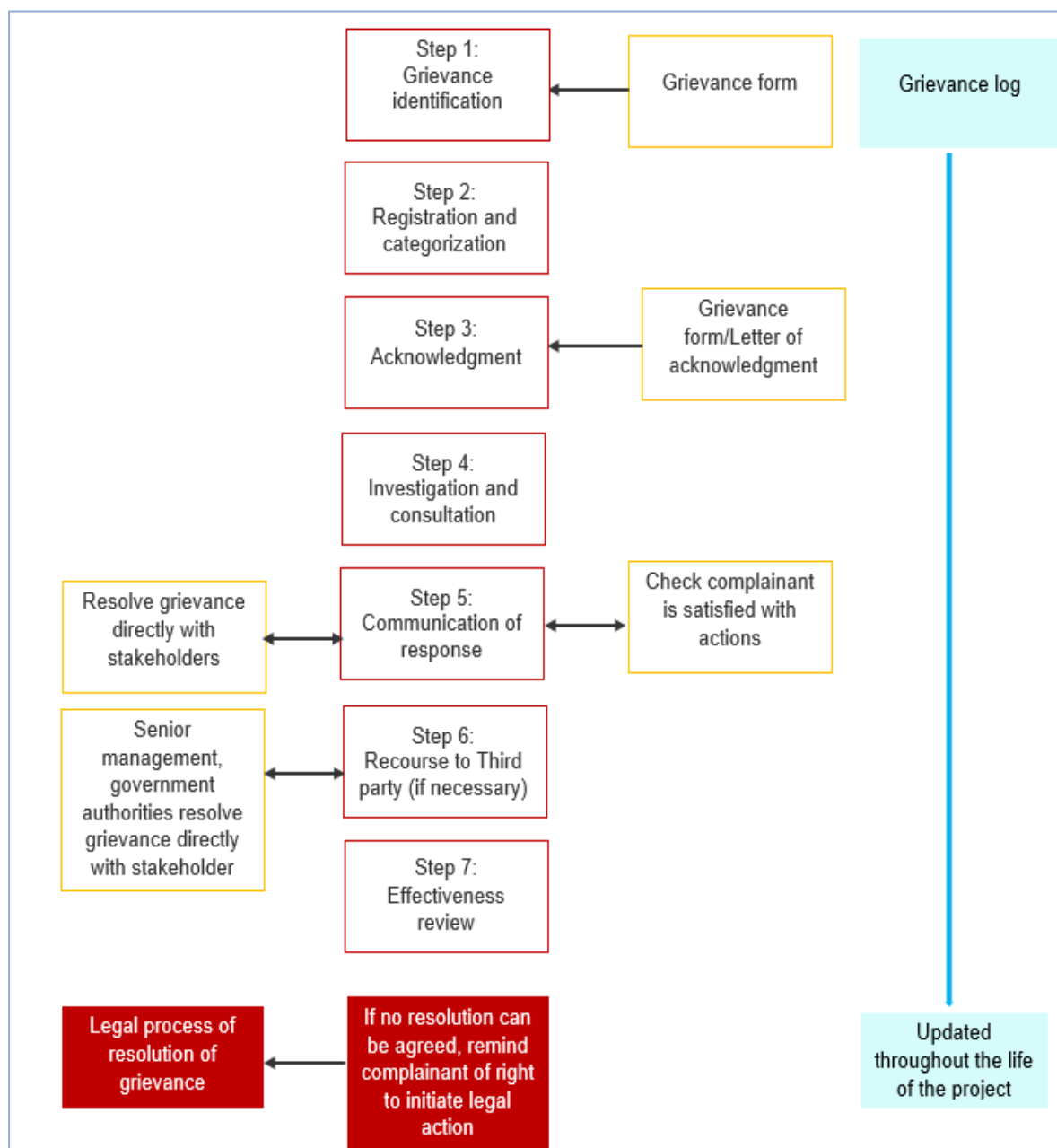


Figure 0.1: Grievance Flow Chart

Grievance Log

The Grievance Log will be filled out by the PIU representative who is responsible for tracking and managing grievances. Wherever possible, grievances will be logged as soon as they are received to ensure proper tracking and management of the grievance mechanism.

9.3 GRM Value Chain

Step 1: Grievance Uptake: Multiple channels must be available for aggrieved parties to file their complaint, grievance, or feedback. The aggrieved party must be able to select the most efficient institution, the most accessible means of filing a grievance, and must be able to circumvent partial stakeholders in the Project, which may be implicated in the complaint. He or she must further be able to bypass some grievance channels that are perceived as potentially not responsive or biased.

Means of Filing a Grievance

There are four distinct means, at least two of which must be made available at the project locality for people to file a grievance (for grievance form and register see Annex 1 and 2):

1. A phone number for a hotline operator: The phone number of a grievance hotline operator must be widely disseminated among project stakeholders. The Hotline Operator is available from 8.00 am to 5.00 pm every day through a toll-free number. The hotline operator is set up and managed by the PMU. Any concerned party can call the hotline number and file a grievance with the Project.
2. A help desk must be set up by the respective IP during the implementation of sub-project activities in an area. It should be manned by the implementing staff, especially its community liaison officers, in close coordination with local authorities. At the help desk, PAPs can inquire about information in regard to project activities, or they can file a grievance directly with the person manning the desk.
3. Relevant assigned personnel available in each project site will be required to accept formal grievances and ensure that avenues for lodging grievances are accessible to the public and all PAPs. The first point of contact for all potential grievances from community members may be the contractor, implementing partner or the local government official. Such personnel will be required to accept formal grievances; or they can point out the Hotline Operator's number, the Help Desk or Suggestion Box. If no reasonable other modality of filing a grievance is available for the respective complainant, the staff has to accept and register the grievance.
3. A suggestion box must be installed at the nearest Boma or Payam office of the sub-project site. Suggestion boxes provide a more anonymous way of filing a grievance or for providing feedback. Grievances or feedback submitted to the Suggestion Box must be expressed in writing.

9.4 GBV/SEA/SH-related Grievance

Given the sensitive nature of GBV complaints, the GRM provides different ways to submit grievances. All grievance uptake channels can be used to report on GBV/SEA/SH-related grievances. No grievance uptake mechanism can reject such grievances, and all personnel directly receiving grievances will be trained in the handling and processing of GBV/SEA/SH-related grievances. Information on relevant legislation will be delivered to survivors prior to any disclosure of case details, for example through initial awareness raising sessions on the GRM. This will allow protect the survivor-centered approach from mandatory reporting.

The GBV survivor has the freedom and right to report an incident to anyone: community member, project staff, GBV case manager, local authorities. All recipients of the report should – with the survivor's informed consent – report the case to one of the Project's formal grievance recipients. Furthermore, a survivor can ask someone else to act as a survivor advocate and report on her/his behalf.

Cases of GBV/SEA/SH can be reported through the general Project GRM – any project staff, staff manning help desks, through the suggestion box, or through the GRM Hotline Operator.

The grievance recipient will be responsible for the recording and registration of the complaint. A GRM operator cannot reject a GBV/SEA/SH complaint. At the same time, however, the project can only respond to a GBV/SEA/SH complaint if it is directed into the designated GRM channels.

Confidentiality: All grievance recipients and anyone handling the GBV/SEA/SH related grievances must maintain absolute confidentiality in regard to the case. Maintaining confidentiality means not disclosing any information at any time to any party without the informed consent of the person concerned. There are exceptions under distinct circumstances, for example a) if the survivor is an adult who threatens his or her own life or who is directly threatening the safety of others, in which case referrals to lifesaving services should be sought; b) if the survivor is a child and there are concerns for the child's health and safety. The survivors need to be informed about these exceptions.

Informed Consent: The survivor can only give approval to the processing of a case when he or she has been fully informed about all relevant facts. The survivor must fully understand the consequences of actions when providing informed consent for a case to be taken up. Asking for consent means asking the permission of the survivor to share information about him/her with others (for instance, with referral services and/or IPs), and/or to undertake any action (for instance investigation of the case). Under no circumstances should the survivor be pressured to consent to any conversation, assessment, investigation or other intervention with which she does not feel comfortable. A survivor can also at any time decide to stop consent. If a survivor does not consent to sharing information, then only non-identifying information can be released or reported on. In the case of children, informed consent is normally requested from a parent or legal guardian and the children.

9.4.1 Incident reporting

Severe incidents (defined as an incident *that caused significant adverse effect on the environment, the affected communities, the public or workers*, for example: Fatality, GBV, forced or child labor) will be reported within 48 hours to the PMU and the World Bank.

For all other grievances, the respective IP at the state level will decide whether the grievance can be solved locally, with local authorities, implementers, or contractors and whether an investigation is required. The first ports of call will have in-depth knowledge of communal socio-political structures and will therefore be able to address the appropriate individuals if the case can be solved at the local level.

At all times, the IP will provide feedback promptly to the aggrieved party, for example through the phone or through the community facilitator. Feedback is also communicated through stakeholder meetings and beneficiary meetings during project activities. For sensitive issues, feedback is given to the concerned persons bilaterally.

Records of all feedback and grievances reported will be established by the implementing partner or the PMU. All feedback is documented and categorized for reporting and/ or follow-up if necessary. For all mechanisms, data will be captured in an excel spreadsheet. The information collected, where possible, should include the name of the person providing feedback as well as the boma, payam and county, cooperating partner (where applicable), the project activity and the nature of feedback or complaint.

Step 2: Sort and Process: All registered grievances will be transferred to the GRM Focal Point at the respective PMU at state or national level – either by the Hotline Operator, local personnel, or the Help Desk Officer. The GRM focal point will categorize the complaint. Worker-related grievances will be handed over to a workers' GRM. Where grievances are of sexual nature and can be categorized as GBV/SEAH or child protection risk, the focal point has to handle the case appropriately, and refer the case to the GBV reporting protocols and referral system, defined in the GBV/SEAH and Child Protection Prevention and Response Plan. Dedicated training on how to respond to and manage complaints related to GBV/SEAH will be required for all GRM operators and relevant project staff.

For grievances handled under the general Project GRM, the GRM Focal Point will determine the most competent and effective level for redress and the most effective grievance redress approach. The focal point will further assign timelines for follow-up steps based on the priority of the grievance, and make a judgment and reassign the grievance to the appropriate staff or institution. The person will exclude grievances that are handled elsewhere (e.g. at the court). The focal point should offer the complainant option/s for resolution of their grievance.

The GRM Focal Point will also transfer the grievance information into a more comprehensive grievance register.

9.4.2 GBV/SEA/SH

All reporting will limit information in accordance with the survivor's wishes regarding confidentiality and in case the survivor agrees on further reporting, information will be shared only on a need-to-know-base, avoiding all information which may lead to the identification of the survivor and any potential risk of retribution (for a GBV/SEA grievance form see Annex IV).

Data on GBV cases recorded will only include the nature of the complaint (what the complainant says in her/his own words), whether the complainant believes the perpetrator was related to the project and additional demographic data, such as age and gender, will be collected and reported, with informed consent from the survivor. If the survivor does not wish to file a formal complaint, referral to available services will still be offered even if the complaint is not related to the project, that referrals will be made, the preference of the survivor will be recorded, and the case will be considered closed.

If the survivor provides informed consent, the grievance recipient should inform the GBV Focal Point. The GBV Specialist at the PMU will inform the World Bank. The report will be on the anonymized incident as soon as it becomes known to the PMU. Data shared will include the nature of the allegation; if the alleged perpetrator is associated with the Project; the survivor's age and sex' and whether the survivor was referred to other services.

Step 3: Acknowledgement and Follow-Up: The respective implementer or the PMU will decide whether a grievance can be solved locally, with local authorities, contractors, or NGOs, and whether an investigation is required. The first ports of call will have in-depth knowledge of communal socio- political structures and will therefore be able to recommend to the GRM Focal Point the appropriate individuals that could be addressed with the case, if the case can be solved at the local level.

At all times, the implementer or the PMU (the GRM Focal Point) will provide feedback promptly to the aggrieved party (unless the case was filed anonymously), within 5 working days after the grievance is filed. Feedback can be provided through the phone, in writing or through the community facilitators. Feedback is also communicated through stakeholder meetings and beneficiary meetings during Project activities. For sensitive issues, feedback is given to the concerned persons bilaterally.

GBV/SEA/SH

Referrals are a process through which the survivor gets in touch with professionals and institutions regarding her case. Services can include health, psycho-social, security and protection, legal/justice, and economic reintegration support. The grievance recipient will instantly provide the survivor with contacts of the available referral services in the respective area. If the survivor wishes for any assistance with transport or payment for services, the grievance recipient will provide allowances. Referral services are provided even in cases, where the survivor opts to not pursue the case through the GRM or through legal channels.

The grievance recipient explains to the survivor his or her right to control whether and how information about the case is shared with other entities as well as any implications of sharing information. The survivor

will be informed about his or her right to place limitations on the type of information they want shared. The survivor's consent must be documented.

Step 4: Verify, Investigate and Act: The GRM Focal Point, will then undertake activity-related steps in a timely manner. The activities will include: verifying, investigating, redress action and plan.

Verification:

- Check for eligibility (objectively based on set standards and criteria) of complaint in terms of relevance to the project.
- Escalate outright grievances that require high level interventions within the implementer or PMU
- Refer outright grievances that are outside the project jurisdiction (e.g. refer to PMU or relevant external institution)

Once eligibility is determined, the IP will categorize the complaint into defined categories:

Investigation:

- GRM Focal Point to appoint an independent investigator (safeguards experts, professional outside the Implementing institution) who is a neutral investigator with no stake in the outcome of the investigation
- Collect basic information (reports, interviews with other stakeholders while ensuring triangulation of information, photos, videos)
- Collect and preserve evidence
- Analyze to establish facts and compile a report.

Grievance Action Plan

- Based on the findings determine the next steps and make recommendations: (i) direct comprehensive response and details of redress action; (ii) referral to the appropriate institution to handle the grievance, where the IP has no jurisdiction
- undertake mutually agreed follow-actions
- Update of complainant
- Provide users with a grievance redress status update and outcome at each stage of redress, (iii) update the IP team on grievance redress across the GRM value chain.

GBV/SEA/SH

The PMU GBV and Gender Specialist will be the key focal point for management of such grievances and concerns and will work closely with respective GBV Specialist counterparts at the implementers in the implementation of the GBV/SEA/SH Action Plan, which contains all information on the GBV/SEA/SH referral system.

Once a case has been taken in by a GRM recipient, and informed consent of the survivor is obtained to proceed with the case, the case file will be submitted to the SCRP GBV Specialist. The GBV Specialist will first ensure that the survivor has been provided with all necessary GBV referral services, and will ensure that the survivor is in safety.

Where the GBV/SEA/SH grievance was allegedly committed by a project worker, the grievance will be reported to the respective employing agency. The PMU GBV Specialist will follow up and determine jointly with the GRM Focal Point of the respective partner the likelihood that the allegation is related to the project. The GBV Specialist will follow up and ensure that the violation of the Code of Conduct is handled appropriately, e.g. the worker is removed from his or her position and employment is ended. The responsibility to implement any disciplinary action lies with the employer of the perpetrator, in accordance with local labor legislation, the employment contract, and the code of conduct. The GBV Specialist will report back to the survivor on any step undertaken and the results.

Where the survivor has opted to take a formal legal route with the case, the PIU GBV Specialist will ensure that the survivor has all the support required to file a case at court. The GRM process will still proceed with the survivors' consent. Ensuring due process is a matter of the formal justice system and not the grievance handlers. Unlike other types of issues, it is not part of the GRM's remit to conduct investigations, to make any announcements, or to judge the veracity of an allegation. The GRM should refer the case to the domestic regulatory framework to process the case if the consent of the survivor is received.

Since this project assumes a fully survivor-centered approach, no information can be passed on without the consent of the survivor. If the survivor does not wish for the case to be pursued, the survivor shall be offered access to referral services and the GRM operator or grievance recipient should note that the survivor did not wish for the case to be pursued, and the case is considered solved.

Case closure requires a) the case has been referred to GBV service providers (if the survivor consented) for support and appropriate actions; and appropriate actions have been taken against the perpetrator according to SEA mechanisms; b) the service provider has initiated accountability proceedings with the survivor's consent.

If the survivor does not want to launch a complaint with the employer, the case is closed. If the complaint proceeds, the case is reviewed by the PMU GBV Specialist and a course of action is agreed on with the respective IP/employer. The alleged perpetrator's employer takes agreed-on disciplinary action. Once the action is deemed appropriate by the GBV Specialist, the case is recorded as closed.

Step 5: Monitor, Evaluate and Provide Feedback: The GRM Focal Point will provide feedback to GRM users and the public at large about:

- results of investigations;
- actions taken;
- why GRM is important;
- enhance the visibility of the GRM among beneficiaries; and
- increase in users' trust in the GRM

Any implementer will report on its GRM to the PMU on a monthly basis. Monthly reporting to the PMU should provide information on the grievance and how it was handled as well as all information from the grievance register. However, it can omit the names of the aggrieved parties where necessary.

