

ASCENT

**Accelerating Sustainable and Clean Energy
Access Transformation Program**

**Standard Environmental and Social Management
Plan (ESMP)**

**Template for the Construction of Battery Energy
Storage Systems (BESS)**

December 2025

INTRODUCTION TO THE ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) TEMPLATE

Background

This Environmental and Social Management Plan (ESMP) template has been created for the purpose of facilitating the assessment of environmental and social impact factors and the development of adequate mitigation strategies for prospective Battery Energy Storage Systems (BESS) sub-project developers and operators for new countries joining Accelerating Sustainable and Clean Energy Access Transformation (ASCENT) Multi Programmatic Approach (MPA). ASCENT is set to roll out across more than 20 countries over the coming three years. The initial phase will see implementation in Rwanda, Sao Tome and Principe, Somalia, and Tanzania. The second phase will expand to Kenya, Malawi, Namibia, Burundi, Zambia, Mozambique, and Ethiopia. The final phase will bring ASCENT to Comoros, Lesotho, Uganda, the Democratic Republic of the Congo (DRC), South Sudan, Angola, Madagascar, and Botswana.

ASCENT MPA will finance a wide array of activities and works that include Battery Energy Storage Systems (BESS), hydro/solar-based mini-grids, small length of transmission lines (132kV) involving towers, distribution lines, Construction of distribution and grid substations, installation service drop cables and meters, Solar Home Systems (SHS), and improved cookstoves. Given that the specific activities and works to be carried out in each country joining ASCENT have not yet been identified, a framework approach is proposed to address potentially negative environmental and social impacts and risks and this ESMP Template provides “pragmatic good practice” standardized approach which should be tailored by each joining Country as part of their ASCENT Battery Energy Storage Systems (BESS) Subprojects preparation and is designed to be user friendly and compatible with WB ESF requirements. The template format attempts to provide a simplified and uniform approach to preparation of the required ESMPs by the additional Countries joining ASCENT Program. The approval of ESMPs by the applicable respective regulatory authorities are a prerequisite to proceed with the construction of mini-grid projects.

It is worth noting that the scope of environmental and social mitigation strategies that National Environmental Agencies will demand from prospective project proponents are directly dependent on the regulatory, geographic and demographic context where the future project is to be implemented. Maximum and minimum threshold limits of, for instance, pollution levels, are not homogeneous across participating countries and thus each Proponent must be familiar with the regulatory context where the project is to be implemented. Nevertheless, BESS *per se*, regardless of where they are located, imply a similar set of environmental and social risks, thus enabling the development of this standardized ESMP template.

Instructions:

This template provides guidance for the preparation and implementation of Environmental and Social Management Plans. The prospective Project proponent is expected to become familiar with the National Regulatory Framework and integrate those parameters of relevance to the template.

For each missing field, kindly fill in the blank space according to the associated instruction (as specified in brackets). In some cases, this implies the name of an institution; in others, it implies the maximum/minimum permitted thresholds as per National Regulations.

[COUNTRY NAME]

[NAME OF MINISTRY/IMPLEMENTING AGENCY]

[LOGO OF MINISTRY]

[NAME OF PROJECT]

[PROJECT CODE]

**ENVIRONMENTAL AND SOCIAL MANAGEMENT
PLAN
(ESMP)
for the Construction of Battery Energy Storage Systems
(BESS)**

[BORROWER APPROVAL AND DISCLOSURE DATE]

Table of Contents

<i>Table of Contents</i>	<i>iv</i>
<i>List of Tables</i>	<i>v</i>
<i>Abbreviations and Acronyms</i>	<i>vi</i>
1. Context	1
2. Project Objectives and Scope of Works:.....	1
3. ESMP Objectives.....	4
4. Legal And Regulatory Framework.....	5
5. Environmental and Social Baseline	13
6. ASSESSMENT OF POTENTIAL IMPACTS AND MITIGATION MEASURES	13
<i>6.1 Potential Environmental and Social Impacts with Corresponding Mitigation Measures ..</i>	<i>13</i>
7. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN	17
8. CONSULTATIONS AND PUBLIC PARTICIPATION.....	30
<i>8.1 Objectives of The Stakeholder Consultations</i>	<i>30</i>
<i>8.2 Summary of Issues During the Stakeholder Consultations</i>	<i>30</i>
9. IMPLEMENTATION AND MONITORING ARRANGEMENTS FOR THIS ESMP....	30
<i>9.1 Implementation Arrangements, Roles and Responsibilities.....</i>	<i>30</i>
<i>9.2 Institutional Training and Sensitization.....</i>	<i>32</i>
<i>9.3 Monitoring of the ESMP</i>	<i>33</i>
<i>11.4 Reporting.....</i>	<i>38</i>
<i>11.5 Environmental and Social Auditing</i>	<i>38</i>
<i>11.6 ESMP Implementation Budget</i>	<i>Error! Bookmark not defined.</i>
10. REFERENCES.....	39

List of Tables

[Include a numbered list of the titles of the tables included in the ESMP].

Abbreviations and Acronyms

[Include an alphabetized list of all the abbreviations and acronyms used in the document].

Acronym	Acronym in Full
AC	Alternating current
AFD	Agence Francaise de Développement
AfDB	African Development Bank
AFE	Eastern and Southern Africa
ASCENT	Accelerating Sustainable and Clean energy Access Transformation
AIIB	Asian Infrastructure Investment Bank
BESS	Battery Energy Storage Systems
CdTe	Cadmium Telluride
C-ESMP	Contractor Environmental and Social Management Plan
CFL	Compact Fluorescent Lamp
CHS	Community Health and Safety
CoC	Code of Conduct
COMESA	Common Market for Eastern and Southern Africa
dB	Decibels
DC	Direct current
DRE	Distributed Renewable Energy
E&S	Environmental and Social
EHSs	Environmental, Health and Safety Guidelines
EMF	Electric and Magnetic Fields
ESCP	Environmental and Social Commitment Plan
ESF	Environmental and Social Framework
ESIA	Environmental and Social Impact Assessment
ESIRT	Environmental and Social Incident Reporting Toolkit
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
ESSs	Environmental and Social Standards
FI	Financial Intermediary
GBV	Gender-based Violence
GBVAP	Gender-based Violence Action Plan
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
GRS	Grievance Redress Service
HWMP	Hazardous Waste Management Plan
IDA	International Development Association
IFC	International Finance Corporation
IP/SSAHULTC	Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities
LMP	Labour Management Procedures
LV	Low Voltage
MPA	Multi Programmatic Approach

MV	Medium Voltage
OHS	Occupational Health and Safety
PAD	Project Appraisal Document
PAP	Project Affected Person
PCR	Physical Cultural Resources
PIU	Project Implementation Unit
PPE	Personal Protective Equipment
PPP	Public Private Partnership
PUE	Productive Use of Energy
RAP	Resettlement Action Plan
RoW	Right of Way
RPF	Resettlement Policy Framework
SEA/SH	Sexual Exploitation and Abuse/ Sexual Harassment
SEP	Stakeholder Engagement Plan
SHS	Solar Home Systems (SHS)
SMP	Security Management Plan
SPV	Solar Photovoltaic
ToR	Terms of Reference
VAC	Violence Against Children
VRE	Variable Renewable Energy
WB	World Bank
WBG	World Bank Group
WHO	World Health Organization

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

FOR ASCENT ROLLOUT TO NEW COUNTRIES

1. Context

The Accelerating Sustainable and Clean Energy Access Transformation (ASCENT) Multi Programmatic Approach (MPA) aims to accelerate access to sustainable and clean energy in Eastern and Southern Africa (AFE). The project will establish an ASCENT Regional Acceleration Platform, managed by the Common Market for Eastern and Southern Africa (COMESA), which will drive implementation of Pillar 1 from the regional level, supported by additional actions and activities in participating countries. The Acceleration Platform will support both Phase 1 countries (for implementation of their projects), and to assist those countries still to enter the Multi Programmatic Approach (MPA) to prepare. In addition, the Platform will provide support to Distributed Renewable Energy (DRE) and clean cooking companies active in the region to accelerate their efforts and mobilize capital. Specifically, the Acceleration Platform will (i) support AFE countries in their adoption of digital platforms and tools facilitating management, financing, verification and monitoring of their energy access efforts, (ii) enact a digital monitoring, reporting and verification (D-MRV) platform at the regional level allowing aggregation from countries and the private sector and enabling the generation of carbon revenues and/or other climate/impact-related result-based financing; (iii) establish a Project Preparation Facility providing market intelligence and technical assistance both to Government agencies and the private sector, including for identification and enabling of cross-border electrification solutions; (iv) support planning processes and adoption of best practices and harmonization of policy and regulatory frameworks; (v) deliver energy access data and statistics, facilitating knowledge exchange and driving skill development, and (vi) provide support for monitoring and evaluation of the overall ASCENT program.

2. Project Objectives and Scope of Works:

[Project description, including identification of components and activities, from PCN, PAD, Energy Master Plan or elsewhere, concisely describes the proposed subproject and its geographic location, environmental, social, and temporal context, including any offsite investments that may be required, e.g. access roads, equipment yard, etc. Insert information on the names of locations of the BESS, their respective maps, voltage, number of kilometers, the engineering design, and site lay-out plans, expected activities and works, expected duration of works, if known supporting facilities, and any salient physical characteristics of the project site/s, including information on any Associated Facilities as well as other projects that could lead to cumulative impacts.]

The objective of the ASCENT MPA in [insert name of formal sovereign borrower name] is [Project Development Objective, from Project Concept Note (PCN), Project Appraisal Document (PAD),

or other available documentation]. Also, add project justification [in line with Project Concept Note].

Battery Energy Storage Systems (BESS) are advanced technologies that store electrical energy for later use, enhancing the reliability and efficiency of energy systems, particularly in conjunction with renewable energy sources. Battery Energy Storage Systems (BESS) capture and store energy from various sources, primarily renewable ones like solar and wind, in rechargeable batteries. This stored energy can be utilized during peak demand periods or when renewable sources are inactive, such as at night or during cloudy weather. BESS plays a crucial role in stabilizing the grid and ensuring a consistent power supply. BESS operates by converting and storing electricity during off-peak times when energy is cheaper and more abundant. The system typically includes the following components assembled inside containers:

- **Batteries:** The core component where energy is stored.
- **Inverters:** Convert direct current (DC) from the batteries into alternating current (AC) for use in homes and businesses.
- **Battery Management System (BMS):** A system that Monitors and manages the charge levels, health and safety of the batteries.