The PMU will undertake the following monitoring actions:

- develop indicators for monitoring the steps of GRM value chain;
- track grievances and assess the extent to which progress is being made to resolve them;
- conduct a stakeholder satisfaction survey for the GRM services
- conduct analysis on the raw data on the following: average time to resolve grievances, percentage of complainants satisfied with action taken, and number of grievances resolved at first point of contact
- provide a report on grievance redress actions pertaining to the steps of GRM value chain

The PIU will evaluate the GRM by

- analyzing grievance data to reveal trends and patterns,
- sharing GRM analysis in management meetings; and
- taking corrective action on project implementation approaches to address the grievance

GBV/SEA/SH

All entities reporting on GBV/SEA/SH-related cases will ensure that reports do not contain any information with the potential of identifying survivors (including names of survivors, families and perpetrators).

Furthermore, the grievance recipient needs to provide ongoing feedback to the survivor throughout the process. After conclusion of any investigation, the survivor must be informed first to determine whether the perpetrator can be informed and proposed sanctions against the perpetrator can be taken.

10 MONITORING AND EVALUATION

Monitoring environmental and social aspects on the project provides for continuous assessment of compliance with the WB ESF and national requirements. This is in line with propagating continuous improvement on the project.

10.1 Monitoring schedule and reporting obligations

A multi-sectoral approach to monitoring the project will be adopted. The approach will involve entities that have an interest in the implementation of E&S aspects on the project such as: ministries, government agencies, lower tier governments, donor agencies, UN agencies and national NGO's. The monitoring schedule will entail daily, weekly, monthly, quarterly and annual monitoring and reporting routines. MoED will ensure that monitoring reports prepared are shared with relevant stakeholders including the WB.

10.1.1 Monitoring during construction

During the implementation of project activities, hired E&S consultants together with personnel from the MoED, will be responsible for monitoring and ensuring that the E&S mitigation/enhancement measures – which include health and safety measures, are being implemented. Besides general monitoring activities, important environmental parameters to be monitored should include: noise levels and dust suppression, waste generation, water and soil quality, vibration, accidents, incidents and near misses, biodiversity considerations, sexual abuse and exploitation (rape, defilement, Gender Based Violence and Violence against Children).

The schedule and frequency to be adopted for monitoring will entirely be based/depend on the subproject being undertaken. Subproject activities that have been determined to have medium – or high – risk impacts will require more stringent monitoring. When monitoring is done, a report should be prepared by the MoED to facilitate reporting to the PIU, based on the template provided in Annex IX. Contractors undertaking works shall be required to include EHS aspects in their routine progress/monitoring reports as required by their contracts.

10.1.2 Monitoring during operation

During the operational phase, monitoring of environmental parameters will be required for subproject activities.

10.2 Monitoring and performance indicators

The evaluation of results of implementation of environmental and social mitigation measures can be carried out by comparing data that was collected at the baseline stage in the initial project planning phases, with targets and post project phases. A number of performance indicators have to be used to determine the status of project affected people, stakeholders and the project host biophysical environment. The key performance indicators are number of complaints, number of hazardous waste management licensed companies involved, Type & number of waste handling facilities, developed waste management plan (WMP) and hazardous waste handling and disposal protocol, Contractor's EHS plan document, number & type of PPE distributed, Spill response plan prepared, awareness given to the employees involved in maintenance of equipment's and developed emergency preparedness and response plan.

To assess whether the project goals have been/were met, the PIU will assign E&S personnel who will highlight the parameters to be monitored, institute monitoring milestones and provide resources to carry out the monitoring activities.

Highlighted below, are some pertinent questions to be used to measure the ESMF process, mitigation plans and performance.

- a) Have the Environment and Social consultants trained local social and environmental specialists?
- b) Have the ESMP's and Final Designs been cleared by South Sudan's Ministry of Environment and Forestry?
- c) Do the Civil Works Contractors have the legal muscle to enforce the ESMP?

- d) At what rate are the civil works been monitored by MoED and by the MoEF?
- e) How many violations of the contractors have been recorded and at what rate are they occurring?
- f) How many recorded grievance cases have been settled within one year?

11 PROJECT IMPLEMENTATION ARRANGEMENTS, RESPONSIBILITIES AND CAPACITY BUILDING

The effective implementation of this ESMF will require adept technical capacity in the human resource base of implementing institutions (MoED SSEC and MoFP) as well as logistical facilitation and the necessary institutional linkages with other Government agencies and administrations of state/local governments who have a role in the management of E&S risks and impacts.

Whereas it was highlighted during the stakeholder consultations that the MoED faces considerable constraints in its ability to implement the project, it is important that the agency assigns personnel that possess the requisite understanding of all the inherent E&S issues and values on the project including; evaluation of E&S aspects on the project, screening, impact/risk identification, and mitigation and monitoring.

11.1 Roles and responsibilities for the implementation of the ESMF

This section considers the institutional arrangements that are required to implement the E&S actions on the project. The estimated cost of implementing these actions is highlighted in section 11.4 under the ESMF budget. Actual costs of implementing the actions will be determined during the preparation of E&S management plans for each project component and specific activities/subprojects related to the components.

The MoED will recruit or assign key PIU staff prior to implementation of the project: For component 1: (i) senior distribution system engineer; (ii) power systems planning engineer; (iii) GIS expert. For component 2: (iv) senior power engineer; (v) power engineer; (vi) site coordinator. For component 3: (vii) solar engineer; (viii) site coordinator; for component 4: (ix) energy policy specialist; (x) energy economist. Technical consulting firms will be hired to support the PIU to implement the project and strengthen the capacity of the MoED as well as SSEC. The PIU will be responsible for coordinating with the World Bank and reporting on a quarterly and annual basis on project progress, as well as on implementation challenges. The PIU will ensure that lack of adequate progress is promptly and adequately addressed and brought to the attention of the relevant decision makers and executive powers. It will also ensure coordination with the MoH, MoGEI, CRA, UNHCR and the relevant stakeholders. A summary of some of the roles and responsibilities that will be undertaken in the implementation of the ESMF, are highlighted below (Table 11.1)

Overall, the World Bank will undertake project implementation support and supervision missions to ensure effective environmental and social safeguards management on the project.

Table 0.1: Roles and responsibilities for implementation of the ESMF

| S/No. | Activity/ Task | Responsibility |
|-------|---|--|
| | Implementing agency for all components of the project Submission of quarterly reports to monitor and evaluate the project progress | MoED |
| | Day to day coordination and monitoring of implementation of all project components and cross-cutting activities | PIU |
| | Support project implementation. | MoED staff, Seconded from the relevant entities including SECC, JEDCO, MoH, MoGEI, TPMA, and other relevant entities |

| S/No. | Activity/ Task | Responsibility |
|-------|--|--|
| | Strategic guidance and overall oversight during project implementation and ensuring effective coordination among all the stakeholders | Project Steering Committee (PSC ²²) |
| | Preparation of E&S brief assessments for subprojects | MoED, WB, PIU |
| | Screening of E&S Risks and Impacts on subprojects | MoED, Consultants |
| | Preparation of Terms of Reference | MoED, WB, PIU, MoFP |
| | Approval of Terms of Reference | MoFP, WB |
| | ESIA Studies | Consultants hired by MoED and the WB |
| | Review of ESIA Report (s) | MoED, PIU, WB |
| | Approval of ESIA's and issuance of ESIA completion certificates | MoED, WB (In coordination with the MoEF) |
| | Implementation of the ESMF | MoED/PIU |
| | Review and update of sub-project ESMPs before commencement of civil works for the respective project components | Contractors |
| | Implementation of the ESMPs including related management plans such as the Stakeholder Engagement Plan, Security Management Plan, Labour Management Plan, etc. | Contractors and E&S consultants hired by MoED |
| | Supervision of project implementation through field activities | MoED, PIU, WB |
| | Monitoring of E&S safeguards implementation | Consultants hired by MoED, PIU, UNHCR, MoH, UNICEF, WB, MoGEI Participating state/local government administrations, SSEC |

11.2 Identification of capacity building needs

The MoED and SSEC will have responsibilities for steering the project and its implementation. However, the entities have limited technical capacity to conduct regular operations due to high staff turnover resulting from the lack of financial resources to adequately compensate technical and engineering professionals especially under components 1 and 2. It is important to know that under component 4, a range of capacity building activities, including recruitment of international consultants will be supported by the Project.

The following capacity building needs have been identified at this stage.

- Strengthening the adequacy of existing systems and opportunities (*This consists of aspects such as: external enabling environment; organisational policy, procedures, structures and culture; human resources; budgets, equipment and means*);

²² The PSC will be chaired by the MoED Minister and include management representatives from MoFP and SSEC as the core members. The PSC will also include observer organization, including but not limited to, JEDCO, Ministry of Health, City Government of Juba, Yei County Government, UNICEF, UNHCR, Commission for Refugee Affairs (CAR), Government of Japan (as the PHRD donor), the World Bank, and other relevant stakeholder as needed.

- Human Resource Capacities for E&S Risks Management. *(This consists of aspects such as: appropriate credentials, trainings and experience to carry out tasks; existence of workplans, terms of reference for key positions; sufficient budgets to support E&S tasks; existence of human resource policies to efficiently recruit and retain staff, staff understanding their roles and having adequate resources to complete tasks);*
- Strengthening linkages between institutions that have E&S roles on the project *(This consists of aspects such as institutional arrangements and linkages that the MoED has with other Government institutions that have a role in the management of project-related E&S risks and impacts);*
- Establishment of systems for E&S risks and impact management *(This consists of aspects such as: environment and social assessment processes; environmental and social impacts mitigation planning; implementation of environmental and social management measures; land acquisition and resettlement planning (preparation of resettlement policy framework [RPF] and/or resettlement Action plan [RAP]); land acquisition and resettlement implementation (including financing); and stakeholder engagement planning and implementation); and*
- Capacity development needs with respect to implementation of the World Bank ESF.

11.3 Training program and tentative timelines

11.3.1 Personnel from MoED, SSEC and other Government of South Sudan agencies

It is recommended that prior to project commencement, a 2–3-day workshop is held in Juba targeting MoED, SSEC and other Government agencies that are closely associated with the project. The Workshop (whose outline is as detailed in Table 11.2), aims at providing attendees with basic skills for implementing the guidelines provided in the ESMF combined with the use of appropriate tools, such as the screening form, ESMP template and the ESMF annual reporting form. Refresher trainings should be held as need arises during the course of the project.

Table 0.2: Proposed Training format for ESMF implementation

| Module | Duration/days |
|--|---------------|
| Day 1 Introduction <ul style="list-style-type: none"> • Objectives of the ESMF • Key stakeholders with a role in the ESMF • Relevant legislative and regulatory requirements and the World Bank ESF • Baseline Environmental and Social Conditions • Structure and roles of Project Implementation units and relevant government authorities | 1 |
| Day 2 Summary of guidelines <ol style="list-style-type: none"> 1. Environmental and Social Screening and Impact Assessment 2. Stakeholder Consultations and Engagement 3. Land acquisition and resettlement, and GBV/SEA/SH. 4. Environmental and Social Impacts and Mitigation Measures 5. Monitoring and Reporting 6. Grievance Redress Mechanism 7. ESMP & ESMS | 1 |

| Module | Duration/days |
|---|---------------|
| Day 3 Capacity building and project implementation budgets <ul style="list-style-type: none"> • Capacity Building and Implementation Budgets • Capacity building requirements • Budgeting for the implementation of ESMPs, ESMS, RAPs and other safeguard management plans • Q&A session | 1 |
| Total | 3 days |

11.3.2 Training of contractors, , supervising consultants

The training will also cover some of the safeguard areas of specific interest, including but not limited to: Development & Implementation of Contractor's ESMP, Health and Safety Management systems (both Occupational and Community Safety), management and use of Auxiliary Facilities (Equipment Storage Yard), environmental and social due diligence, Labour influx management and use of Code of Conduct, Child abuse/defilement, Grievance Redress Management, Incident notification and reporting under the Project, among others.

A proposed format for a 2-day training is provided in table 11.3 below

Table 0.3: Awareness Raising and Training for Contractors, and Supervision Consultants

| Module | Duration/days |
|---|---------------|
| Day 1 Awareness raising <ul style="list-style-type: none"> • Environmental & Social awareness and the importance of effective mitigation • Sound Practice for Environmental and Social mitigation measures • Compliance with WB ESF and local legislation on OHS, ESIA and ESMP requirements • Stakeholder engagements • SEA, GBV and VAC • Contract management requirements | 0.5 |
| Day 2 Summary of guidelines <ul style="list-style-type: none"> • Development/Implementation & scope of Contractors' ESMPs • Environmental, Health & Safety Management onsite • Acquisition & management of auxiliary facilities and construction materials sites • Labour influx management and child and forced labor • Grievance Redress Mechanism, Process and Committees • Implementation of the ESMP (contract clauses) | 1.5 |

| | |
|---|---------------|
| <ul style="list-style-type: none"> • Monitoring and Reporting of ESMPs (and RAPs) • Climate change • Biodiversity | |
| Total | 2 days |

11.3.3 Training of safeguards implementation staff

During the Implementation of the project and as part of capacity building for support towards the Implementation of this ESMF and its associated tools, safeguard specialist(s) will undergo the following trainings: -

- Occupational Health and Safety Management System ISO 45001:2018 (Lead implementers and Auditors)
- Environmental Management System ISO 14005:2019 (Lead Implementers and Auditors).
- Quality Management System 9001 (Lead Implementer and Auditors).
- Labour Management practices by ILO.
- Professional Occupational Health and Safety Trainings
- Land acquisition and management related courses
- SEA, GBV and VAC training
- Stakeholder engagement related training.
- Attend international conferences on climate change, biodiversity, impact assessments to share and learn best practices for replication on the project.

Table 0.4: Tentative schedule for continuous training during construction and operation

| No. | Training Topics | Description | Schedule | |
|-----|--|---|--|--------------------------------|
| | | | Construction Phase | Operation Phase |
| 1 | Introduction to project components | This topic will introduce about the background of the proposed project & major components of the South Sudan Energy Sector Access and Institutional Strengthening Project. | Once at the early stage of project implementation (for 1 day) | |
| 2 | Introduction to Environmental & Social Management & monitoring Plans | This session will introduce participants about ESMF, principles, application & rational for preparation of ESMF -describes the range of E&S issues associated with the projects & corresponding management strategies to be employed to mitigate potential adverse impacts | Once at the early stage of project implementation (for two days) | |
| 3 | National Environmental Laws and Legislation & International | This section will discuss & introduce application of relevant national policies, legal & institutional frameworks, guidelines as well as | Twice a year (for 2 days) | Once the early operation phase |

| No. | Training Topics | Description | Schedule | |
|-----|--|---|--|----------------------|
| | | | Construction Phase | Operation Phase |
| | Financial Institutions Safeguard Policies and standards. | international policies, environmental & social standards. | | (for Two days) |
| 4 | Screening | Introduction to ESIA process · Application of the screening checklist · Project screening methods & application of the screening checklist | Once the early stage of construction phase (1 day) | |
| 5 | E &S impacts & mitigation measures | This topic will key potentially beneficial impacts & adverse impacts associated with development projects including the proposed Project Mitigation & benefit enhancement measures: e.g., battery and solar panel handling and disposal, STD and other transmitted disease, GBV/SH, Project GRM, Occupational Health and Safety Issues etc. | Once a year (2 days) | Once a year (2 days) |
| 6 | Public consultation | This topic will introduce the need for stakeholder engagement for public consultation and the objectives and approaches of public consultation | Once a year (1 day) | Once a year (1 day) |

11.4 ESMF Budget

This section presents the budget estimates for implementation of the Environmental and Social Management Framework (ESMF). However, detailed budgets for the project components and related specific works/sub-components will be developed at a later stage for components 1, 2 and 3.

Table 11.4 below shows a budget breakdown of the cost for implementing the ESMF.