How Energy Storage Works

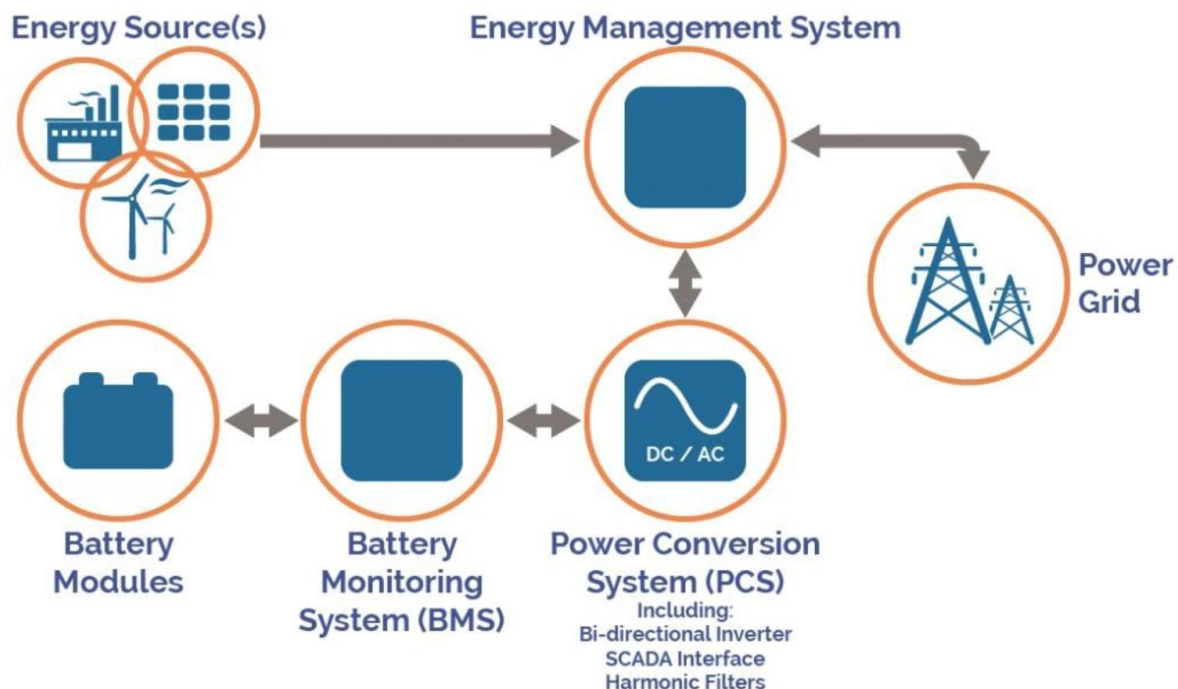


Figure 1: Graphic Presentation of how Battery Energy Storage System Works

The structure of a BESS plant is conceptually quite simple, with a small number of basic components:

- **Batteries:** these are the basic units that make up a BESS. They are the cells where, through electrochemical reactions, the charging and discharging of electricity takes place. The cells are assembled into modules; the modules in turn are joined together to form larger components, called racks; a group of racks is called a container.
- **The container** is typically about 6 meters in length, 2.5 meters in width, and 3 meters in height. It is the fundamental element in a BESS.
- **The inverter** is the instrument used for transforming the *alternating* current (AC) supplied by the grid into the *direct current* (DC) used in order to charge the batteries, and vice versa to convert the direct current from the batteries back into the suitable alternating current for the grid in the discharge phase. Each inverter is connected to one or more containers.
- **Auxiliary systems** are used for cooling, control and safety of the system.
- **The transformer** is used in order to raise the voltage before switching to the substation.
- **Campsite** will be required to house the workers and the equipment, and this usually does not require a lot of land.

A group of containers, equipped with a (single) transformer and auxiliary systems, is called an **island**. An island is therefore technically a self-sufficient BESS plant, although plants often consist of several islands. All islands are then connected to a single **substation** where the voltage is further raised to the high voltage of the grid.

The Scope of the BESS Sub-Projects is NOT expected to cover components relating to establishing Substation/s, Distribution Line/s, and Energy Source, since these are expected to be already in place and/or undertaken separately from BESS. The qualification of Associated Facilities will therefore not apply to BESS investments, since they will not be implemented contemporaneously.

The proposed Battery Energy Storage System (BESS) [provide name of subproject, key components for installation, proposed voltage] is/are located [provide name of location and GPS coordinates]. [include map showing location of the BESS, and layout plan, where applicable e.g. associated substation].

The project entails a series of activities which include among others, the following: *[edit and add as appropriate, following the different project development phases suggested below]*

A. Design and Planning Stage

- Acquiring and securing BESS installation site/ land
- Planning, Surveying and design of the BESS.

-
-

B. Construction Stage

- Opening and clearing of the construction site, with digging for the laying of the foundations for the placement of the BESS.
- Transportation of the BESS containers, equipment and construction materials and the cranes to move them.
- Installation of the containers and then the wiring of the inverters, the implementation of the safety devices and the substation.
- Connection of BESS to electrical grid.
- Pre-commissioning tests and commission.

Construction activities are anticipated to last for [provide estimated construction period] Months.

C. Operation Phase

- Routine maintenance activities including Transportation of electrical poles, Storage of equipment, and construction materials.
- Transportation of the BESS containers, equipment and construction materials and the cranes to move them.
- Installation of the containers and then the wiring of the inverters, the implementation of the safety devices and the substation.
-
-

D. Decommissioning/ Rehabilitation Phase

- Removal of installed electrical materials such as containers, the wiring, inverters, safety devices and the substation.
- Disposal of decommissioned materials listed above and associated construction debris/ waste.
-
-

3. ESMP Objectives

The objectives of this ESMP are to identify the environmental and social impacts associated with the proposed BESS project/s and to proffer appropriate mitigation

measures to ensure compliance with relevant environmental and social policies of the Government of [insert formal sovereign borrower name] and the World Bank ESF.

4. Legal And Regulatory Framework

Carry out the assessment taking into account the applicable national legislation, covering, among other aspects:

- Environmental impact assessment regulations.
- Waste management.
- Health and safety at work.

Given the funding source for the Project, the World Bank's Environmental and Social Framework (ESF) and the relevant Environmental, Health and Safety Guidelines (EHSGs), namely the General EHSGs should be considered.

The ESF contains an import set of requirements, structured in Environmental and Social Standards, covering aspects like:

- Assessment and Management of Environmental and Social Risks and Impacts.
- Labor and Labor Conditions.
- Resource Efficiency, Pollution Prevention and Management.
- Community Health and Safety.
- Land Acquisition, Land Use Restrictions, and Involuntary Resettlement.
- Biodiversity Conservation and Sustainable Management of Living Natural Resources.
- Cultural Heritage.
- Stakeholder Engagement and Information Dissemination.

[Insert a list of key relevant regulations and guidelines on assessing and managing impacts of installation of BESS. Keep descriptions of laws and regulations brief and only describe elements applicable to subproject activities.]

Table 1: ESS Objectives and Relevance to the Project.

Environment and Social Standards	Objectives	Relevance to Project
ESS1: Assessment and Management of Environmental and Social Risks and Impacts;	To identify, evaluate and manage the environment and social risks and impacts of the project in a manner consistent with the ESSs To adopt differentiated measures so that adverse impacts do not fall disproportionately on the disadvantaged or vulnerable, and they are not disadvantaged in sharing development benefits and opportunities resulting from the project. To utilize national environmental and social institutions, systems, laws, regulations and procedures in the assessment, development and implementation of projects, whenever appropriate. To promote improved environmental and social performance, in ways which recognize and enhance Borrower capacity.	ESS1 is relevant for the project because project activities are expected to pose low-moderate environmental and social risks. Environmental impacts arise throughout the lifecycle of battery storage systems, from raw material extraction to end-of-life disposal. Key issues include resource depletion, greenhouse gas emissions, and pollution from mining activities. Sustainable practices such as responsible sourcing of materials, recycling initiatives, and the development of second-life applications are essential for minimizing environmental footprints.
ESS 2: Labor and Working Conditions	To promote safety and health at work. To promote the fair treatment, non-discrimination and equal opportunity of project workers. To protect project workers, including vulnerable workers such as women, persons with disabilities, children (of working age, in accordance with this ESS) and migrant workers, contracted	The installation of the BESS is likely to engage direct and contracted project workers, who could be exposed to different types of OHS risks from project activities. The number of project workers is estimated to be XX [insert the estimated number of workers involved in the installation and operation of the BESS]. The following OHS risks are anticipated, among others: Live power lines, Working at height, Electric and magnetic fields, Exposure to chemicals [please add as appropriate]

	workers, community workers and primary supply workers, as appropriate. To prevent the use of all forms of forced labor and child labor. To support the principles of freedom of association and collective bargaining of project workers in a manner consistent with national law. To provide project workers with accessible means to raise workplace concerns	
ESS3 - Resource Efficiency and Pollution Prevention and Management	To promote the sustainable use of resources, including energy, water and raw materials. To avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities. To avoid or minimize project-related emissions of short and long-lived climate pollutants. To avoid or minimize generation of hazardous and non-hazardous waste. To minimize and manage the risks and impacts associated with pesticide use.	This standard is relevant because construction activities can generate varying levels of pollution including disposal of hazardous and non- hazardous wastes and pollution to air, water, etc. During Project construction, the project solid waste generated will mainly consist of used and scrap metals (cables and steel scraps), plastics from packing in equipment, wooden pallets, cardboard boxes etc. BESS pose environmental considerations throughout their life cycle. At the end of their life, BESS face challenges like low recycling rates and the risk of harmful substances release during improper disposal.
ESS 4: Community Health and Safety	To anticipate and avoid adverse impacts on the health and safety of project-affected communities during the project life cycle from both routine and non-routine circumstances.	During construction, community health and safety issues and risks include noise vibration, dust, road safety due to increased construction trucks on the roads, potential traffic accidents during equipment's and poles transportation to the site, increased construction trucks in the area, improperly

	To promote quality and safety, and considerations relating to climate change, in the design and construction of infrastructure, including dams. To avoid or minimize community exposure to project-related traffic and road safety risks, diseases and hazardous materials. To have in place effective measures to address emergency events. To ensure that the safeguarding of personnel and property is carried out in a manner that avoids or minimizes risks to the project-affected communities.	placed or stored materials, unprotected work sites and potential electrical faults from electrical lines. Waste left on site can also be a health and safety hazard to the communities. The influx of workers, goods, and services to a project area can have negative social consequences for the local community. Risks can be minimized by restricting access to the construction sites, having proper signage, creating community awareness on the risks and developing other appropriate mitigation measures based on additional identified risks. Further safety concerns of BESS encompass a range of factors, including thermal runaway, fire hazards, and chemical leakage, which pose risks to both human life and property. Mitigation strategies such as advanced battery management systems and fire suppression technologies are critical for addressing these risks effectively.
ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	To avoid involuntary resettlement or, when unavoidable, minimize involuntary resettlement by exploring project design alternatives. To avoid forced eviction. To mitigate unavoidable adverse social and economic impacts from land acquisition or restrictions on land use by: (a) providing timely (prior to displacement) in full compensation for loss of assets at replacement cost and (b) assisting displaced persons in their efforts to improve, or at least restore, their livelihoods and living standards, in real	The installation of BESS has a limited footprint but may cause the partial loss or modifications of assets or land take. The sites selected for the installation of the BESS will be screened to minimize any form of involuntary resettlement. In case of loss or modification of land or assets within the BESS sites, please refer to the RPF on preparation and implementation of either a RAP or LRP.

	terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher. To 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. To conceive and execute resettlement activities as sustainable development programs, providing sufficient investment resources to enable displaced persons to benefit directly from the project, as the nature of the project may warrant. To ensure that resettlement activities are planned and implemented with appropriate disclosure of information, meaningful consultation, and the informed participation of those affected.	
ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	To protect and conserve biodiversity and habitats. To apply the mitigation hierarchy and the precautionary approach in the design and implementation of projects that could have an impact on biodiversity. To promote the sustainable management of living natural resources. To support livelihoods of local communities, including Indigenous Peoples, and inclusive economic development, through the adoption of	[Analyze if the BESS installation will impact non-critical natural habitats. The following text can be adapted if the works impact non-critical habitats. If this is not the case, the standard can be considered non-relevant]. Works may affect modified and natural habitats such as forests and wetlands albeit such areas should be avoided as much as possible since the installation of BESS has a limited footprint, including avoiding clearing in riparian areas and avoiding use of machinery in the vicinity of water courses. Where avoidance is not possible, ESS6 guides impact management.

	practices that integrate conservation needs and development priorities.	
ESS 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	To ensure that the development process fosters full respect for the human rights, dignity, aspirations, identity, culture, and natural resource based livelihoods of Indigenous Peoples/ Sub-Saharan African Historically Underserved Traditional Local Communities. To avoid adverse impacts of projects on Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities, or when avoidance is not possible, to minimize, mitigate and/or compensate for such impacts. To promote sustainable development benefits and opportunities for Indigenous Peoples/sub-Saharan African Historically Underserved Traditional Local Communities in a manner that is accessible, culturally appropriate and inclusive. To improve project design and promote local support by establishing and maintaining an ongoing relationship based on meaningful consultation with the Indigenous Peoples/sub-Saharan African Historically Underserved Traditional Local Communities affected by a project throughout the project's life cycle. To obtain the Free, Prior, and Informed Consent (FPIC) of affected Indigenous	[Analyze if the path of the BESS site and related infrastructure will impact indigenous peoples. If so, the following text can be adapted. If this is not the case, the standard can be considered non-relevant]. This standard is relevant if the BESS and related infrastructure may impact indigenous communities. Where applicable, these activities will be guided by an IPP to be developed during implementation [following the guidance of the IPPF]. The IPP will include measures to mitigate any potential project impacts on IPs. The project SEP ensures that Indigenous communities are appropriately informed in an inclusive and culturally appropriate manner.