Table 0.5: Budget Estimate for implementing the ESMF

| E&S Management Aspect | Implementation stage | Timing and frequency | Cost Estimate (US \$) |
|---|---|--|-----------------------|
| <u>Based on estimated number of ESIA studies, Undertaking subprojects Environmental and Social Impact Assessment studies</u> | Prior to project implementation | Once | 100,000 |
| <u>Based on estimated number of ESMPs studies, Preparation of subproject ESMPs</u> | | Once | 50,000 |
| Environmental and Social Audits | During the construction phase and every year during the operation and | Once during the construction phase and every | 50,000 |

| E&S Management Aspect | Implementation stage | Timing and frequency | Cost Estimate (US \$) |
|---|---|--|-----------------------|
| | maintenance (O&M) phase especially for solar power stations | year during the O&M phase | |
| Third party monitoring-Multisectoral monitoring committee meetings and management tours | During project implementation | Quarterly | 200,000 |
| COVID-19 testing and implementation of prevention measures (<i>Procurement of materials and undertaking awareness</i>) | During project implementation | Quarterly | 20,000 |
| Training and capacity building focusing on: <ul style="list-style-type: none"> • Labour management procedures; • Training for E&S safeguards personnel; • Training of project implementing partners, contractors and refugee hosting communities. | Throughout the project implementation stage | To be conducted once, during early stages of project activities. | 150,000 |
| Procurement of equipment and retooling | During project implementation | Throughout the project cycle | 300,000 |
| Undertaking a Strategic Environmental Assessment for the Energy Sector Master Plan as highlighted under component 4 of the Project | Prior to project implementation | Once | 100,000 |
| Designing and building a temporary hazardous waste storage facility | | | 100,000 |
| Contingency costs | | | 50,000 |
| Grand Total | | | 950,000 |

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ANNEXES

ANNEX I: ENVIRONMENTAL AND SOCIAL SCREENING FORM

This form is to be used to ascertain the environmental and social risk rating of the project components or subprojects, determine the relevance of World Bank environmental and social Standards (ESS) to the project, and the instruments to be prepared.

| | | | |
|---|--|----------------------------------|--|
| Project Name: | | District/City: | |
| Project Location: | | Nature/Size: | |
| Type of activity: (e.g., New Construction, Expansion, Installation, Periodic maintenance): | | | |
| Name & Signature of Evaluator: | | Date of Field Evaluation: | |

| | | Appraisal | Risk / Significance rating | | | | | |
|-------------|---|-----------|----------------------------|-----|----------|-------------|------|---------|
| | | Yes/No | None | Low | Moderate | Substantial | High | unknown |
| 1 | Environmental Screening (ESS3 and ESS6) | | | | | | | |
| | Will the project generate the following impacts? | | | | | | | |
| 1.1 | Loss of trees | | | | | | | |
| 1.2 | Soil erosion/siltation in the area | | | | | | | |
| 1.3 | Pollution to land by diesel, oils etc. | | | | | | | |
| 1.4 | Dust emissions | | | | | | | |
| 1.5 | Solid and liquid wastes | | | | | | | |
| 1.5 | Borrow pits and pools of stagnant water | | | | | | | |
| 1.6 | Rubble/heaps of excavated soils | | | | | | | |
| 1.7 | Emergence of wildfire | | | | | | | |
| 1.8 | Invasive tree species | | | | | | | |
| 1.9 | Long term depletion of water | | | | | | | |
| 1.10 | Exposure to hazardous chemicals including PCBs | | | | | | | |
| 1.11 | Nuisance from noise or smell | | | | | | | |
| 1.12 | Loss of soil fertility | | | | | | | |
| 1.13 | Generation of hazardous waste including solar batteries | | | | | | | |

| | | Appraisal | Risk / Significance rating | | | | | |
|-------------|---|-----------|----------------------------|-----|----------|-------------|------|---------|
| | | Yes/No | None | Low | Moderate | Substantial | High | unknown |
| 1.14 | Cross through, located within or nearby environmentally sensitive areas (e.g., national parks, intact natural forests, wetlands, etc.)? | | | | | | | |
| 1.15 | Cause poor water drainage and increase the risk of water-related diseases such as malaria or bilharzias? | | | | | | | |
| 1.16 | Risk of exposing the workers to extremely hazardous working conditions. | | | | | | | |
| 2 | Social Screening (ESS5) | | | | | | | |
| | Will the project generate the following negative social and economic impacts? | | | | | | | |
| 2.1 | Loss of land by households | | | | | | | |
| 2.2 | Loss of properties –houses, structures | | | | | | | |
| 2.3 | Loss of perennial trees, fruit trees by households | | | | | | | |
| 2.4. | Loss of crops by people | | | | | | | |

| | | Appraisal | Significance | | | | | |
|------------|--|-----------|--------------|-----|----------|-------------|------|---------|
| 3 | ESS2, ESS4, ESS5, ESS7, ESS8 | Yes/No | None | Low | Moderate | Substantial | High | unknown |
| 3.1 | Loss of access to river/forests/grazing area | | | | | | | |
| 3.2 | Impact heritage site, graveyard land | | | | | | | |
| 3.3 | Conflicts over use of local water resources | | | | | | | |
| 3.4 | Disruption of important pathways, footpath/roads | | | | | | | |
| 3.5 | Loss of communal facilities – churches | | | | | | | |

| | | | | | | | | |
|-----|---|--|--|--|--|--|--|--|
| 3.6 | Loss of livelihood system | | | | | | | |
| 3.7 | Risk of encouraging child labor | | | | | | | |
| 3.8 | Risk of workers to extreme exposure for GBV | | | | | | | |
| 3.9 | Spread of HIV/AIDS and other STI's | | | | | | | |
| | Risk of GBV/SEA/SH to the affected communities | | | | | | | |
| | Risk associated with Security personnel | | | | | | | |
| | Impacts on Historically underserved groups/Ethnic minorities | | | | | | | |

Categorisation & Recommendations:

After compiling the above, determine which risk category the sub-project falls under based on the environmental risk categories: High, Substantial, Moderate and Low risk. If the sub-project falls under "Substantial, Moderate or low" risk categories, proceed to identify the category of the sub-project based on the National EIA guidelines issued by the respective Countries.

a) World Bank ESF Categorisation

| Place Tick in applicable box | Category | Details |
|------------------------------|-------------------------|--|
| | High Risk | Sub-project of the South Sudan Energy Sector Access and Institutional Strengthening Project likely to fall under "High Risk" rating. In the likely event that subproject falls under "High Risk" the Environmental and social Assessment should be conducted in accordance with the World Bank Environmental and Social Standards (ESSs) by preparing an ESIA study report. |
| | Substantial Risk | Sub-project of the South Sudan Energy Sector Access and Institutional Strengthening Project likely to fall under "Substantial Risk" rating. In the likely event that subproject falls under "Substantial Risk" the Environmental and Social Assessment of the subproject should be conducted in accordance with any requirements of the ESSs that the Bank deems relevant to such subprojects by preparing an ESIA study report. |
| | Moderate Risk | Environmental and Social Assessment of the subproject should be conducted in accordance with any requirements of the ESSs that the Bank deems relevant to such subprojects by preparing an ESMP. |
| | Low Risk | Sub-project is not subject to environmental assessment as no potential impacts are anticipated. |

ANNEX II: GUIDANCE FOR SUBPROJECT RISK CATEGORIZATION

Pursuant to the Environmental and Social Policy, subprojects are classified as *High Risk*, *Substantial Risk*, *Moderate Risk* or *Low Risk* taking into account relevant potential risks and impacts.

- A Project is classified as High Risk after considering, in an integrated manner, the risks and impacts of the Project, taking into account the following, as applicable.
 - i. The Project is likely to generate a wide range of significant adverse risks and impacts on human populations or the environment. This could be because of the complex nature of the Project, the scale (large to very large) or the sensitivity of the location(s) of the Project. This would take into account whether the potential risks and impacts associated with the Project have the majority or all of the following characteristics:
 - i. Long term, permanent and/or irreversible (e.g., loss of major natural habitat or conversion of wetland), and impossible to avoid entirely due to the nature of the Project;
 - ii. High in magnitude and/or in spatial extent (the geographical area or size of the population likely to be affected is large to very large);
 - iii. Significant adverse cumulative impacts;
 - iv. Significant adverse transboundary impacts; and
 - v. A high probability of serious adverse effects to human health and/or the environment (e.g., due to accidents, toxic waste disposal, etc.).
 - ii. The area likely to be affected is of high value and sensitivity, for example sensitive and valuable ecosystems and habitats (legally protected and internationally recognized areas of high biodiversity value), lands or rights of Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities and other vulnerable minorities, intensive or complex involuntary resettlement or land acquisition, impacts on cultural heritage or densely populated urban areas.
 - iii. Some of the significant adverse Environmental and Social risk and impacts of the Project cannot be mitigated or specific mitigation measures require complex and/or unproven mitigation, compensatory measures or technology, or sophisticated social analysis and implementation.
 - iv. There are significant concerns that the adverse social impacts of the Project, and the associated mitigation measures, may give rise to significant social conflict or harm or significant risks to human security.
 - v. There is a history of unrest in the area of the Project or the sector, and there may be significant concerns regarding the activities of security forces.
 - vi. The Project is being developed in a legal or regulatory environment where there is significant uncertainty or conflict as to jurisdiction of competing agencies, or where the legislation or regulations do not adequately address the risks and impacts of complex projects, or changes to applicable legislation are being made, or enforcement is weak.
 - vii. The past experience of the implementing agencies in developing complex Projects is limited; their track record regarding ES issues would present significant challenges or concerns given the nature of the Project's potential risks and impacts.
 - viii. There are significant concerns related to the capacity and commitment for, and track record of relevant Project parties, in relation to stakeholder engagement.
 - ix. There are a number of factors outside the control of the Project that could have a significant impact on the ES performance and outcomes of the Project.

- A Project is classified as Substantial Risk after considering, in an integrated manner, the risks and impacts of the Project, taking into account the following, as applicable:
 - The Project may not be as complex as *High-Risk* Projects, its Environment and Social scale and impact may be smaller (large to medium) and the location may not be in such a highly sensitive area, and some risks and impacts may be significant. This would take into account whether the potential risks and impacts have the majority or all of the following characteristics:
 - i. They are mostly temporary, predictable and/or reversible, and the nature of the Project does not preclude the possibility of avoiding or reversing them (although substantial investment and time may be required);
 - ii. There are concerns that the adverse social impacts of the Project, and the associated mitigation measures, may give rise to a limited degree of social conflict, harm or risks to human security;
 - iii. They are medium in magnitude and/or in spatial extent (the geographical area and size of the population likely to be affected are medium to large);
 - iv. The potential for cumulative and/or transboundary impacts may exist, but they are less severe and more readily avoided or mitigated than for *High-Risk* Projects; and
 - v. There is medium to low probability of serious adverse effects to human health and/or the environment (e.g., due to accidents, toxic waste disposal, etc.), and there are known and reliable mechanisms available to prevent or minimise such incidents.
 - The effects of the Project on areas of high value or sensitivity are expected to be lower than *High-Risk* Projects.
 - Mitigatory and/or compensatory measures may be designed more readily and be more reliable than those of *High-Risk* Projects.
 - The Project is being developed in a legal or regulatory environment where there is uncertainty or conflict as to jurisdiction of competing agencies, or where the legislation or regulations do not adequately address the risks and impacts of complex Projects, or changes to applicable legislation are being made, or enforcement is weak.
 - The past experience of the implementing agencies in developing complex Projects is limited in some respects, and their track record regarding Environmental and Social issues suggests some concerns which can be readily addressed through implementation support.
 - There are some concerns over capacity and experience in managing stakeholder engagement but these could be readily addressed through implementation support.
- A project is classified as Moderate Risk after considering, in an integrated manner, the risks and impacts of the Project, taking into account the following, as applicable:
 - The potential adverse risks and impacts on human populations and/or the environment are not likely to be significant. This is because the Project is not complex and/or large, does not involve activities that have a high potential for harming people or the environment, and is located away from environmentally or socially sensitive areas. As such, the potential risks and impacts and issues are likely to have the following characteristics:
 - Predictable and expected to be temporary and/or reversible;
 - Low in magnitude;
 - Site-specific, without likelihood of impacts beyond the actual footprint of the Project; and
 - Low probability of serious adverse effects to human health and/or the environment (e.g., do not involve use or disposal of toxic materials, routine safety precautions are expected to be sufficient to prevent accidents, etc.).

- The Project's risks and impacts can be easily mitigated in a predictable manner.

A project is classified as Low Risk if it's potential adverse risks to and impacts on human populations and/or the environment are likely to be minimal or negligible. These Projects, with few or no adverse risks and impacts and issues, do not require further Environmental and Social assessment following the initial screening.

ANNEX III: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) TEMPLATE

Note: The template provided in this section is not meant to be this project's ESMP but a template to indicate a general structure of details that should be captured in a subproject's ESMP, when necessary.

| Key Activities | Potential E&S Issues and Risks | Proposed Mitigation Measures | Responsibilities | Timeline | Budget |
|---|-----------------------------------|---------------------------------|------------------|----------|--------|
| Environmental and Social Risks and Mitigation Measures during the Construction Stage | | | | | |
| | | | | | |
| Environmental and Social Risks and Mitigation Measures during the Operational Stage | | | | | |
| | | | | | |
| | | | | | |
| Environmental and Social Risks and Mitigation Measures during Decommissioning | | | | | |
| | | | | | |

ANNEX IV: GRIEVANCE FORM

| SOUTH SUDAN ENERGY SECTOR ACCESS AND INSTITUTIONAL STRENGTHENING PROJECT | | | |
|---|---------------------------------|---|---------------------------------|
| GRIEVANCE FORM | | | |
| COMPLAINANT DETAILS | | | |
| Reference Number | Date Received | How was the Grievance Submitted | Received by: |
| | | | |
| Name of Complainant | Address | Telephone Number | Email |
| | | | |
| DETAILS OF GRIEVANCE | | | |
| Person Responsible for Addressing Grievance | Description of Grievance | | |
| | | | |
| Grievance Priority (Critical, Medium, Low) | Evidence of the Issue | | |
| | | | |
| ACTION TAKEN / REQUIRED | | | |
| Acknowledgement sent to Complainant (YES / NO) | Date of Acknowledgement | Date Set for Resolution of Grievance | |
| | | | |
| Description of Action Taken | | | |
| | | | |
| Person Responsible for Implementing Action | | Date of Completion | |
| | | | |
| COMMUNICATION OF ACTION | | | |
| Method and Date of Feedback to Complainant | | Complainant Response to Action | |
| | | | |
| EFFECTIVENESS REVIEW | | | |
| Were Actions Effective in Resolving the Grievance (ACCEPTED/REJECTED) | Grievance Closed (Y/N) | Date | Signature of Complainant |
| | | | |
| Approved By | Date | | |
| | | | |

ANNEX V: GRIEVANCE LOG TEMPLATE

[illegible]

ANNEX VI: LETTER OF ACKNOWLEDGEMENT

Insert complainant's address

Insert DDMMYY

Insert Contractor's/Agencies' address

Insert DDMMYY

RE: GRIEVANCE/COMPLAINT ACKNOWLEDGEMENT

Dear *(insert complainant's full names)*

I am writing to inform you that we have received your grievance/complaint about *(insert outline of grievance/complaint)*.

We are currently investigating the circumstances surrounding the problem and you will hear from us again no later than *insert DDMMYY*

Thank you for informing us about your concern, and for your patience while we explore this matter.

If you have any questions concerning this letter or would like to discuss the complaint further, please contact us *insert the contact details*.

Yours sincerely

Insert staff name

Insert position

ANNEX VII: ENVIRONMENTAL, EHS CLAUSES FOR CONSTRUCTION CONTRACTORS

General EHS Considerations (*Specific EHS clauses will be drafted at the implementation stage and be tailored to the activities being undertaken*)

- Contractors shall comply with any specific Environmental and Social Management Plans for the works/activities that they will be undertaking. The contractors shall inform themselves about such ESMPs and prepare their work strategy and plan to fully take into account relevant provisions of the ESMPs.
- Importantly, Contractors will be required to develop their own ESMPs for the activities that they will be undertaking. The developed ESMPs should be aligned with the ESMF/ESMP requirements and be compliant with the World Bank ESF. No work will /should be undertaken by a contractor before they receive PIU approval for the ESMPs that they have developed.
- Should the contractors fail to implement the approved ESMPs after written instruction by the supervising personnel on the project, the MoED/PIU reserves the right to sanction any disciplinary measures on the contractors.
- Notwithstanding the obligation of the contractors as stated above, the contractors shall implement all measures necessary to avoid undesirable adverse environmental and social impacts wherever possible, restore work sites to acceptable standards and abide by any environmental performance requirements specified in an ESMP.
- *Contractor shall prepared Gender based violence and sexual exploitation and abuse (GBV/SEA) prevention and response action plan.*

The ES measures to be considered by contractors include, but are not limited to;

- Minimising the effect of dust on the surrounding environment resulting from earth mixing sites, vibrating equipment, vehicles transporting project materials etc. to ensure safety, health and the protection of workers and communities living in the vicinity of dust producing activities;
- Ensure that noise levels emanating from machinery, vehicles and noisy civil works/construction activities are kept at a minimum for the safety, health and protection of workers within the vicinity of high noise levels and nearby communities;
- Ensure that existing water flow regimes in rivers, streams and other natural or irrigation channels is maintained and/or re-established where they are disrupted due to works being carried out;
- Prevent bitumen, oils, lubricants and waste water used or produced during the execution of works from entering into rivers, streams, irrigation channels and other natural water bodies/reservoirs, and also ensure that stagnant water in uncovered borrow pits is treated in the best way to avoid creating possible breeding grounds for mosquitoes;
- Prevent and minimise the impacts of quarrying, earth borrowing, piling and building of temporary construction camps on the biophysical environment including protected areas and arable lands; local communities and their settlements. In as much as possible restore/rehabilitate all sites to acceptable standards;
- intolerant of, and enforce disciplinary measures for GBV, inhumane treatment, sexual activity with children, and sexual harassment

- Upon discovery of ancient heritage, relics or anything that might or is believed to be of archeological or historical importance during the execution of works, the Chance Find Procedures²³ should be followed;
- Discourage construction workers from engaging in the exploitation of natural resources such as hunting, fishing, and collection of forest products or any other activity that might have a negative impact on the social and economic welfare of the local communities within the project areas;
- Implement soil erosion control measures in order to prevent surface run off that could lead to siltation in waterbodies, wetlands etc.;
- Construction workers camps should be provided with garbage skip, sanitation and drinking water facilities;
- As much as possible/practicable, materials for civil works should be locally sourced to avoid importation of foreign materials which would entail long distance transportation; and
- Ensure public safety, and meet set traffic safety requirements for the operation of work activities to prevent/avoid accidents;

Material excavation and deposit

- Where applicable, contractors shall obtain appropriate licenses/permits from relevant authorities to operate quarries or borrow areas.