	Peoples/ Sub-Saharan African Historically Underserved Traditional Local Communities in the three circumstances described in this ESS. To recognize, respect and preserve the culture, knowledge, and practices of Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities, 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	To protect cultural heritage from the adverse impacts of project activities and support its preservation. To address cultural heritage as an integral aspect of sustainable development. To promote meaningful consultation with stakeholders regarding cultural heritage. To promote the equitable sharing of benefits from the use of cultural heritage.	This standard is considered relevant because of construction and excavation related activities which may encounter chance finds. A Chance Finds Procedure prepared as part of the Project ESMF will be used. [Investigation must be undertaken to determine whether there is some basis for the possible presence of tangible or intangible cultural heritage, with specific reference to the sub-project under consideration]. Sub-project screening excluded activities that could directly impact cultural heritage.
ESS 10: Stakeholder Engagement and Information Disclosure.	To establish a systematic approach to stakeholder engagement that will help Borrowers identify stakeholders and build and maintain a constructive relationship with them, in particular project-affected parties. To assess the level of stakeholder interest and support for the project and to enable stakeholders' views to be taken into	This standard applies to all projects funded by the Bank. A Stakeholder Engagement Plan (SEP) was developed, disclosed, and consulted on. The SEP identified and mapped the relevant stakeholders including beneficiaries and project affected people, and discussed the actions and consultation plans for each group. In addition, the SEP established a complaints and grievance redress mechanism (GRM) for stakeholders. The GRM included SEA/SH-sensitive measures, including multiple channels to initiate a

	account in project design and environmental and social performance. To promote and provide means for effective and inclusive engagement with project- affected parties throughout the project life cycle on issues that could potentially affect them. To ensure that appropriate project information on environmental and social risks and impacts is disclosed to stakeholders in a timely, understandable, accessible and appropriate manner and format. To provide project-affected parties with accessible and inclusive means to raise issues and grievances, and allow Borrowers to respond to and manage such grievances	complaint and specific procedures for SEA/SH, such as confidential and/or anonymous reporting with safe and ethical documenting of SEA/SH, and ensures that all project-level complaints are received and resolved in a timely manner.
--	--	---

The World Bank Environmental and Social Standards including guidance notes can be accessed through the following link:
<https://www.worldbank.org/en/projects-operations/environmental-and-social-framework>

5. Environmental and Social Baseline

This section highlights observed findings of the BESS installation and associated infrastructure sites during environmental and social assessment visits.

[Develop sub-sections describing the project location, land use/economic activities, vegetation/fauna, wetlands & river crossings, settlement patterns, and access to energy provider facilities. This should be done for individual BESS or preferably for groups of similar sites with an explanation of the grouping carried out].

[Insert pictures of the installation site to illustrate settlement patterns, encroachment, wetlands and river crossings, vegetation, and any salient characteristics that could impact the infrastructure].

[The baseline should focus on the project footprint and surrounds. District and national data should not be included.]

6. ASSESSMENT OF POTENTIAL IMPACTS AND MITIGATION MEASURES

6.1 Potential negative Environmental and Social Impacts

Typical steps in the construction of a BESS plant

As with all types of plant, the first phase concerns the permitting process. In the case of BESS, it's quite streamlined because they are containers that take up little space, involve no emissions and have no substantial environmental impact.

Once the administrative formalities have been completed, the suitability of the land needs to be checked; again, the procedure is simpler than that required for large-scale plants, or for those with a more complex configuration.

This is followed by the opening of the construction site, with digging for the laying of the foundations, the arrival of the containers and the cranes to move them. This is followed by the installation of the containers and then the wiring of the inverters, the implementation of the safety devices and the substation. Finally, the connection to the grid is made: at that point all that is missing is the official opening of the plant and its entry into operation.

6.1.1 Potential Negative Impacts

Negative impacts of construction and operation of BESS are described with corresponding mitigation measures. *[The content of each session is not exhaustive. Please correct or add*

information on the different kinds of impacts].

6.3.2.1 Negative Impacts on the Physical Environment

This section discusses the most significant potential impacts to environmental resources including soils, and water resources.. Generally, potential environmental impacts are expected to occur during the construction phase of the project although some impacts may also be associated with operations.

a: Negative Impacts on Soils

Soil disturbance during installation of the BESS may result in or contribute to soil erosion, particularly in areas prone to wind or water erosion. Soil disturbing activities may increase risks of erosion particularly in regions where the prevailing soil types have high erosion potential. Soil may be accidentally or intentionally become contaminated by the improper management of waste and other materials during project construction. Waste generated by construction activities will comprise primarily general solid waste including food waste, plastics, paper, cardboard and construction waste. Liquid waste will include black water and grey water generated on-site by construction workers.

b: Generation of waste

Installation of BESS may result in generation of waste arising from site clearance and operations, packaging materials, residual materials, etc. Generated wastes may range from plastic, metal, glass, paper, used oil and filters from vehicles, transformer oil, etc.

c: Hazardous Materials Management

End-of-life disposal presents significant challenges due to the complex composition of batteries and solar cells, coupled with limited recycling infrastructure. The recycling of battery materials requires specialized processes to recover valuable metals and minimize waste generation, but these technologies are not widely available or cost-effective in most developing countries. Improper disposal of batteries can lead to leaching of heavy metals, electrolytes, with resultant release of hazardous materials into the environment, posing risks to soil, water, and wildlife.

6.3.2.2 Negative Impacts on the Biological Environment

a: Negative Impacts on Forests and Water sources

While the footprint of BESS installations is limited, the site selected could impact ecologically sensitive areas and require the cutting of trees and vegetation. The operation of battery storage systems may have indirect impacts on surrounding ecosystems, particularly in sensitive habitats or protected areas. Infrastructure development, land use changes, and disturbance of natural landscapes can disrupt ecosystems, fragment habitats, and threaten biodiversity.

6.3.2.3 Occupational and Community Health and Safety

a: Negative Impacts on Community Health and Safety

During the installation of BESS the public is at risk of accidents from the equipment, vehicles, improperly placed or stored materials, and unprotected work sites. Since heavy-duty equipment and vehicles may have to work and traverse the road during construction, the safety of other road users could be jeopardized. Waste left on site can also be a health and safety hazard to the communities.

The footprint of BESS sites is small and temporary, and labour requires are equally limited and will therefore pose limited negative social consequences for the local community. Nevertheless there is an increased risk of SEA/SH, tensions between external workers and the community. As such, the project will institute a strict Code of Conduct for its small work force to mitigate any likely SEA/SH related impacts.

b: Occupational Health and Safety

Health and safety are key concerns at any construction site. Workers are usually exposed to situations which can result in serious accidents, some of which can be fatal, if established guidelines and practices are not properly communicated or complied with by workers and supervised/enforced accordingly. Risks can result from the improper use of construction methods, machines and equipment or accidents on the work sites. The health and safety of workers are therefore major concerns during the construction period. While training and monitoring should be conducted and can reduce the risk of any serious incidents, accidents can still occur. Risks may include accidents during site preparations, transporting and offloading of construction materials, improper use of equipment, slip or trip while traversing the work sites, etc. In such cases, these exposures can result in physical injuries such as cuts, bruises, loss of limbs or can even be fatal.

BESS safety concerns encompass a range of factors, including thermal runaway, fire hazards, and chemical leakage, which pose risks to both human life and property. Thermal runaway refers to a chain reaction within a battery cell, typically lithium-ion batteries, characterized by uncontrollable heat generation, which can lead to catastrophic consequences such as fire or explosion. Several factors contribute to thermal runaway, including overcharging, manufacturing defects, physical damage, and exposure to high temperatures.

Certain types of batteries, particularly lead-acid batteries, are prone to chemical leakage, which can occur due to damage, corrosion, or improper handling. Chemical leakage poses significant risks to both human health and the environment, as it can lead to the release of toxic substances such as sulfuric acid and heavy metals into the surrounding soil, water, and air. Exposure to these

hazardous materials can cause respiratory problems, skin irritation, and long-term health issues in humans, while also contributing to environmental pollution and ecosystem degradation.

The following are therefore possible health and safety risks which are likely to be encountered at the construction site:

- Live power lines.
- Exposure to chemicals.
- Injuries or death from vehicular collisions.
- Injuries from slips, trips and falls.
- Injuries from falling onto unprotected excavations and other open trenches or areas.
- Ill health caused by insect bites/stings from hostile fauna.
- Injuries or death caused by snake bites.
- Injuries or ill health caused by heat-related illnesses such as sunburn, heat stress, heat exhaustion or heat stroke as a result of working under extremely hot conditions.

6.3.2.4 Negative Impacts on the Socio-economic Environment

a: Inadequate stakeholder engagement and exclusion of vulnerable groups

In cases of inadequate stakeholder engagement, vulnerable groups can be underrepresented or excluded in project related engagements and planning, Women, people living with disabilities, the elderly etc may not be involved in decision making if differentiated engagement (focus groups) and timing of engagement is not considered When employed, women may be offered lower compensation than their male counterparts.

b: Land Acquisition, Land Use and Livelihoods

The sites selected for the installation of the BESS will be screened to avoid or minimize any form of involuntary resettlement.

[Identify impacts of land acquisition, land use, and economic resettlement based on the nature of works, including any potential voluntary land donation].

Mitigation measures

Prepare proportionate Resettlement Action Plan (RAP) or Livelihoods Restoration Plan (LRP) to guide the compensation process. If Voluntary Land Donation is being proposed ensure that the steps being followed are in line with ESS5.

d. Indigenous peoples

[If relevant, include an analysis of potential impacts of the installation of BESS to indigenous peoples and associated mitigation.]

7. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

The identified critical impacts of BESS installation and proposed mitigation measures under Section 6 above are extracted into Table 3 for ease of implementation. Please complete Section 6.2 and adapt it to your BESS subproject, as appropriate, and accordingly complete the Mitigation Tables Template provided below.

Table 3: Environmental and Social Risks and Mitigation Measures

Activities	Potential E&S Risks and Impacts	Proposed Mitigation Measures	Responsibilities	Timeline
Installation of BESS - <i>Impacts on Physical Environment.</i>	- <u>Impacts on Soil</u>	- All excess materials and waste produced during installation of BESS or maintenance must be collected for proper disposal and this must be included in contracts.	[Select an appropriate monitoring entity. i.e. supervision firm, PIU, public utility company, Contractor, etc]	Prior to, and during installation of BESS infrastructure
	- <u>Visual intrusion</u>	- Old or disused equipment must be safely decommissioned and cleared up following GIIP. - Accurate assessment of changes in property values due to BESS proximity. - Siting BESS with due consideration to landscape views and important environmental and community features.		

Activities	Potential E&S Risks and Impacts	Proposed Mitigation Measures	Responsibilities	Timeline
		- Location of BESS in less populated areas, where possible.		
	- <u>Waste Management</u> - <u>[Please consider providing information on offsite facilities that manage the various kinds of waste (hazardous and non-hazardous) that will be generated during all sub-project phases. This should include the entire life cycle of offsite waste management, from transport from the site to</u>	- Follow the mitigation hierarchy by avoiding generation of waste through product substitution, minimizing generation of waste by buying just enough materials to be used and ensuring efficiency. - All waste generated should be segregated and disposing it off according to waste types and characteristics to an approved landfill by a licensed vendor in line with national requirements. - Collect and transfer recyclable waste to recycling facilities. This includes metal, paper, plastic, wood. - Engage registered waste management companies to handle hazardous waste. - Organic waste shall be disposed of at the municipal landfill of the project area.	[Select an appropriate monitoring entity. i.e. supervision firm, PIU, public utility company, Contractor, etc]	Prior to, and during installation of BESS infrastructure