Health and safety

- Prior to the commencement of construction works, contractors should undertake health awareness and hygiene campaigns. These campaigns should include messages on HIV/AIDS, COVID-19 etc.;
- Adequate and appropriate signage should be installed to warn pedestrians and motorists about existing hazards;
- Construction vehicles shall not exceed the maximum set speed limit;

Rehabilitation and prevention of soil erosion

- To the extent practicable, contractors shall rehabilitate scarred sites
- To the extent practicable, natural drainage patterns that have been damaged by works, should be reinstated where they have been altered or impaired.

Water Resources management

- Contractor shall at all costs avoid conflicting with water demands of local communities.
- Abstraction of both surface and underground water shall only be done with the consultation of the local community and after obtaining a permit from the relevant Water Authority.
- Abstraction of water from wetlands shall be avoided. Where necessary, authority has to be obtained from relevant authorities.

²³ A Chance Finds Procedures is attached to this document in Annexure IX

- Temporary damming of streams and rivers shall be done in such a way that avoids disrupting water supplies to communities downstream, and maintains the ecological balance of the river system.
- No construction water containing spoils or site effluent, especially cement and oil, shall be allowed to flow into natural water drainage courses.
- Wash water from washing out of equipment shall not be discharged into water courses
- Site spoils and temporary stockpiles shall be located away from the drainage system, and
- surface run off shall be directed away from stockpiles to prevent erosion.

Repair of Private Property

- Where the contractors deliberately or accidentally damage private property, they shall (at their own cost) repair the property to the owner's satisfaction.
- Where compensation for inconveniences, damage of crops etc. are claimed by the owner, the MoED has to be informed by the Contractor.

ANNEX VIII: TEMPLATE FOR QUARTERLY AND ANNUAL ES PERFORMANCE REPORTS

| Company/Contractor Details (Name, Address, location) | | |
|---|--------|---|
| | | |
| Report Period: | | |
| General Aspects | | |
| Is the project materially compliant with all applicable environmental and social laws and regulations? | Yes/No | If no, please provide details of any material non-compliance: |
| Have there been any accidents or incidents that have caused damage to the environment, brought about injuries or fatalities, affected project labour or local communities, affected cultural property, or created liabilities for the company? | Yes/No | If yes, please describe, including details of actions to repair and prevent reoccurrence: |
| Have there been any changes to environment, social, labour or health and safety laws or regulations that have materially affected the company? | Yes/No | If yes, please describe: |
| How many inspections did you receive from the environmental authorities during the reporting period? | Yes/No | Please provide details of these visits, including number and nature of any violations found |

| | | |
|--|--------|--|
| How many inspections did you receive from the health and safety authorities during the reporting period? | Yes/No | Please provide details of these visits, including number and nature of any violations found |
| How many inspections did you receive from the labour authorities during the reporting period? | Yes/No | Please provide details of these visits, including number and nature of any violations found |
| Have these visits resulted in any penalties, fines and/or corrective action plans? | Yes/No | If yes, please describe, including status of implementing corrective actions to address any violations found |
| Has the Company engaged any contractors for project-related work in the reporting period? | Yes/No | If yes, please state for which types of work, and how the company has monitored the compliance of contractors with the Environmental and Social Action Plan: |
| Were any of the violations stated above the responsibility of contractors? | Yes/No | If yes, please provide details, including how the Company is ensuring that corrective actions are implemented by the Contractor? |
| Have any operations been reduced, temporarily suspended or closed down due to environmental, health, safety or labour reasons? | Yes/No | If yes, please describe: |
| Please describe any environment or social programmes, initiatives or sub-projects undertaking during the reporting period to improve the company's environmental or social performance and/or management systems: | | |

Please indicate the level of associated expenditure (capital expenditure and operating expenditure), and whether this relates to the requirements of the Environmental and Social Action Plan, or to any other initiative:

Environmental Monitoring Data

Provide details of the types and amounts of solid wastes generated by the project. Indicate where wastes are classified as hazardous. Indicate the final re-use, recycle or disposal method for each waste type.

Provide details of the types and amounts of waste water generated by the project. Indicate the final re-use, recycle or disposal method for the waste water.

Other measurements for which measurements may be done include: Air emissions and Noise, environmental liabilities, traffic, security and biodiversity, resource efficiency.

Resource usage and Product Output

Provide indications on the amounts of fuels used i.e., Oil, Gas, grid electricity etc.

Occupational Health and Safety Data

Provide leading and lagging statistics for direct and contracted employees.

Stakeholder engagement

Name/Contact of Project Community Engagement Manager:

Provide information on the implementation of the stakeholder engagement plan and summarise interaction with stakeholders during the reporting period, including:

- a) Meeting or other initiatives to engage with members of the public or public organisations during the report period,*
- b) information provided to members of the public and other stakeholders during the report period relating to environmental, social or safety issues;*
- c) coverage in media;*
- d) and interaction with any environmental or other community groups.*

Describe any changes to the Stakeholder Engagement Plan:

Community interaction and Development

Summarize any social or community development initiatives undertaken by the company during the reporting period, and any associated expenditure:

Report verified and validated by company representative

Name:

Signature:

Date:

ANNEX IX: CHANCE FINDS PROCEDURE

• PURPOSE

The main objective of this procedure is to guide the PIU, contractors and sub-contractors on the management of cultural heritage properties should they be found as chance finds during the implementation of the project. The procedure set out here covers the reporting and management of such finds.

According to the Environmental and Social Standard (ESS) 8, cultural heritage refers to:

- a. Tangible cultural heritage, which includes movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Tangible cultural heritage may be located in urban or rural settings, and may be above or below land or under the water; and
- b. Intangible cultural heritage, which includes practices, representations, expressions, knowledge, skills - as well as the instruments, objects, artefacts and cultural spaces associated therewith – that communities and groups recognize as part of their cultural heritage, as transmitted from generation to generation and constantly recreated by them in response to their environment, their interaction with nature and their history.

The objectives of Environmental and Social Standard 8 are;

- a. To protect cultural heritage from the adverse impacts of project activities and support its preservation;
- b. To address cultural heritage as an integral aspect of sustainable development;
- c. To promote meaningful consultation with stakeholders regarding cultural heritage; and
- d. To promote the equitable sharing of benefits from the use of cultural heritage.

The purpose of this procedure is, therefore, to provide clear guidelines to be followed in the event of a chance find due to the project construction activities.

• SCOPE

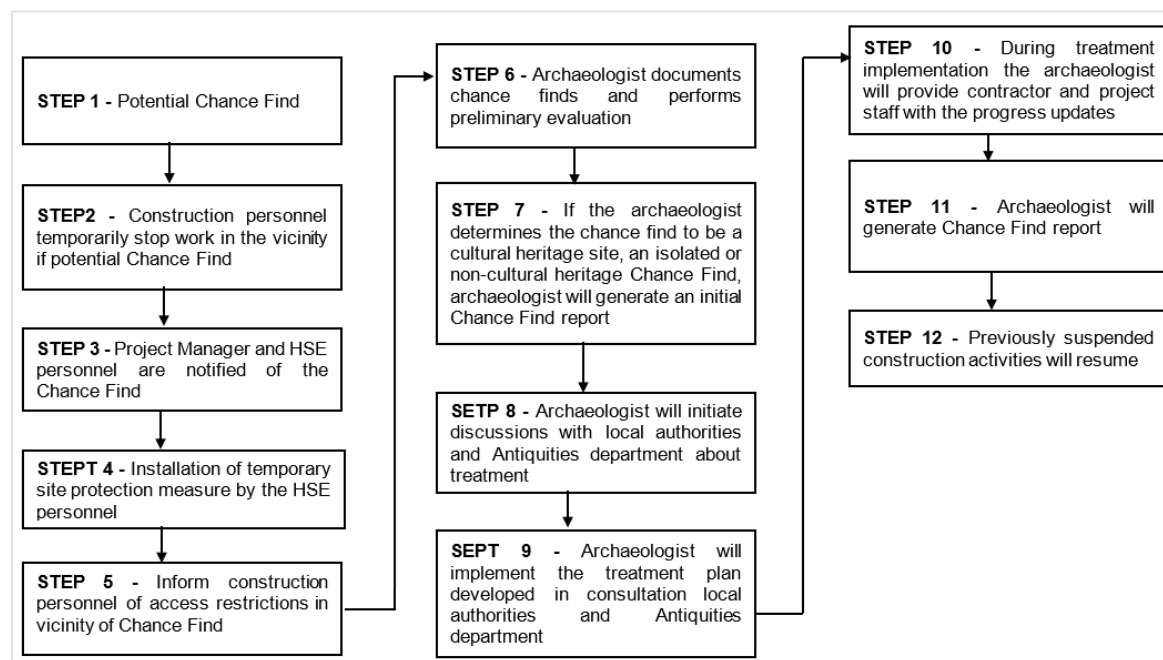
The Chance Finds Procedure covers the systematic steps to be followed in the event that an element which may reasonably be considered to be of cultural heritage importance is encountered during the life of operations in the project.

In the context of this chance find procedure, the term “*element of cultural heritage*” includes burial grounds, archaeological, paleontological, ethnographical, and historical and/or items/sites of traditional interest. The chance finds procedure covers the actions to be taken from the discovery of a heritage site or item to its investigation and assessment by a trained archaeologist or another appropriately qualified person.

- Environmental and Social Standard 8: Cultural Heritage

This is the principal international guideline for cultural heritage. The Environmental and Social Standard 8 recognises that cultural heritage provides continuity in tangible and intangible forms between the past, present and future. This Environmental and Social Standard sets out measures designed

to protect cultural heritage throughout the project life-cycle. The Environmental and Social Standard sets out the need for a CFP according to this provision, '...the Borrower will engage cultural heritage experts to assist in the identification, valuation assessment and protection of cultural heritage ...'



Schematic representation of the Chance Finds Procedure - CFP

CHANCE FINDS PROCEDURE

- It will be a requirement on the project, that teams contracted to undertake activities on Components 1, 2 and 3, should undergo inductions and trainings on cultural heritage.
- Personnel in the PIU that are identified as being at the forefront of project implementation, should undergo a training on cultural heritage to ensure that they can recognise a cultural heritage find and comply with this procedure. The training should be undertaken by a cultural heritage specialist.
- Project implementation personnel must be instructed on the need to watch out for potential cultural heritage elements that may be exposed/encountered in the course of their work.

- Project Personnel that find potential cultural items or sites, as defined under this procedure, are to report this find to the designated personnel (e.g., Project manager/HSE staff), who will in turn report the same to the PIU. If a chance find is encountered, the following steps will be followed:
- The heritage resource will be avoided and all activities in the immediate vicinity of the chance find will be suspended;
- The person who discovers the chance find should record the following information; position (GPS coordinates), and the digital image of the find;
- The PIU must be immediately notified of the chance find encountered;
- The HSE/designated personnel must ensure that the site is delineated and secured to prevent any damage or loss of removable objects and undertake any other measures as may be reasonable for its protection. These measures will include fencing off the area of finds or sites;
- The contractor must Inform the archaeologist of the chance find and facilitate the project archaeologist to assess whether or not the chance find is of cultural/archaeological significance;
- If the discovered element is of cultural/archaeological significance, the project archaeologist must then inform the PIU;
- The PIU must notify, ideally within 2 days, but not more than a maximum of 14 days, the Antiquities department and request expert verification. The project cultural heritage officer/archaeologist should also be notified as soon as reasonable by the contractor. Decisions on how to handle the finding shall be taken by the Antiquities department. This could include conservation, preservation, restoration and salvage/rescue;
- If the expert verification (Antiquities department) confirms that the discovery falls within the heritage resource description, he/she will report and recommend suitable measures for its preservation and protection of the item/site;
- The Antiquities department will be notified of any need for relocation work of sacred or cultural sites and will be invited for any planned ceremonies or rituals for entering sacred or cultural sites in order to conduct ethnographic investigations;
- In the case of discovered human remains the local authorities will have to be notified who may decide that the remains are taken for forensic investigation. The Antiquities department and the project archaeologist should also be notified so that they may assess whether or not the remains are of archaeological significance. If the remains are deemed not to be of significance for the responsible authorities or archaeological purposes, the local authorities should be notified for them to sanction the reburial of the remains at another location in line with the local customs. The community cultural leaders and community members who used to stay at that location would also be notified of the find. PIU will meet the relocation and reburial expenses, including any traditional ceremonies;
- Previously suspended project activities may resume only after authorisation is given by the responsible local authorities;

- The project archaeologist will then write, within 14 days, a chance find report according to the *template below*. Where the item(s)/site(s) are archaeological. The report will detail the:
 - Date and time of discovery;
 - Location of the discovery;
 - Description of the chance find including photographs; and
 - Actions that were taken in responding to the chance find.
- The PIU will review and approve the chance find report and distribute it to the relevant lead agencies and other key stakeholders. The report will be included in the project database.

CHANCE FINDS REPORT TEMPLATE

• INITIAL DETAILS

| | | | |
|---|---------------|---------------------------------|----|
| Location of find | Date of find: | Person who identified the find: | |
| | | | |
| GPS coordinates | Zone: | X: | Y: |
| | | | |
| Description of chance find | | | |
| | | | |
| Photo Taken: | | | |
| | | | |
| <i>Insert at least one photo of the chance find</i> | | | |
| Was work stopped near the find? | | | |
| Yes | | No | |

| | |
|--|----|
| Was an archaeologist contacted? | |
| Yes | No |
| If yes, state the name of the archaeologist | |
| | |
| Statement of Significance (scientific, spiritual, historic, aesthetic and emotive) | |
| | |
| Detailed Description of Find | |
| | |
| <i>(e.g., approximate size of the site (area, length, height), description of site and vegetation, description of artefacts and number amongst others)</i> | |
| <ul style="list-style-type: none"> IMPACT ASSESSMENT | |
| Is the site/artefact destroyed? | |
| Yes | No |
| Can further impacts on the chance find be avoided? | |
| Yes | No |
| Avoidance and mitigation measures discussed | |
| | |
| <i>Outline the different avoidance and mitigation measures discussed.</i> | |
| Impact to find (avoidance and mitigation outcome) | |
| | |

| | | |
|--|-------------------------------------|------------------|
| <i>Outline the course of action taken and the reason for choosing these measures.</i> | | |
| Date completed form lodged | A person who lodged the form | Signature |
| | | |
| Report form verified and validated by the project manager | | |
| Name: | Signature: | Date: |