Activities	Potential E&S Risks and Impacts	Proposed Mitigation Measures	Responsibilities	Timeline
	<u>recycling facilities or to certified landfills. If such facilities do not exist within economical distance from the various sites of the BESS facility, environmentally sound alternative waste management must be proposed].</u>	- Require Contractors to develop and implement a waste management plan to manage different waste streams (Plastics, hazardous, Bio-degradable and non-biodegradable) in accordance with The National Environment/Waste Management Regulations. - The contractor to develop a hazardous waste tracking and documentation system/mechanisms to ensure that the hazardous waste is disposed by a licensed vendor to an approved facility/landfill per the national laws. - Workers should be trained and sensitized on waste management to ensure good housekeeping practices and general waste handling. (In particular hazardous waste handling and management). - Provide workers with appropriate PPE for handling the various		

Activities	Potential E&S Risks and Impacts	Proposed Mitigation Measures	Responsibilities	Timeline
		waste streams generated by the subproject.		
	- <u>Hazardous Materials Management</u>	- Undertake responsible sourcing of materials, ecosystem-friendly operation, and effective recycling and waste management - Adopt ethical supply chain practices through the procurement process for batteries and solar panel, engaging with suppliers to trace the origin of materials and address social and environmental risks throughout the supply chain. - Establishing closed-loop systems for battery collection, recycling, remanufacturing and end-of-life disposal. - Hazard communication and training programs to prepare workers to recognize and respond to workplace chemical hazards. Programs should include aspects of hazard identification, safe operating and materials handling procedures,	[Select an appropriate monitoring entity. i.e. supervision firm, PIU, public utility company, Contractor, Materials Suppliers, etc]	Prior to, and during installation and operation of BESS infrastructure.

Activities	Potential E&S Risks and Impacts	Proposed Mitigation Measures	Responsibilities	Timeline
		safe work practices, basic emergency procedures, and special hazards unique to their jobs.		
Installation of BESS - <i>Impacts on the Biological Environment</i>	- Impacts on natural habitats, ecological resources and biodiversity <u>including Forests and Wetlands/ Water courses</u>	- The selection of project sites will need to screen out ecologically sensitive areas such as forests and wetlands. BESS should not be installed in any important biodiversity or protected area. Such areas should be excluded and avoided since the installation of BESS has a limited footprint. - Avoiding clearing in riparian areas and avoiding use of machinery in the vicinity of water courses. - As much as possible consideration shall be given to alternative design ‘ to avoid trees. If there is need for a new tree to be planted, the relevant authorities such as the [insert name of relevant authority] shall	[Select an appropriate monitoring entity. i.e. supervision firm, PIU, public utility company, Contractor, etc]	Prior to, and during installation of BESS infrastructure

Activities	Potential E&S Risks and Impacts	Proposed Mitigation Measures	Responsibilities	Timeline
		be consulted in the identification of species and siting of replacement trees.		
Installation of BESS - <i>Impacts on Socio-economic environment.</i>	- <u>Community Health and Safety</u>	- Screening should ensure no sensitive receptors (e.g., residential areas) are present in the immediate vicinity of the sites where BESS will be installed. - Access to the sites during works must be restricted to avoid accidents and theft incidents. - Safety signs, symbols and barriers will be used at sensitive work locations. - Contractors will be required prepare and implement a Code of Conduct for construction workers which will include measures relating to SH/SEA, and to monitor the behavior of workers. - Store material away from easy public access. - Setting up and operationalizing	[Select an appropriate monitoring entity. i.e. supervision firm, PIU, public utility company, Contractor, etc]	Prior to, and during installation of BESS infrastructure

Activities	Potential E&S Risks and Impacts	Proposed Mitigation Measures	Responsibilities	Timeline
		Community Grievance Redress Mechanism and Committees. - Develop and implement as part of Contractor's ESMP (CESMP) a Site Security Management Plan guided by security risk assessment (where Security Personnel are used), undertaking due diligence background check on conduct of personnel deployed, ensuring their regular training on code of conduct and use of proportionate force when handling riots. - Recommended techniques to prevent electrocution hazards include: Use of signs, barriers (e.g. locks on doors, use of gates, education / public outreach to prevent public contact with potentially dangerous Equipment.		
	- <u>Gender Based Violence</u>	- SEA/ SH Action Plan is prepared for the project and will be implemented. - The contractors will be required	[Select an appropriate monitoring entity. i.e.]	During installation of BESS infrastructure

Activities	Potential E&S Risks and Impacts	Proposed Mitigation Measures	Responsibilities	Timeline
		to implement a Code of Conduct (extracted from the project ESMF) for construction workers which will include measures relating to SEA/SH, and expectations regarding the behavior of workers as well as reference to disciplinary actions that may be taken. - Locals will be sensitized and encouraged to report any such behavior or incidents through specific measures included in the project GRM for SEA/SH.	supervision firm, PIU, public utility company, Contractor, etc]	
	- <u>Inadequate stakeholder engagement and exclusion of vulnerable groups</u>	- Include women and other vulnerable groups in all stakeholder engagement. - Take into consideration the feedback from these groups in the project design and implementation. - Design GRM to make special provisions for addressing grievances from vulnerable groups. - Encourage employment of	[Select an appropriate monitoring entity. i.e. supervision firm, PIU, public utility company, Contractor, etc]	Prior to, and during installation of BESS infrastructure

Activities	Potential E&S Risks and Impacts	Proposed Mitigation Measures	Responsibilities	Timeline
		women, where possible with fair compensation.		
	- <u>Occupational Health and Safety</u>	- During construction of battery banks, special precaution in the transport and filling of the sulphuric acid serving as battery electrolyte has to be taken, given its highly corrosive nature. Personnel dealing with batteries should always wear protective personal equipment such as protective eyewear and gloves. - Only allowing trained and certified workers to install, maintain, or repair electrical equipment. - The contractors will be required to prepare a plan to address Occupation Health and Safety, which is expected to address induction and training of workers, conduct of tool box sessions, provision of personal protective equipment, provision of first aid kits, etc.	[Select an appropriate monitoring entity. i.e. supervision firm, PIU, public utility company, Contractor, etc]	Prior to, and during installation of BESS infrastructure