ANNEX X: SPECIFIC MEASURES AND COMMITMENTS TO BE UNDERTAKEN DURING PROJECT IMPLEMENTATION

| Management commitment | Applicable to the following Environmental/Social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|--|---|--|---|-------------------------|
| Construction Phase | | | | |
| Install secondary containment measures (such as bunded and impermeable lined surfaces) in areas where fuels, oils, lubricants and construction materials such as cement are stored and loaded or unloaded, including fuelling points | Water resources Soils and geology | Contractor's Site Manager | Secondary containment measures installed at unloading and storage areas. | During construction |
| Line the onsite substation with sand to absorb any chemical spillages from equipment | Water resources Soils and geology | Contractor's Site Manager | Onsite substation lined with sand. | During construction |
| In case of oil leakages, spillages, sedimentation and siltation, halt construction activities, and recover the pollutant immediately | Water resources Soils and geology Socio-economic | Contractor Site Manager | Clearly defined spillage management procedure available. Training in spill management and records of training having taken place. Presence of spill clean-up kits on-site. A record of spills and how these were managed, if any included in the incidents register. | Throughout construction |
| Design a spill contingency plan | Water resources Soils and geology | Contractor's Environment Management System Officer | Spill contingency plan available | Prior to construction |

| Management commitment | Applicable to the following Environmental/Social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|--|---|--|---|---------------------------------|
| Train staff in the use of spill cleaning equipment | Water resources Soils and geology | Contractor's Environment Management System Officer | Readily available records of training having taken place | Prior to construction |
| Inspect project vehicles and equipment on a daily basis to ensure they are in good working condition | Water resources Soils and geology Socio-economic Air | Contractor's Health and Safety Officer | Readily available vehicle and equipment inspection records | Daily |
| Undertake routine preventive maintenance of motorised equipment, and service machinery and vehicles in accordance with the manufacturers 'specifications | Water resources Soils and geology Socio-economic Air | Contractor's Health and Safety Officer | Routine maintenance and servicing of motorized equipment schedule available. Readily available preventive maintenance and servicing records. | As per the maintenance schedule |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|---|---|--|---|-------------------------|
| Ensure that the local community 's water supply is not adversely affected | Ground water resources Socio-economic | Contractor's Community liaison Officer | Record of regular consultations with the local community and records of any complaints related to water supply from the local community | Throughout construction |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|---|---|--|---|-------------------------|
| Ensure that all wastes generated from construction activities are properly collected in a designated area and handled prior to disposal. Provide separate waste skips for collection of different categories of waste (biodegradable, non-biodegradable, hazardous and non-hazardous wastes)) | Socio-economic Water resources Soils and geology | Contractor's Site Manager | Clearly defined designated area for the collection of waste (waste shade) Properly labelled waste skips for collection of different categories of waste Evidence of contracted licensed waste handler available on site. Waste slips indicating the management of hazardous wastes | Throughout construction |
| Install adequate and appropriate sanitary facilities for use by the workers at the construction site | Water resources Soils and geology Socio-economic | Contractor's Site Manager | Onsite sanitary facilities constructed. Onsite sanitary facilities are adequate (in terms of number of facilities in relation to the size of the construction crew), and appropriate | Prior construction |
| Put in place anti-vermin safeguards (such as covering bins with lids) | Socio-economic Air | Contractor's Site Manager | Anti-vermin safeguards in place | Throughout construction |
| Prior to project implementation, sensitise local communities about the project, the process of land acquisition – where this will be undertaken, as well as the potential project nuisances such as noise, dust and increased traffic. | Socio-economic Air | Contractor's Community liaison Officer | Readily available records of community sensitization having taken place | Prior construction |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|---|---|--|---|--|
| Limit the project footprint including materials lay down areas and material storage areas to only that which is required | Socio-economic Vegetation Soils and geology | Contractor's Site Manager | Project activities limited to within the boundaries of the acquired land | Throughout construction |
| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
| Conduct journey-specific risk assessments to include the identification of potentially sensitive receptors along the project traffic routes | Socio-economic Air | Contractor's Health and Safety Officer | Risk assessment matrices for approved project routes | Throughout construction |
| Sensitise communities/residents along the route about significant traffic movements, including transportation of construction materials to site | Socio-economic Air | Contractor's Community Liaison Officer | Readily available records of community sensitisation having taken place | Prior to scheduled significant traffic movements |
| Wherever possible, undertake traffic movements at the least busy times of the day | Socio-economic | Contractor's Health and Safety Officer | Availability of Journey Management Plans (JMPs) Readily available records indicating when traffic movements took place | Throughout construction |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|---|---|--------------------------------------|--|-------------------------|
| Monitor employment activities (encompassing those of the contractor), including number of jobs created by employment type (skilled / semi-skilled / unskilled); number of jobs by gender, employment type and geographical area; total man hours and wages paid, by employment type, gender and geographical area; and rate of employee turnover by gender and area | Socio-economic | Contractor's Human Resources Manager | Employment records available | Throughout construction |
| Maximise the participation of local community members during the construction phase. Recruit unskilled labour exclusively from directly affected communities and recruit semi-skilled labour preferentially from such communities, provided that they have the requisite skills, competence and desired experience. | Socio-economic | Contractor's Human Resources Manager | Employment records available providing clear indication of the employees from the project 's area of influence | Throughout construction |
| Undertake awareness and sensitisation campaigns on the dangers of sexually transmitted diseases including HIV/AIDS and methods of spread and control. The HIV/AIDs awareness trainers are expected to collaborate with local NGOs, CBOs and District Health Officers for sustainability and integration of activities | Socio-economic | Contractor's Human Resources Manager | Records of awareness and sensitisation campaigns available. | Bi-monthly |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|---|---|--|---|-------------------------|
| into the existing structures of the local health institutions. | | | | |
| Provide the workforce with access to basic first aid onsite | Socio-economic | Contractor's Health and Safety Officer | Basic first aid services available onsite | Throughout construction |
| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
| Maintain equipment on site within the designated equipment parking yard for the duration of construction to reduce on vehicle movements | Socio-economic Air | Contractor's Site Manager | Availability of a parking yard for construction equipment Readily available records of equipment movements | Throughout construction |
| Induct all workers in relevant codes of conduct that minimise exposure to risky life styles including unsafe sex practices. | Socio-economic | Contractor's Health and Safety Officer | Readily available records of inductions to be documented, including a list of participants. | Bi-monthly |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|--|---|--|---|--------------------------------------|
| Restrict vehicle movements to and from the project site to the project access road and prohibit off-road driving. | Vegetation Socio-economic Soils and geology | Contractor's Health and Safety Officer | Availability of clearly demarcated access routes to and from the project site. Grievances and complaints associated with off-road driving recorded in the complaints register. | Throughout construction |
| Restore sites where temporary project infrastructures were established during the construction phase such as by replanting affected areas with indigenous vegetation and avoiding intentional restoration using exotic plant species | Vegetation | Contractor's Environment Management System Officer | Re-vegetation of lay down areas following the completion of the construction phase Indigenous vegetation replanted and use of exotic plant species avoided | At the end of the construction phase |
| Inspect and examine potential sources of soil for the presence of invasive species and avoid excavation ²⁴ or otherwise completely eliminate the invasive species before excavation from these sources if any are found | Vegetation | Contractor's Environment Management System Officer | Readily available records identifying the location of the murram source and an indication that murram extraction points did not contain invasive species | Prior to murram extraction |
| Monitor invasive species for sprout and manage them accordingly | Vegetation | Contractor's Environment Management System Officer | Monitoring report on invasive species | Throughout construction |

²⁴ If a location has invasive plant species, there is still potential for the soils to have their seeds even if the shoots are uprooted.

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|-----------------------|---|--|----------------------|-------------------------|
| Management commitment | Applicable to the following environmental/social components | Responsible for monitoring and reporting on the commitment | | |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|--|---|--|----------------------|-------------------------|
| Maintain a speed limit of 40km/hr for light vehicles and 30km/hr for heavy vehicles on routes used to access the construction site, and where possible install speed calming measures along project routes | Air Socio-economic | Construction Operations Maintenance Community Environment Health Safety Security Other | | |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|-----------------------|---|-------------------------------|----------------------|-------------------------|
| | | financial records | | |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|-----------------------|---|-------------------------------|----------------------|-------------------------|
| | | Specified | | |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|-----------------------|---|---|----------------------|-------------------------|
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| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|-----------------------|---|---|----------------------|-------------------------|
| | | es s G r i e v a n c e s r e l a t e d t o s p e e d i n | | |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
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| | | g a l o n g p r o j e c t r o u t e s a s s r e c o r d e d | | |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
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| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|---|---|---|----------------------|-------------------------|
| Operate all emission generating equipment only when necessary, including avoidance of unnecessary idling of equipment | Air Socio-economic Fauna | C A T o v h n a r t i o r l u a a g c b h t i o o l u r i t ' t c s y o S o n i f s t w t e o r M r u a k c n i t a n i g s o e t n r r u c t i o n | | |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
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| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
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| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|-----------------------|---|---|----------------------|-------------------------|
| | | rd s o f i n c i d e n c e s a s s o c i a t e d w i t h | | |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|-----------------------|---|--|----------------------|-------------------------|
| | | unnecessary arbitrary operation at ion of emission | | |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|---|---|---|----------------------|-------------------------|
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| Develop and implement a grievance mechanism to address grievances from local stakeholders | Air Socio-economic | <div> <div>C</div> <div>G</div> <div>P</div> <div>o</div> <div>r</div> <div>r</div> <div>n</div> <div>i</div> <div>i</div> <div>t</div> <div>e</div> <div>o</div> <div>r</div> <div>v</div> <div>r</div> <div>a</div> <div>a</div> <div>c</div> <div>n</div> <div>o</div> <div>t</div> <div>c</div> <div>n</div> </div> | | |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|-----------------------|---|--|----------------------|-------------------------|
| | | o e s r m t ' e r s c u C h c o a t m n i m i o u s n n m i i T t n h y p r L l o i a u a c g i e h s o o n G u O r t f i c f e o f v n i a s c n t e c r r e u / c | | |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
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| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | | | Monitoring indicator | Frequency of monitoring |
|--|---|-------------------------------|---|---|----------------------|-------------------------|
| | | | e | d | | |
| Schedule noise events for appropriate times of the day to avoid disturbance of any programmed community gatherings | Socio-economic | C | R | T | | |
| | | o | e | h | | |
| | | n | a | r | | |
| | | t | d | o | | |
| | | r | i | u | | |
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| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
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| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | | | Monitoring indicator | Frequency of monitoring |
|--|---|---|--|---|----------------------|-------------------------|
| | | | t e d w i t h n o i s e e v e n t s | | | |
| Limit construction activities to only day time hours | Socio-economic | C o n t r a c t o r s | D e v e l o p m e n t | P e r m i t t e d | | |

December, 2022 Page 205 of 260

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|-----------------------|---|---|----------------------|-------------------------|
| | | <div> <div>y</div> <div>o</div> <div>a</div> <div>n</div> <div>v</div> <div>a</div> <div>i</div> <div>T</div> <div>l</div> <div>h</div> <div>a</div> <div>r</div> <div>b</div> <div>o</div> <div>l</div> <div>u</div> <div>e</div> <div>g</div> <div>r</div> <div>h</div> <div>e</div> <div>o</div> <div>c</div> <div>u</div> <div>t</div> <div>r</div> <div>c</div> <div>d</div> <div>o</div> <div>s</div> <div>n</div> <div>c</div> <div>s</div> <div>h</div> <div>t</div> <div>e</div> <div>r</div> <div>c</div> <div>u</div> <div>k</div> <div>c</div> <div>i</div> <div>t</div> <div>n</div> <div>i</div> <div>o</div> <div>p</div> <div>n</div> <div>r</div> <div>o</div> <div>g</div> </div> | | |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|-----------------------|---|-------------------------------|----------------------|-------------------------|
| | | responsible | | |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|-----------------------|---|---|----------------------|-------------------------|
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| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|-----------------------|---|-----------------------------------|----------------------|-------------------------|
| | | compilants / grievance mechanisms | | |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|-----------------------|---|--|----------------------|-------------------------|
| | | <div>e</div> <div>d</div> <div>w</div> <div>i</div> <div>t</div> <div>h</div> <div>n</div> <div>u</div> <div>i</div> <div>s</div> <div>a</div> <div>n</div> <div>c</div> <div>e</div> <div>s</div> <div>s</div> <div>u</div> <div>c</div> <div>h</div> <div>a</div> <div>s</div> <div>n</div> <div>o</div> <div>i</div> <div>s</div> <div>e</div> <div>e</div> <div>v</div> <div>e</div> | | |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|-----------------------|---|---|----------------------|-------------------------|
| | | <div> <div>n</div> <div>t</div> <div>s</div> <div>,</div> <div>m</div> <div>a</div> <div>d</div> <div>e</div> <div>o</div> <div>u</div> <div>t</div> <div>s</div> <div>i</div> <div>d</div> <div>e</div> <div>d</div> <div>a</div> <div>y</div> <div>t</div> <div>i</div> <div>m</div> <div>e</div> <div>h</div> <div>o</div> <div>u</div> <div>r</div> <div>s</div> </div> | | |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|--|---|---|----------------------|-------------------------|
| Prohibit unnecessary noise from the construction crew (such as loud vocalisations and music) | Socio-economic | C o n t r a c t o r s ' s S u r v e i l l a n c e r s | | |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|--|---|--|----------------------|-------------------------|
| Provide workers involved in construction activities with the requisite Personal Protective Equipment | Socio-economic | Construction Sector Regulator Ministry of Energy and Petroleum Engineering | | |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|-----------------------|---|---|----------------------|-------------------------|
| | | Construction Restructuring Production Investment Equipment Power Environment Social Health Safety Labor Waste Other | | |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|-----------------------|---|--|----------------------|-------------------------|
| | | <div> <div> e r s a t a l l t i m e s a s r e q u i r e d . R e a d </div> <div> c r i t i c i a l r e v i e w e d . R e a d </div> </div> | | |

December, 2022 Page 216 of 260

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|-----------------------|---|--|----------------------|-------------------------|
| | | <div>S</div> <div>S</div> <div>O</div> <div>C</div> <div>I</div> <div>A</div> <div>T</div> <div>E</div> <div>D</div> <div>W</div> <div>I</div> <div>T</div> <div>H</div> <div>P</div> <div>O</div> <div>O</div> <div>R</div> <div>U</div> <div>S</div> <div>E</div> <div>A</div> <div>N</div> <div>D</div> <div>/</div> <div>O</div> <div>R</div> <div>P</div> <div>O</div> <div>O</div> <div>R</div> <div>Q</div> | | |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|---|---|--|--|-------------------------|
| | | Availability of PPE | | |
| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
| Operations Phase | | | | |
| Ensure development, maintenance and update of the project spill contingency plan. | Water resources Soils and geology | Contractor's Environment Management System Officer | Spill contingency plan available onsite and regularly updated, as and when necessary | Throughout operations |
| Train staff in the use of spill cleaning equipment | Water resources Soils and geology | Contractor's Environment Management System Officer | Readily available records of training having taken place available | Prior to operations |

| | | | | |
|--|--|--|--|-----------------------|
| Continue to ensure that the local community 's water supply is not adversely affected | Ground water resources Socio-economic | Contractor's Community Liaison Officer | Record of regular consultations with the local community and no record of complaints related to water supply from the local community | Throughout operations |
| Ensure that all waste generated from O&M activities is properly collected in a designated area (provide separate waste skips for collection of different categories of waste (biodegradable, non-biodegradable, hazardous and non-hazardous wastes)), and handled prior to disposal. | Socio-economic Water resources Soils and geology | Contractor's Site Manager | Clearly defined designated area for the collection of waste (waste shade) Properly labelled waste skips for collection of different categories of waste. Contracted licensed waste handler available on site. Waste slips indicating the management of hazardous wastes | Throughout operations |

| Management commitment | Applicable to the following environmental/social components | Responsibility for commitment | Monitoring indicator | Frequency of monitoring |
|-----------------------|---|-------------------------------|----------------------|-------------------------|
| Decommissioning Phase | | | | |

| | | | | |
|--|--|---------------------------|---|--|
| Halt demolition activities, and recover the pollutant immediately in the event of oil leakages, spillages, sedimentation and siltation | Water resources Soils and geology Socio-economic | Contractor's Site Manager | Clearly defined spillage management procedure. Training in spill management and records of training having taken place. Presence of spill clean-up kits. A record of spills and how these were managed included in the incidents register. | Throughout the duration of decommissioning |
| Install mobile sanitation facilities for use by the demolition crew and empty them regularly. | Water resources Soils and geology Socio-economic | Contractor's Site Manager | Availability of mobile sanitation facilities on site. | Throughout the duration of decommissioning |
| Ensure that all waste generated from decommissioning activities is properly collected in a designated area (provide separate waste skips for collection of different categories of waste (biodegradable, non-biodegradable, hazardous and non-hazardous wastes)), and handled prior to disposal. | Socio-economic Water resources Soils and geology | Contractor's Site Manager | Clearly defined designated area for the collection of waste (waste shade) Properly labelled waste skips for collection of different categories of waste. Contracted licensed waste handler available on site. | Throughout the decommissioning phase |

ANNEX XI: TERMS OF REFERENCE (TOR) FOR PREPARATION OF AN ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

TABLE OF CONTENTS

| | | |
|--------|---|-----------|
| 1. | <u>BACKGROUND.....</u> | <u>1</u> |
| 1.1. | <u>CONTEXT.....</u> | <u>1</u> |
| 1.2. | <u>PROJECT COMPONENTS</u> | <u>2</u> |
| 1.3. | <u>ENVIRONMENTAL AND SOCIAL RISK RATINGS OF THE PROJECT</u> | <u>3</u> |
| 1.4. | <u>THE ENERGY ACCESS PROJECT INFRASTRUCTURE INVESTMENTS / SUBPROJECTS</u> | <u>5</u> |
| 2. | <u>OBJECTIVES OF THE CONSULTANCY SERVICE</u> | <u>5</u> |
| 3. | <u>SCOPE OF WORK AND EXPECTED OUTPUT.....</u> | <u>6</u> |
| 3.1. | <u>GENERAL.....</u> | <u>6</u> |
| 3.2. | <u>INTRODUCTION.....</u> | <u>6</u> |
| 3.3. | <u>LEGAL AND INSTITUTIONAL FRAMEWORKS.....</u> | <u>7</u> |
| 3.4. | <u>PROJECT DESCRIPTION</u> | <u>8</u> |
| 3.5. | <u>ENVIRONMENTAL AND SOCIAL BASELINE CONDITIONS</u> | <u>9</u> |
| 3.6. | <u>ENVIRONMENTAL AND SOCIAL RISKS & IMPACTS</u> | <u>9</u> |
| 3.7. | <u>ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES.....</u> | <u>11</u> |
| 3.8. | <u>ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLANS</u> | <u>11</u> |
| 3.9. | <u>CAPACITY DEVELOPMENT AND TRAINING</u> | <u>12</u> |
| 3.10. | <u>IDENTIFYING AND ANALYSIS OF ALTERNATIVES</u> | <u>12</u> |
| 3.11. | <u>STAKEHOLDER IDENTIFICATION, CONSULTATIONS, AND GRIEVANCE REDRESS MECHANISM.....</u> | <u>13</u> |
| 3.12. | <u>CONCLUSIONS AND RECOMMENDATIONS.....</u> | <u>13</u> |
| 4. | <u>DELIVERABLES.....</u> | <u>13</u> |
| 4.1.1. | <u>Inception Report</u> | <u>14</u> |
| 4.1.2. | <u>Environmental and Social Impact Assessment (ESIA) Report</u> | <u>14</u> |
| 5. | <u>TIMELINE OF THE CONSULTANCY SERVICE.....</u> | <u>14</u> |
| 6. | <u>CONSULTANT’S TEAM AND QUALIFICATIONS</u> | <u>15</u> |
| 7. | <u>CONSULTANT’S PROPOSAL</u> | <u>16</u> |
| 8. | <u>CLIENT’S SUPPORT.....</u> | <u>16</u> |
| 8. | <u>ANNEX A : INDICATIVE OUTLINE FOR ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)</u> | |
| 9. | <u>REPORT.....</u> | <u>18</u> |

1. BACKGROUND

1.1. CONTEXT

South Sudan is a landlocked country that lies between latitudes 3°N and 13° N and longitudes 24°E and 36°E. The country's territory covers 644,329 km² and has many plains and plateaus that are drained by the Nile and its numerous tributaries. The country declared its independence from Sudan in July 2011. South Sudan is endowed with a wealth of biodiversity, which provides the country with great opportunity for socioeconomic development, as well as many biological resources that have considerable economic and social values. The country has a wide range of habitats, including lowland forest, montane forest, savannah woodland, savannah grassland, wetlands and floodplains, the Sudd Wetland, and the semi-arid region in the north, which support a very rich diversity of animal and plant species. However, such biodiversity, including wildlife, is currently under threat, due to weak environmental regulation, poor development planning, fires, and most importantly, fragility resulting from conflict, instability, and insecurity. Households in South Sudan predominantly use biomass to meet their energy needs, which involves burning charcoal, wood, grass, cow dung and agricultural residues. Over 96% of the population use firewood or charcoal as their primary fuel for cooking. Firewood, grass and paraffin lamps are the most used sources for lighting. Costly diesel generators are mostly used to produce the electricity, as there is no national grid electricity supply (Government of South Sudan Initial National Communication to the United Nations Framework Convention on Climate Change, 2018).

South Sudan has experienced various armed conflicts since 1955. Ongoing tensions with Sudan over oil revenues, land borders, armed groups, rebellions, and inter-communal violence have threatened South Sudan since its independence in 2011. These tensions have resulted in frequent conflicts, which have adversely impacted the environment, the South Sudanese people and the country's natural resources (South Sudan First State of Environment and Outlook Report 2018). In 2013, additional civil war among internal factions – along ethnic and clan lines - left the country shattered. In September 2018 a peace agreement was signed between the warring factions. However, local conflicts still flare up following the agreement. While the situation remains fluid, the recent reduction in armed conflict may facilitate substantial population movement. About 1.3 million people have returned from displacement within or outside South Sudan since 2016. The risk of spread of Coronavirus Disease (COVID-19) is high. The pandemic could push the people, especially the vulnerable poor and the displaced, deeper into destitution and the country faces the risk of further destabilization.

The power sector in South Sudan is experiencing severe shortage of supply and extraordinarily high electricity tariffs. The country's total installed power capacity is approximately 141 MW; however, power demand is estimated at 300 MW, an amount that is expected to grow during peacetime. Much of the country's generation is currently not operational due to lack of fuel and spare parts. Urban centers outside of Juba, such as Malakal and Wau each had isolate grid infrastructure that were destroyed during the conflict of 2013. Furthermore, due to the high cost of imported fuel, grid customers in Juba pay an average tariff of 42 US cents per kWh, which is among the highest in Africa despite the poor quality of supply.

The proposed project focuses on increasing access to electricity in urban, peri-urban and rural areas through mini-grids and off-grid solutions. Recent energy sector development efforts have focused on revitalizing

infrastructure and boosting power generation around Juba, the capital city, but the rest and largest part of the country remains in the dark. Only two other urban areas outside of Juba (Renk and Bor) have access to a grid that is supported by SSEC.

1.2. PROJECT COMPONENTS

The Project Development Objective (PDO) is *to increase access to electricity services and strengthen the institutional capacity of electricity sector in South Sudan*. The project will finance activities that provide energy access in South Sudan. The proposed project will have four main components: (1) Juba isolated grid extension/densification; (2) Construction mini grid pilots in Jam Jang or Maban; (3) Off-grid electrification through standalone solar systems; and (4) Technical Assistance and capacity building. The details of the components are:

1. **Component 1: Juba isolated grid extension/densification.** The Juba power distribution system has more than 30,000 customers of which 70% of these are households. The system faces a number of challenges that include financial constraints by the government and JEDCO to expand the network and provide more access to an additional 100,000 households; power theft, arrears by institutions; and a lack of an independent regulator with strong measures. Therefore, this component of the project will entail partial implementation of the so-called second phase of the African Development Bank Group (AfDB) Juba distribution project. It will involve performing additional 16,000 connections (for densification of the existing grid, out of which 10,000 will be connected from 24 existing idle transformers). Additionally, network strengthening (intensification) will be undertaken for an additional 15,000 connections that will be extended to major IDP camps in Juba. Other items under this component include:
 - Developing masterplans to benefit South Sudan's energy sector (such as the Juba Distribution Masterplan)
 - Supporting additional studies for evacuation of power from intermittent sources
 - Supporting the establishment of an energy sector regulator and tariff setting mechanism
 - Capacity building for the South Sudan Electricity Corporation (SSEC) and Ministry of Energy and Dams (MoED).
2. **Component 2: Construction mini grid pilots in Jam Jang or Maban.** The objective of this component is to electrify South Sudanese communities and adjacent refugee camps with a solar hybrid system that has battery storage or a diesel backup. This component supports energy access in refugee host communities such as Pariang in Ruweng administrative area and the refugee camps, particularly, in Maban and/or Jamjang. These will benefit from affordable and reliable electricity service. It should be noted that each refugee camp has an estimated population of 100,000 – 150,000 people (*approximately 60,000 households and 80% of the refugee population being concentrated in Maban and Jamjang areas*) and 20 – 30 public facilities/markets that are similar to secondary cities in South Sudan.

The component will be financed through the World Bank Window for Host Communities and Refugees (WHR), with additional potential financing expected from the private sector.

The United Nations High Commissioner for Refugees (UNHCR) and public facilities are anchor customers and implementation partners on this component. The new mini grids would displace expensive diesel shipments.

3. **Component 3: Off-grid electrification through standalone solar systems.** This component will entail electrification of public institution facilities that include health and educational facilities. A total of 1,654 health facilities and 5,580 educational facilities have been identified to benefit from this component. Most of these are located outside major cities that have no grid access. The component will finance the delivery of solar and battery-based off-grid solutions for selected social institutions, with priority on Payam-level Health Care Centres (PHCCs) and secondary schools. Other public facilities such as government administration buildings and publicly shared water supply facilities will also be supported.

The component will be implemented through a combination of public and private sector led approaches with a focus on efficient delivery channels to ensure long-term sustainability of installed systems.

4. **Component 4: Technical Assistance and capacity building.** This component involves a broad range of analytical work/technical assistance and capacity building to support implementation of the three components highlighted above. The aim of this component will be to prepare the MoED for sustainable long-term development of South Sudan's power sector. This will entail:

Technical assistance aspects

- Development of sector Master plans that focus on electricity generation, transmission, distribution and electrification
- Undertaking feasibility studies for new construction/rehabilitation of isolated grids in regional capitals, including Malakal
- Review and Strengthening of the regulatory framework
- Development of the Public-Private Partnership (PPP) framework
- Juba cost of service / tariff setting study, supplementing component 1 intervention
- Development of business plans/Human Resource plans for key sector entities.

Capacity building

- Trainings for MoED/SSEC/ Project Implementation Unit (PIU)
- Study tours and knowledge exchange
- Incentives and resources for sector agency staff (non-monetary employment benefits, equipment, IT systems, etc.).

NB: The MoED and the World Bank (WB) are to identify priority activities under this component since it is unlikely that all the activities above will be financed under this project.

1.3. ENVIRONMENTAL AND SOCIAL RISK RATINGS OF THE PROJECT

Environmental Risk Rating - High

There are various potential environment, health and safety risks that can result during construction and operation of the off-grid and mini-grid products and materials as well as associated civil works. These include (i) Generation of hazardous and non-hazardous wastes including e-wastes (from Component 1, 2, and 3 activities). A solar power system involves the use of rechargeable batteries including lithium-ion, nickel metal hydride, nickel cadmium and lead acid batteries. These batteries, especially nickel cadmium and lead acid batteries can have potential for environmental and health impacts if not properly transported, stored, and disassembled/recycled. They can cause serious environmental impacts because of the chemicals and heavy metals. Another emerging environmental issue associated with solar PV energy systems is exhausted solar panels. Leachate generated on landfills of PV solar panels could cause water/ground pollution. There are also potential environmental risks that can result from the use of back up diesel generators. Gensets (diesel generators) can contribute to air pollution during operation and may account for water/ground pollution from fuel spill overs during transportation and storage. Other pollutants include packaging materials of PV panels, battery banks, etc. Localized air quality pollution could result from operating machinery (i.e., fumes) and dust generation from earthworks. Wooden poles for distribution are treated with chemicals during manufacturing that can lead to leaching and the formation of surface residues at the right-of-way. (ii) Small scale soil erosion, sedimentation, and landscape disturbance (from Component 1, 2 and 3 activities). This may result from civil works of mini grids which among others include the construction of a powerhouse for the storage of the battery banks, genset, battery inverters and combiner boxes as well as during erection of distribution network poles. (iii) Potential risks to flora and fauna. Wooden poles may be used for distribution line construction purpose which can lead to cutting of considerable number of trees. Vegetation clearance under and around mini grids in order not to obscure the incoming solar radiation, clearance of Right of Way (ROW), fuel and oil leakages (during transportation and storage) can affect wildlife and ecosystems. Accidental fire which could be caused by Vegetation/trees falling on distribution network cables, in case of large mini-grid systems with high current and voltage levels due to high magnetic fields), improperly stored/handled, fuel and overheating of battery banks etc. may have adverse impacts on flora and fauna. (iv) Potential use of energy by health care facilities, schools, public buildings, and enterprises/farmers. Construction and operation activities of the project may lead to use of energy resource for different construction and operation related activities. (v) Potential risks to workers and community health and safety. Construction and operation activities may expose project workers to various accidents. Occupational accidents can occur in all stages of the life cycle of off-grid solar materials from manufacturing, installation, and maintenance to decommissioning and recycling. The transportation of materials and machinery may lead to increase in traffic congestion and road accidents. Diesel generators, vehicles, and construction machineries activities can cause an increase in the noise levels which can affect project workers and the communities residing near the project site. Technical assistance activities may also have potential downstream risks if not implemented following the requirements of the ESF. At this stage, considering the above potential environmental risks as well as major contextual risks including the limited capacity of Ministry of Energy and Dams, the environmental risk of the project is rated as high.

Social Risk Rating - High

The risk classification of the project is high, considering the broader contextual risk such as political instability (induced by potential civil unrest), contextual GBV/SEA risk, accessibility of subprojects for monitoring and support, proper utilization, and implementation of Project's environmental and social risk management tools. The project is not complex or large in scale, does not involve activities that have a high potential for harming people. Social impacts associated with project activities will generally emanate from the construction of grid system, hybrid and solar PV battery storage mini grid for households and enterprises that are assigned to Component 1, 2 and 3 of the Project. These include small scale land acquisition and/or livelihood disruption, risks linked to non-compensation for affected crops and trees, influx of labor into targeted areas (though not significant), lack of adequate consultation with affected persons and access to functioning grievance redress mechanisms, as well as social exclusion of women, youth, and other members of underserved and vulnerable groups, including refugees and host communities (potential targets of the Project). Apart from the project related risk there is a broader contextual risk on security and Sexual exploitation and harassment risks in South Sudan. Hence, the social risk of the project is rated as high.

1.4. THE ENERGY ACCESS PROJECT INFRASTRUCTURE INVESTMENTS / SUBPROJECTS

Apart from the technical assistance and capacity building activities of the *South Sudan Energy Access Project*, there are other subproject activities under Components 1, 2, and 3 whose implementation will involve the undertaking of physical installations, construction, and operational works. The type of subproject activities which are anticipated to have impacts on the biophysical and social environment are:

- Densification of the existing grid in Juba for additional connections. This will involve installation of electric poles, stringing of conductors, installation of energy meters, and other connection works.
- Grid extensions to major IDP camps in Juba. This will entail installation of electric poles, installation of transformers, stringing of conductors, and installation of energy meters and other accessories.
- Electrify communities and adjacent refugee camps with a solar hybrid system that has battery storage or a diesel backup.
- Electrification of public institution facilities that include health and educational facilities through solar and battery-based off-grid solutions.

2. OBJECTIVES OF THE CONSULTANCY SERVICE

The technical services of an independent environmental and social consultant ("Consultant") is required to perform an **Environmental and Social Impact Assessment (ESIA)** study for the **South Sudan Energy Access Project Infrastructure Investment/Subproject** ("Project"). The main objectives of the environmental and social impact assessment study are:

1. To prepare an environmental and social impact assessment of the *South Sudan Energy Access Project* infrastructure investment to ensure its environmental and social sustainability.
2. To analyze, evaluate, and recommend measures to avoid, minimize, mitigate, and compensate/offset potential environmental and social impacts of the infrastructure investment/subproject so that it complies with the national, international, and World Bank's legislations, policies and frameworks.

3. To prepare environmental and social management and monitoring plans for implementation and operation phases of the infrastructure investment/subproject.
4. To conduct meaningful consultations with stakeholders including analysis of interested and affected parties and dissemination of information about the project infrastructure investment/subproject.

3. SCOPE OF WORK AND EXPECTED OUTPUT

3.1. GENERAL

In general, the Consultant will perform the following key tasks as part of the Environmental and Social Impact Assessment (ESIA) study of the *South Sudan Energy Access Project* infrastructure investment:

1. Describe the *South Sudan Energy Access Project* infrastructure investment (or subproject) including its main components, ancillary components/facilities, resources input, and outputs/produces.
2. Establish baseline environmental and social settings of the infrastructure investment influence area.
3. Establish legal and institutional frameworks under which the project is implemented and operated.
4. Identify beneficial and adverse environmental and social risks and impacts of the project during implementation and operation periods.
5. Propose suitable, practical, and site-specific enhancement and mitigation measures to avoid, reduce, mitigate, and compensate/offset the identified impacts with operational details.
6. Conduct meaningful stakeholders' consultations and analysis to capture the project affected people and parties' aspirations, concerns, and recommendations towards the planned interventions.
7. Carry out alternative analysis and compare various project planning and design options in terms of their environmental and social consequences.
8. Develop environmental and social management and monitoring plans with institutional arrangement, human resources, and budget requirement.
9. Develop specific environmental and social requirements and procedures to be included in contractor's contract documents.

Further, the details of the various activities and outputs of the ESIA are described in the below sections.

3.2. INTRODUCTION

At the onset of the environmental and social impact assessment study, the following key aspects of the *South Sudan Energy Access Project* should be defined and described in detail.

The Project (the *South Sudan Energy Access Project*) background/context

- The specific project infrastructure investment/subproject background/context
- Rationale for the project infrastructure investment/subproject
- The objectives of the ESIA
- The scope of the ESIA
- Approach/methodology of the ESIA, and
- The structure of the ESIA report.

3.3. LEGAL AND INSTITUTIONAL FRAMEWORKS

A detailed review of relevant national, regional, international and World Bank regulatory frameworks shall be made to establish the setting against which the project will be implemented. The review shall include (but not limited to):

Applicable national policies and strategies for water, environmental, and social management including (but not limited to):

- Environment Policy of South Sudan (2015 – 2025)
- The South Sudan Forest Policy (2019)
- The National Gender Policy (2012 – 2017)
- South Sudan's Vision 2040

Applicable national legislations (proclamation, regulations, directives, guidelines) for water, environmental and social management including (but not limited to):

- The Transitional Constitution of the Republic of South Sudan (2011)
 - The Draft Environment Protection Bill (2015)
 - National Electricity Bill (2015)
 - The Land Act (2009)
 - The Labor Act (2017)
 - Local Government Act (2009)
 - The Environmental Protection Act (2001)
 - Forests and Renewable Natural Resources Act (2002)
 - South Sudan Access to Information Act No. 65 of 2013
-
- Applicable relevant regional and international conventions and protocols (ratified by South Sudan)
 - Applicable regional agreements, cooperative frameworks, guidelines, etc. including on energy sector and associated environmental and social management
 - The World Bank's Environmental and Social Framework (ESF), the relevant Environmental and Social Standards (ESSs) are:
 - ESS1 Assessment and Management of Environmental and Social Risks and Impacts
 - ESS2 Labor and Working Conditions
 - ESS3 Resource Efficiency and Pollution Prevention and Management
 - ESS4 Community Health and Safety
 - ESS5 Land Acquisition, Restrictions on Land Use and Involuntary Resettlement
 - ESS6 Biodiversity Conservation and Sustainable Management of Living Natural Resources
 - ESS7 Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities
 - ESS8 Cultural Heritage
 - ESS10 Stakeholder Engagement and Information Disclosure

- Applicable guidelines from the World Bank Group's Environmental, Health, and Safety (EHS) Guidelines including:
 - The General EHS Guidelines (environmental, occupational health and safety, community health and safety, and construction and decommissioning)
 - Electric Power Transmission and Distribution (2007)

Compatibility analysis of the World Bank's environmental and social requirements, as set in the ESF and EHS guidelines, vis-à-vis the national regulatory frameworks and guidelines shall be made to identify any gaps between the two that will be reflected during project implementation and operation. Further, recommendation shall be given to narrow or address the identified gaps.

In addition, the national, regional, and local institutional frameworks under which the project will be implemented shall be identified and assessed as part of the ESIA. Relevant institutions, their mandates, institutional structure, and capacities shall be identified. The key institutions include:

- Ministry of Energy and Dams (MoED)
- Ministry of Environment and Forestry
- Directorate of Climate Change and Meteorology
- Ministry of Finance and Planning
- Ministry of Health
- Ministry of General Education and Instruction
- Ministry of Internal Affairs
- Ministry of Humanitarian Affairs and Disaster Management
- Ministry of Labor, Public Service and Human Resource Development
- Ministry of Gender, Social Welfare and Religious Affairs
- South Sudan Electricity Corporation (SSEC).

Potential gaps in the institutional frameworks that need action shall be identified and described in the ESIA. The structure and capacity of the institutions responsible for implementation of the project shall be assessed in detail. Other relevant organizations and institutions shall be identified, and their structures, relationships, roles, responsibilities, and capacities shall be assessed and described.

3.4. PROJECT DESCRIPTION

The *South Sudan Energy Access Project* infrastructure investment shall be described comprehensively including the following (but not limited to):

- The *South Sudan Energy Access Project*
 - The Project development objectives
 - The Project components and subcomponents
 - The Project environmental and social risks ratings
 - The Project beneficiaries
 - The Project implementation arrangement

- The specific project infrastructure investment/subproject
 - The location of the infrastructure investment (geographic and administrative locations), with location map(s)
 - Specific site location
 - Accessibility of the site
 - The project intervention design and its main components
 - Construction materials used for construction of various components of the project including sources of the construction materials (market or own source)
 - Machineries to be used during construction and operation of the project
 - Energy consumption for the project
 - Waste generated from the project
 - Human resources requirements during implementation and operation phases
 - Project implementation activities (during pre-construction, construction, and operation/maintenance stages)
 - Project implementation schedule.

The project description shall form a basis for the ESIA including to establish environmental and social baseline conditions, identifying and prioritizing key environmental and social issues, and recommending measures to avoid, reduce, mitigate, and offset the identified impacts.

3.5. ENVIRONMENTAL AND SOCIAL BASELINE CONDITIONS

Environmental and social baseline conditions against which the project will be implemented shall be described in detail. The basic environmental and social baseline conditions of the projects influence area shall include:

- The physical environment (climate, topography, geology/geomorphology, soils, water resources, land use, land cover, etc.)
- The biological environment (flora, fauna, key biodiversity areas, natural, critical, and modified habitats)
- The socio-economic environment (demography, ethnic composition, traditionally underserved communities, social structures, religions, cultural heritages, settlement patterns/land uses, livelihood

strategies, household income and employment, food security, access to social services and utilities, etc.).

The environmental and social baseline conditions shall be done through desk study and field surveys. Gaps and reliability of baseline data used for the description shall be identified and indicated in the assessment. Recommendations on baseline data that should be confirmed or validated shall be provided.

3.6. ENVIRONMENTAL AND SOCIAL RISKS & IMPACTS

The ESIA shall identify and evaluate significance of potential environmental and social risks and impacts that will result from implementation of the *South Sudan Energy Access Project* infrastructure investment/subproject. The ESIA shall focus on environmental and social effects that are significant in their likelihood and consequences. Further, the impacts identified shall be both beneficial/positive and adverse/negative impacts. The nature of the impacts shall be described as direct/indirect/induced/cumulative, temporary/long-term, local/regional, and reversible/irreversible. The environmental and social risks and impacts to be identified shall consider the following key aspects:

- The project beneficial impacts shall be identified including (but not limited to) the following:
 - Improved reliability of electric supply
 - Improved access to clean and reliable electricity
 - Job opportunities and skill development
 - Improved standard of living
 - Improved security and safety
 - Benefits to education and health facilities
 - Environmental benefit
 - Poverty reduction
 - Strength institution capacity
- The project adverse impacts shall be identified including (but not limited to) the following:

i. Environmental

- Air emissions/fugitive dust and ambient air quality impacts
- Impact on water quality
- Noise and vibration impacts
- Impacts of waste generation and disposal
- Polychlorinated biphenyls (PCBs) and SF6 impacts
- Impact of hazardous waste
- Impact due to non-hazardous waste
- Impact of loss of soil and land degradation

- Impact due to clearing of vegetation cover and disturbance of habitat
- Impact of biodiversity loss
- Bird strikes/collisions and electrocution
- Health effects of electromagnetic fields (EMF)
- Visual impacts

ii. Occupational health and safety

- Physical hazards including (i) rotating and moving equipment/machineries, (ii) noise and vibration, (iii) electrical hazard, (iv) eye hazards due to flying debris, (v) hazards from hot works, (vi) traffic accidents from the site traffic and offsite movements of project vehicles/trucks, (vii) work-at-height, (viii) excavation hazards, (ix) ergonomics, repetitive motion, manual handling, (x) working environment temperature and illumination, (x) poor housekeeping, slip, trip, fall
- Chemical hazards including (i) poor air quality, (ii) fire and explosions, (iii) hazardous chemical
- Biological hazards including (i) exposure to wastewater, (ii) transmittable diseases/infections
- Special hazard environments such as (i) confined space, (ii) lone and isolated worker

iii. Community health and safety

- Water quality and availability
- Structural safety of project interventions
- Fire risk
- Traffic risk
- Risk from hazardous materials/wastes during transport and disposal
- Transmittable disease and public health impact

iv. Social

- Social conflicts/dissatisfaction on services
- Conflict between local and migrant workers
- Labor influx
- Impact on child labor and young worker

v. Risks related to development and operation of ancillary facilities (if any).

- The risks/impacts shall be segregated by project phases, i.e., (i) pre-construction, (ii) construction, (iii) operation and maintenance, and (iv) decommissioning.

- In addition to the direct and/or indirect impacts, the cumulative impacts (aggregate, incremental, and synergistic impacts) of project implementation in the project area of influence shall be comprehensively identified. The cumulative project impacts shall be distinguished between their national, regional, and local effects.
- The environmental and social impacts shall consider identified challenges during project planning, design, and implementation.
- The identified environmental and social impacts shall be prioritized based on their risk significance, magnitude, spatial and temporal extent.

3.7. ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES

Potential environmental and social risks/impacts that will result from project implementation and operation shall be provided with recommendations on impacts enhancement or mitigation measures. The recommended measures shall be based on the risk mitigation hierarchy of avoidance, reduction, mitigation, and compensation/offsetting. The proposed mitigation measures shall bring the adverse impacts to the levels required by national standards and guidelines, the World Bank environmental and social framework and EHS guidelines, and good international industrial practice. The recommended mitigation measures shall also be commensurate with the level or significance of the adverse impacts. The mitigation measures should have operational details to enable their implementation. The mitigation measures shall be presented as environmental and social requirements or clauses to be included in contractors' works contract documents.

3.8. ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLANS

The ESIA should develop an environmental and social management plan outlining procedures and institutional responsibilities to manage the identified impacts. The environmental and social management plan shall include:

- Potential environmental and social benefits and impacts resulting from project implementation (identified in the earlier exercise)
- Type, extent, and significance of the benefits and impacts
- Recommended enhancement measures for the beneficial/positive impacts
- Recommended mitigation measures for the adverse impacts to enable the sustainable implementation and operation of the project
- Location of the mitigation measures within the project setup
- Frequency of mitigation or measures implementation timeframe
- Success indicators for the mitigation measures
- Institutional responsibility for implementation of the enhancement or mitigation measures
- Capacity building recommendations for the institutions
- Estimate of measures implementation budget.

An environmental and social monitoring plan for project implementation and operation shall be recommended in the ESIA. Main components of the monitoring plan are:

- Potential environmental and social benefits and impacts resulting from project implementation (identified in the earlier exercise)
- Recommended enhancement and mitigation measures
- Key project parameters or aspects to monitor
- Specific and measurable indicators
- Monitoring location, if applicable
- Measurement methods and/or equipment
- Frequency of monitoring
- Responsible institutions/parties for monitoring
- Monitoring budget.

3.9. CAPACITY DEVELOPMENT AND TRAINING

For effective implementation of the environmental and social management and monitoring plans, the existing institutional capacity of the concerned parties shall be assessed and measures to strengthen their capacities (such as training) shall be recommended.

3.10. IDENTIFYING AND ANALYSIS OF ALTERNATIVES

The ESIA shall identify (along with the project design team) various project implementation alternatives including:

- The 'no-action' option which considers maintaining the current status quo in the project influence area
- The 'proposed project' option including all of its technologies, facilities and activities
- 'Other options' to be identified as part of the ESIA which are deemed to achieve the overall objectives of the project while using different technology, methodology, and facilities.

A multi-criteria approach shall be used for analysis of the identified project alternatives.

3.11. STAKEHOLDER IDENTIFICATION, CONSULTATIONS, AND GRIEVANCE REDRESS MECHANISM

Stakeholder identification and analysis shall be done as part of the environmental and social impact assessment with the objective of involving the stakeholders in the decision-making process. The main tasks include:

- Identify project stakeholders including government bodies/authorities, beneficiary communities, indigenous people, community leaders, civil society organizations, non-governmental organizations, women groups, youth groups, academia, etc.
- Disclose project information to the stakeholders
- Consult on stakeholders' understanding, views, aspirations, and recommendations on the project

- Recommend ways to integrate the findings of the stakeholder engagement into the project plan, design, and implementation.

Project stakeholders may have grievances during implementation and operation stages and thus stakeholders should be given a means to voice their grievances and obtain redress. The ESIA shall device a grievance redress mechanism appropriate for the project and local communities.

3.12. CONCLUSIONS AND RECOMMENDATIONS

Conclusions shall be drawn from the key findings of the ESIA. Further, the ESIA shall provide recommendations based on the findings of the assessment. The recommendations shall, among other points, include:

- Promoting integration and collaboration on environmental and social management by the various stakeholders participating during the project implementation and operation
- Strengthening institutions responsible for implementation and management of environmental and social issues
- Capacity building needs for institutions responsible for environmental and social management
- Dissemination and disclosure of environmental and social information
- Environmental and social requirements and management measures to be included in the works contract documents
- Recommendations on other key environmental and social management issues.

4. DELIVERABLES

The documents to be prepared as part of the Environmental and Social Impact Assessment (ESIA) study are *an Inception Report, Draft and Final Environmental and Social Impact Assessment (ESIA) Reports*. The Consultant should prepare the draft and final versions of the ESIA to the desired and acceptable quality to avoid several iterations of the plan. Detailed description and contents of the reports are presented in the below sections.

4.1.1. Inception Report

An *Inception Report* which presents the consultant's specific and revised work plan, proposed stakeholders consultation plan, and the availability of agreed experts for the duration of the assignment, shall be submitted within a week of commencement of the assignment.

4.1.2. Environmental and Social Impact Assessment (ESIA) Report

Draft and final *Environmental and Social Impact Assessment (ESIA) Reports* shall be prepared consisting of a detailed summary of the information collected and analysis made (see *Annex A* for suggested ESIA report outline). The ESIA reports shall consist of:

- The project background, rationale and objectives
- The objectives, scope, approach, and structure of the ESIA
- Relevant legal and institutional frameworks
- Description of the project and its activities
- Environmental and social baseline conditions
- Environmental and social risks and impacts
- Environmental and social mitigation, management, and monitoring measures
- Environmental and social management and monitoring plans
- Analysis of alternatives
- Stakeholders' analysis and disclosure plan
- Conclusions and recommendations.

The draft ESIA report shall be presented to stakeholders (in a workshop to be organized) to solicit comments and suggestions. The final ESIA report shall be prepared incorporating the client's and other stakeholders' comments and suggestions on the draft ESIA. Both documents are to be written in English and the documents shall be electronically submitted in *MS Word* and *PDF* file formats.

5. TIMELINE OF THE CONSULTANCY SERVICE

The table below summarizes the timeline of the consultancy service.

| | Deliverable | Timeline* |
|---|---|--|
| 1 | Inception Report | 1 week from the signing of the contract |
| 2 | Draft Environmental and Social Impact Assessment Report | 6 weeks from the signing of the contract |
| 3 | Final Environmental and Social Impact Assessment Report | 1 week after receiving comments on the Draft ESIA Report |

*From contract effective date

6. CONSULTANT'S TEAM AND QUALIFICATIONS

The Consultant's team shall be comprised of an Environmental Specialist and a Social Specialist. The qualifications and input of the Consultant's team are indicated in the table below.

| | Consultant | Qualifications | Input (workdays) |
|---|--------------------------|--|---------------------|
| 1 | Environmental Specialist | <ul style="list-style-type: none"> – Master’s (or above) in a field relevant to environment studies such as environmental science, environmental engineering, etc ... – At least 10 years of experience in environmental assessment, management, monitoring, and audit – Experience in preparation of Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plan (ESMP), Environmental and Social Monitoring Plan, Environmental Audit, and other related documents, preferably for large-scale development partner funded infrastructure projects – Knowledge on country legal and institutional framework – Work experience in/with World Bank funded projects and knowledge of the World Bank ESF provisions/requirements – Fluency in English, particularly in written and spoken English | 35 |
| 2 | Social Specialist | <ul style="list-style-type: none"> – Master’s (or above) in a field relevant to socio-economic studies such as sociology, social science/studies, anthropology, community development, gender studies, etc, – At least 10 years of experience in social assessment, management, monitoring, and audit – Experience in preparation of Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plan (ESMP), Environmental and Social Monitoring Plan, Social Audit, Resettlement Plan (RP), Stakeholder Engagement Plan (SEP), and other related documents, preferably for large-scale development partner funded infrastructure projects – Knowledge on country/ regional legal and institutional framework – Experience in conducting stakeholder engagement – Work experience in/with World Bank funded projects and knowledge of the World Bank ESF provisions/requirements | 35 |

| | | | |
|--|--|--|--|
| | | – Fluency in English, particularly in written and spoken English | |
|--|--|--|--|

7. CONSULTANT'S PROPOSAL

The Consultant's proposal for the Environmental and Social Impact Assessment (ESIA) should contain the sections (information) listed below and the proposal (i.e., main sections excluding appendices) should not exceed 15 pages.

Work Approach/Methodology - The scope of work should include a description of the specific activities that will be performed to accomplish the required tasks identified in this Terms of Reference. This should include any proposed site visits/surveys, documents to be reviewed, interviews, etc. If the Consultant feels that additional tasks or components within the scope of work are required or warranted, these should be stated and delineated as "Optional Tasks".

1. **Project Team and Qualifications** - This should include the name of the principal staff members (indicated above). Qualifications of staff should include relevant technical capabilities, previous relevant project experience, specific in-country and regional experience and knowledge, and specific language skills.
2. **Schedule** - A proposed schedule for performance of the ESIA must be presented with breakdown of specific tasks and activities. The schedule must indicate the proposed start and completion dates for each activity listed in the "Scope of Work and Expected Output" section of this Terms of Reference and any important or specific project milestones (e.g., report submittal, etc.).
3. **Estimated Costs** - A total cost of the consultancy service must be provided. Breakdown of the estimated costs by tasks/activities must also be presented (e.g., tabular format) and should include Direct Labor Costs (number of days per staff and their associated unit costs) and reimbursable expenses (e.g., travel, per diem, etc.). Any assumptions related to the estimated costs must be clearly stated. If any additional *Optional Tasks* are recommended, then a separate cost estimate must be provided.

8. CLIENT'S SUPPORT

The Client will support the Consultant in the following matters:

- Access to relevant technical study reports and other documents including the Project Appraisal Document (PAD), the Environmental and Social Management Framework (ESMF), and other available documents. These documents are currently at draft stage and will be shared with the Consultant when finalized.
- Support (whenever possible) the Consultant's field visit coordination and liaison with the concerned authorities in the project influence area to gather information relevant to the project.
- Support (whenever possible) the Consultant in coordinating stakeholders' consultations and liaison with some of the stakeholders.
- Support (whenever possible) the Consultant in logistics such as travel, meeting facilities, amenities, etc ...

9. ANNEX A : INDICATIVE OUTLINE FOR ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) REPORT

EXECUTIVE SUMMARY

1 INTRODUCTION

- 1.1 Project Background/Context
- 1.2. Rationale of the project
- 1.3. Objectives of the ESIA
- 1.4. Scope of the ESIA
- 1.5. Approach/Methodology of the ESIA
- 1.6. Structure of the ESIA

2 LEGAL AND INSTITUTIONAL FRAMEWORKS

- 2.1 Policies and Strategies
- 2.2 Legal Framework
- 2.3 International Conventions and Protocols
- 2.4 Regional Agreement and Cooperative Frameworks
- 2.5 World Bank Environmental and Social Framework (ESF)
- 2.6 Institutional Framework, Structure and Capacity

3 PROJECT DESCRIPTION

- 3.1 Project Development Objectives
- 3.2 Project Components and Subcomponents
- 3.3 The Project Beneficiaries
- 3.4 Project Implementation Arrangement
- 3.5 Project Environmental and Social Risk Ratings
- 3.6 Specific Infrastructure Investment/Subproject

4 ENVIRONMENTAL AND SOCIAL BASELINE CONDITIONS

- 4.1 Physical Conditions
- 4.2 Biological Conditions
- 4.3 Socio-economic Conditions

5 ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS

- 5.1 Beneficial/Positive Environmental and Social Risks and Impacts
- 5.2 Adverse/Negative Environmental and Social Risks and Impacts
 - 5.2.1 Environmental
 - 5.2.2 Occupational Health and Safety
 - 5.2.3 Community Health and Safety
 - 5.2.4 Social
 - 5.2.5 Ancillary Facilities

6 ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES

7 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLANS

7.1 Environmental and Social Management Plan (ESMP)

7.2 Environmental and Social Monitoring Plan

8 CAPACITY DEVELOPMENT AND TRAINING

9 ANALYSES OF ALTERNATIVES

10 STAKEHOLDERS CONSULTATIONS

11 CONCLUSIONS AND RECOMMENDATIONS

11.1 Conclusions

11.2 Recommendations

ANNEXURE

Annex 1 List of the Consultant's Team

Annex 2 References

Annex 3 Records of Stakeholders Consultations

Annex 4 Environmental and Social Clauses to be Included in Contract Documents

Annex 5 List of Associated Reports

ANNEX XII: TERMS OF REFERENCE (TOR) FOR PREPARATION OF AN ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

TABLE OF CONTENTS

| | | |
|------|---|---|
| 1. | <u>BACKGROUND</u> | 1 |
| 2. | <u>OBJECTIVES OF THE CONSULTANCY SERVICE</u> | 1 |
| 3. | <u>SCOPE OF WORK</u> | 2 |
| 3.1. | <u>GENERAL</u> | 2 |
| 3.2. | <u>INTRODUCTION</u> | 2 |
| 3.3. | <u>PROJECT DESCRIPTION</u> | 2 |
| 3.4. | <u>ENVIRONMENTAL & SOCIAL IMPACTS IDENTIFICATION & MITIGATION</u> | 3 |
| 3.5. | <u>MONITORING</u> | 4 |
| 3.6. | <u>CAPACITY DEVELOPMENT AND TRAINING</u> | 5 |
| 3.7. | <u>IMPLEMENTATION SCHEDULE AND COST ESTIMATE</u> | 5 |
| 3.8. | <u>INTEGRATION OF ESMP WITH THE PROJECT</u> | 5 |
| 4. | <u>DELIVERABLES</u> | 5 |
| 5. | <u>TIMELINE OF THE CONSULTANCY SERVICE</u> | 6 |
| 6. | <u>CONSULTANT'S TEAM AND QUALIFICATIONS</u> | 6 |

ANNEXURE

| | |
|--|---|
| ANNEX 1 Indicative Outline for Environmental & Social Management Plan (ESMP) | 8 |
| ANNEX 2 Indicative Template for Environmental & Social Management Plan | 9 |
| ANNEX 3 Indicative Template for Environmental & Social Monitoring Plan | 9 |

1. BACKGROUND

The government of South Sudan through the Ministry of Energy and Dams (MoED), South Sudan Electricity Corporation (SSEC), the Ministry of Financing and Planning (MoFP), and other implementing institutions is planning to implement the *South Sudan Energy Access Project*. The objective of the proposed project is to increase access to electricity services for households, refugee host communities, health and educational facilities and strengthen the institutional capacity of the energy sector in South Sudan with the support of World Bank. The project will provide additional 16,000 connections to the Juba power distribution system through densification of the existing grid, out of which 10,000 will be connected from 24 existing idle transformers. Also, network strengthening (intensification) will be undertaken for an additional 15,000

connections that will be extended to major IDP camps in Juba. The refugee host communities such as Pariang in Ruweng administrative area and the refugee camps, particularly, in Maban and/or Jamjang will get energy access from mini grid project. The off-grid electrification supports a total of 1,654 health facilities and 5,580 educational facilities to get electrification access.

The *South Sudan Energy Access Project* will contain four components, which are (1) Juba isolated grid extension/densification, (2) construction mini grid pilots in Jam Jang or Maban, (3) off-grid electrification through standalone solar systems and (4) technical assistance and capacity building. The lead responsibility for the overall coordination and implementation of the project lies on steering committee of MoED, SSEC and MoFP under which a Project Implementation Unit (PIU) will be established. The United Nations High Commissioner for Refugees (UNHCR) and public facilities are anchor customers and implementation partners on Component 2. The Component 3 will be implemented through a combination of public and private sector led approaches with a focus on efficient delivery channels to ensure long-term sustainability of installed systems.

The project infrastructure investments (subprojects) will have adverse environmental and social risks including (i) impacts on the biophysical environment, (ii) occupational health and safety impacts, (iii) community health and safety impacts, and (iv) social impacts. Thus, to avoid, minimize, mitigate, and offset potential adverse impacts and to enhance positive impacts of the project, different types of environmental and social instruments will be prepared, among which are Environmental and Social Management Plans (ESMPs).

2. OBJECTIVES OF THE CONSULTANCY SERVICE

The technical services of an independent environmental and social consultant (“Consultant”) is required to prepare an **Environmental and Social Management Plan (ESMP)** for the **South Sudan Energy Access Project Infrastructure Investment/Subproject** (“Project”). The main objectives of the consultancy service are:

1. To identify the environmental and social impacts due to project implementation and operation.
2. To analyze, evaluate, and recommend measures to avoid, minimize, mitigate, and compensate/offset potential environmental and social impacts of the project so that it complies with the national, international, and World Bank’s legislations, policies and frameworks.
3. To prepare environmental and social management and monitoring plans for implementation and operation phases of the project.

3. SCOPE OF WORK

3.1. GENERAL

In general, the Consultant will perform the following key tasks as part of the Environmental and Social Management Plan (ESMP) preparation of the *South Sudan Energy Access Project*:

1. Describe the *South Sudan Energy Access Project* infrastructure investment/subproject including its main components, ancillary components/facilities, resources input, and outputs/produces.

2. Identify project adverse environmental and social impacts and propose mitigation measures based on the mitigation hierarchy.
3. Develop an environmental and social monitoring plan based on the mitigation plan developed.
4. Assess the capacity of the implementing institution and recommend capacity development and training plan.
5. Prepare implementation schedule and cost estimate for the ESMP implementation.

The details of the various activities of the ESMP are described in the below sections.

3.2. INTRODUCTION

The following key aspects of the *South Sudan Energy Access Project* should be defined and described.

- The Project (the *South Sudan Energy Access Project*) background/context
- The specific project infrastructure investment/subproject background/context
- Rationale for the project infrastructure investment
- The objectives of the ESMP
- The scope of the ESMP
- Approach/methodology of the ESMP, and
- The structure of the ESMP report.

3.3. PROJECT DESCRIPTION

The *South Sudan Energy Access Project* infrastructure investment/subproject shall be described briefly including the following (but not limited to):

- The location of the infrastructure investment/subproject (geographic and administrative locations)
- Specific site location and key baseline conditions
- Accessibility of the site
- The project intervention design and its main components/features
- Construction materials used for construction of various components of the project including sources of the construction materials (market or own source)
- Machineries to be used during construction and operation of the project
- Energy consumption for the project
- Waste generated by the project
- Human resources requirements during implementation and operation phases
- Project implementation activities (during pre-construction, construction, and operation/maintenance stages)
- Project standard and regulatory requirements that should be maintained/satisfied
- Project implementation schedule.

3.4. ENVIRONMENTAL & SOCIAL IMPACTS IDENTIFICATION & MITIGATION

As part of the ESMP preparation, the project adverse risks and impacts shall be identified including (but not limited to) the following:

i. Environmental

- Air emissions/fugitive dust and ambient air quality impacts
- Impact on water quality
- Noise and vibration impacts
- Impacts of waste generation and disposal
- Polychlorinated biphenyls (PCBs) and SF6 impacts
- Impact of hazardous waste
- Impact due to non-hazardous waste
- Impact of loss of soil and land degradation
- Impact due to clearing of vegetation cover and disturbance of habitat
- Impact of biodiversity loss
- Bird strikes/collisions and electrocution
- Health effects of electromagnetic fields (EMF)
- Visual impacts

ii. Occupational health and safety

- Physical hazards including (i) rotating and moving equipment/machineries, (ii) noise and vibration, (iii) electrical hazard, (iv) eye hazards due to flying debris, (v) hazards from hot works, (vi) traffic accidents from the site traffic and offsite movements of project vehicles/trucks, (vii) work-at-height, (viii) excavation hazards, (ix) ergonomics, repetitive motion, manual handling, (x) working environment temperature and illumination, (x) poor housekeeping, slip, trip, fall
- Chemical hazards including (i) poor air quality, (ii) fire and explosions, (iii) hazardous chemical
- Biological hazards including (i) exposure to wastewater, (ii) transmittable diseases/infections
- Special hazard environments such as (i) confined space, (ii) lone and isolated worker

iii. Community health and safety

- Water quality and availability
- Structural safety of project interventions
- Fire risk
- Traffic risk

- Risk from hazardous materials/wastes during transport and disposal
- Transmittable disease and public health impact

iv. Social

- Social conflicts/dissatisfaction on services
- Conflict between local and migrant workers
- Labor influx
- Impact on child labor and young worker

v. Risks related to development and operation of ancillary facilities (if any).

The ESMP shall identify measures and actions in accordance with the mitigation hierarchy that reduce the potential adverse environmental and social impacts to acceptable levels. The plan will include compensatory measures, if applicable. Specifically, the ESMP shall:

- i. Identify and summarize all anticipated adverse environmental and social impacts (including those involving indigenous people or involuntary resettlement).
- ii. Describe, with technical details, each mitigation measure, including the type of impact to which it relates and the conditions under which it is required (e.g., continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate.
- iii. Estimates any potential environmental and social impacts of these measures.
- iv. Takes into account, and consistent with, other mitigation plans required for the project (e.g., for involuntary resettlement, indigenous peoples, or cultural heritage).

A management plan shall be developed to implement the ESMP. An indicative template for the environmental and social management plan is included in *Annex 2*.

3.5. MONITORING

The ESMP shall identify monitoring objectives and specifies the type of monitoring, with linkages to the impacts assessed in the environmental and social assessment and the mitigation measures described in the ESMP. Specifically, the monitoring section of the ESMP provides (a) a specific description, and technical details, of monitoring measures, including the parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions; and (b) monitoring and reporting procedures to (i) ensure early detection of conditions that necessitate particular mitigation measures, and (ii) furnish information on the progress and results of mitigation.

An indicative template for the E&S monitoring plan is included in *Annex 3*.

3.6. CAPACITY DEVELOPMENT AND TRAINING

To support timely and effective implementation of environmental and social project components and mitigation measures, the ESMP shall draw on the environmental and social assessment of the existence, role, and capability of responsible parties on site or at the agency and ministry level.

Specifically, the ESMP shall provide a specific description of institutional arrangements, identifying which party is responsible for carrying out the mitigation and monitoring measures (e.g., for operation, supervision, enforcement, monitoring of implementation, remedial action, financing, reporting, and staff training).

To strengthen environmental and social management capability in the agencies responsible for implementation, the ESMP shall recommend the establishment or expansion of the parties responsible, the training of staff and any additional measures that may be necessary to support implementation of mitigation measures and any other recommendations of the environmental and social assessment.

3.7. IMPLEMENTATION SCHEDULE AND COST ESTIMATE

For all three aspects (mitigation, monitoring, and capacity development), the ESMP shall provide (a) an implementation schedule for measures that must be carried out as part of the subproject, showing phasing and coordination with overall project implementation plans; and (b) the capital and recurrent cost estimates and sources of funds for implementing the ESMP. These figures shall also be integrated into the total project cost tables.

3.8. INTEGRATION OF ESMP WITH THE PROJECT

Each of the measures and actions in the ESMP to be implemented shall be clearly specified, including the individual mitigation and monitoring measures and actions and the institutional responsibilities relating to each, and the costs of doing so shall be integrated into the subproject's overall planning, design, budget, implementation, and operation.

4. DELIVERABLES

The documents to be prepared as output of the consultancy service are *Draft* and *Final Environmental and Social Management Plans (ESMP)*. Detailed description and contents of the reports are presented in the below sections. The deliverables shall be produced in English. The Consultant should prepare the draft and final versions of the ESMP to the desired and acceptable quality to avoid several iterations of the plan.

5. TIMELINE OF THE CONSULTANCY SERVICE

The table below summarizes the timeline of the consultancy service.

| | Deliverable | Timeline* |
|---|--|---|
| 1 | Draft Environmental and Social Management Plan | 4 weeks from the signing of the contract |
| 2 | Final Environmental and Social Management Plan | 1 week after receiving comments on the Draft ESMP |

*From contract effective date

6. CONSULTANT'S TEAM AND QUALIFICATIONS

The Consultant's team shall be comprised of an Environmental Specialist and a Social Specialist. The qualifications and input of the Consultant's team are indicated in the table below.

| | Consultant | Qualifications | Input (workdays) |
|---|--------------------------|--|------------------|
| 1 | Environmental Specialist | <ul style="list-style-type: none"> – Master's (or above) in a field relevant to environment studies such as environmental science, environmental engineering, etc ... – At least 10 years of experience in environmental assessment, management, monitoring, and audit – Experience in preparation of Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plan (ESMP), Environmental and Social Monitoring Plan, Environmental Audit, and other related documents, preferably for large-scale development partner funded infrastructure projects – Knowledge on country legal and institutional framework – Work experience in/with World Bank funded projects and knowledge of the World Bank ESF provisions/requirements – Fluency in English, particularly in written and spoken English | 25 |
| 2 | Social Specialist | <ul style="list-style-type: none"> – Master's (or above) in a field relevant to socio-economic studies such as sociology, social science/studies, anthropology, community development, gender studies, etc, – At least 10 years of experience in social assessment, management, monitoring, and audit | 25 |

| | | | |
|--|--|---|--|
| | | <ul style="list-style-type: none"> – Experience in preparation of Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plan (ESMP), Environmental and Social Monitoring Plan, Social Audit, Resettlement Plan (RP), Stakeholder Engagement Plan (SEP), and other related documents, preferably for large-scale development partner funded infrastructure projects – Knowledge on country/ regional legal and institutional framework – Experience in conducting stakeholder engagement – Work experience in/with World Bank funded projects and knowledge of the World Bank ESF provisions/requirements – Fluency in English, particularly in written and spoken English | |
|--|--|---|--|

ANNEX 1 Indicative Outline for Environmental & Social Management Plan (ESMP)

EXECUTIVE SUMMARY

INTRODUCTION

1. Project Background/Context

- 1.1. Rationale of the Project Infrastructure Investment
- 1.2. Objectives and Scope of the ESMP
- 1.3. Approach/Methodology of the ESMP
- 1.4. Structure of the ESMP

2. PROJECT DESCRIPTION

- 2.1. The Project Infrastructure Investment
- 2.2. Project Implementation Activities
- 2.3. Project Implementation Schedule

3. ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES

3.1 Beneficial/Positive Environmental and Social Impacts and Mitigation Measures

3.2 Adverse/Negative Environmental and Social Impacts and Mitigation Measures

3.2.1 Environmental

3.2.2 Occupational Health and Safety

3.2.3. Community Health and Safety

3.2.4. Social

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLANS

4.1 Environmental and Social Management Plan (ESMP)

4.2 Environmental and Social Monitoring Plan

5. CAPACITY DEVELOPMENT AND TRAINING

6. IMPLEMENTATION SCHEDULE AND COST ESTIMATES

6.1 Implementation Schedule

6.2 Mitigation and Monitoring Cost Estimates

6.3 INTEGRATION OF ESMP WITH THE PROJECT

ANNEX 2 Indicative Template for Environmental & Social Management Plan

| Project Phases | Project Activity | Potential Environmental / Social Impacts | Proposed Mitigation Measure(s) | Success Indicator(s) | Location of Mitigation Measure(s) | Frequency of Mitigation | Institutional Responsibility (i.e., enforcement and coordination) |
|---------------------------------|------------------|--|--------------------------------|----------------------|-----------------------------------|-------------------------|---|
| Pre-construction Phase | 1. 2. 3. | | | | | | |
| Construction Phase | 1. 2. 3. | | | | | | |
| Operation and Maintenance Phase | 1. 2. 3. | | | | | | |

ANNEX 3 Indicative Template for Environmental & Social Monitoring Plan

| Project Phases | Potential Environmental / Social Impacts | Proposed Mitigation Measure(s) | Parameters to be Monitored | Location | Measurements (incl. methods & equipment) | Frequency of Measurement | Responsibility (incl. a report) |
|---------------------------------|--|--------------------------------|----------------------------|----------|--|--------------------------|---------------------------------|
| Pre-construction Phase | 1. 2. 3. | | | | | | |
| Construction Phase | 1. 2. 3. | | | | | | |
| Operation and Maintenance Phase | 1. 2. 3. | | | | | | |