Activities	Potential E&S Risks and Impacts	Proposed Mitigation Measures	Responsibilities	Timeline
		- Any genset is to be located on a separate and well-ventilated room in relation to the battery banks. - To address safety concerns in battery storage systems, minimize the risks associated with thermal runaway, fire hazards, and chemical leakage by installing and using BMS which utilizes sophisticated algorithms and sensors to monitor and control battery performance in real-time, detecting abnormalities such as overcharging, over-discharging, and temperature fluctuations. - Install fire suppression technologies, including fire extinguishing agents, thermal barriers, and enclosure designs, essential for containing and extinguishing fires in battery storage systems. These technologies are designed to suppress flames, cool battery		

Activities	Potential E&S Risks and Impacts	Proposed Mitigation Measures	Responsibilities	Timeline
		cells, and prevent the spread of fire to adjacent equipment and structures, thereby minimizing damage and protecting personnel. - The PIU should closely work with the Regulatory agencies and industry organizations to ensure implementation of the (National) BESS standards and guidelines for the design, installation, and operation of battery storage systems to ensure compliance with safety requirements - Institutes emergency response procedures to handle any emergency incidents. - Incident/accident reporting through keeping log of incidents/accidents and remedial actions (in the event of an accident). - Provide personal protective equipment and first aid kits.		

Activities	Potential E&S Risks and Impacts	Proposed Mitigation Measures	Responsibilities	Timeline
		- Setting up Workers' Grievance Redress Committees to handle and process workers' complaints. - Providing workers with Contracts, with clear Terms of Employment and working conditions in accordance with the National Employment and Labour Laws. - Provide workers with gender segregated sanitation facilities (mobile toilets), with maintained hygiene.		
	- <u>Impacts on Public Social Services and Utilities</u>	- Control road traffic. - Avoid peak times and days such as market days.	[Select an appropriate monitoring entity. i.e. supervision firm, PIU, public utility company, Contractor, etc]	Prior to, and during installation of BESS infrastructure
	- <u>Land Acquisition, Land Use and Livelihoods</u>	The sites selected for the installation of the BESS will be screened to avoid or minimize any form of involuntary resettlement.	[Select an appropriate monitoring entity. i.e.	Prior to, and during installation of BESS infrastructure

Activities	Potential E&S Risks and Impacts	Proposed Mitigation Measures	Responsibilities	Timeline
		If needed develop RAP, LRP or VLD procedures	supervision firm, PIU, public utility company, Contractor, etc]	
	- <u>Impacts on Indigenous Peoples</u>	[List mitigation measures set out by IPPF/IPP]	[Select an appropriate monitoring entity. i.e. supervision firm, PIU, public utility company, Contractor, etc]	Prior to, and during installation of BESS infrastructure

8. CONSULTATIONS AND PUBLIC PARTICIPATION

8.1 Objectives of The Stakeholder Consultations

It is important that affected communities are given the opportunity to participate in the environmental and assessment process, particularly in the provision of information specific to the sites. 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.

The project will need to implement site-specific measures guided by the provisions in the SEP.

8.2 Summary of Issues During the Stakeholder Consultations

[Include a summary of the stakeholder engagement process carried out for the specific works at hand. This should include a brief analysis of project-affected parties, other interested parties, and vulnerable groups engaged, the efforts and instances of engagement, the project environmental and social aspects discussed, the questions and concerns expressed by stakeholders, and the feedback absorbed by project design].

[Include a table summarizing the comments and concerns raised during consultations with stakeholders. Remember to blur the first two columns (containing personal information) in the disclosure version of the ESMP in line with WB Policy on information disclosure]

Table 5: Summary of Comments received from stakeholders consulted

Name	Designation & Contact Information	Location	Comments and concerns/issues	Response and proposed mitigation measure to address raised issues

9. IMPLEMENTATION AND MONITORING ARRANGEMENTS FOR THIS ESMP

9.1 Implementation Arrangements, Roles and Responsibilities

[This section describes the institutional arrangements to implement the ESMP in relation to the assessment and identification of mitigation measures for subprojects, review, clearance and disclosure of the ESMP, carrying out the mitigation and monitoring measures, (for operation,

supervision, enforcement, monitoring of implementation, remedial action, financing, reporting and staff training). A clear delineation of responsibilities must be spelled out under this section. This should consider and describe functions and roles encompassing planning and design, and construction stage, an institutional arrangement for the authorities, project proponent, consultants, contractors and supervision engineers. For suggestions in relation to this, see the institutional arrangements provided in the project ESMF, and adapt accordingly. The text below can serve as a guide].

The Project Implementation Unit (PIU) under [fill in the name of the Ministry of Public Works authority housing the PIU] is responsible for the overall implementation of the Project and its ESMP. The E&S Specialists/Unit/Department [use whichever is applicable] will ensure the respective roles of each party are carried out on time. The PIU will ensure that the environmental and social requirements as detailed in the ESMP are part of the bidding and contract negotiation phase and part of the works contracts. The [include the names of the ministries, public utility companies, or institutions with oversight capacities], with their oversight responsibilities, shall liaise with the [Ministry or Public Utility company], housing the PIU, to ensure the Project is in line with legal requirements.

[Include mention of the national and local laws and regulations on Environmental and Social Impact Assessment (ESIA) and the stated arrangements and obligations set out to monitor, supervise and audit the ESMP implementation].

The table below summarizes the roles and responsibilities regarding the implementation arrangements for **environmental and social management**. [Complete table below and adapt as relevant for project].

Table 6: Implementation Arrangements – [Please complete this table as appropriate based on the project design and ESCP]

<i>Level/ Responsible Party</i>	<i>Roles and Responsibilities</i>
<i>World Bank</i>	• <i>Carry out bi-annual supervision missions;</i> • <i>.....</i> • <i>.....</i>
<i>National/ Regional, PIU and Government Authorities</i>	• <i>Undertake site inspections and monitoring</i> • <i>Report serious Incidents to the Bank within 48 hrs of occurrence.</i> • <i>.....</i> • <i>.....</i>
<i>Supervision Engineer</i>	• <i>Carry out E&S oversight role over the Contractor</i> • <i>Prepare and submit E&S compliance reports to PIU,</i> • <i>Review and approve the CESMP</i>

	• <i>Report serious incidents to the PIU within 24 hrs of occurrence.</i>
<i>1 Contractors and Materials Suppliers]</i>	• <i>Develop the C-ESMP/MSIP,</i> • <i>Hire E&S staff to implement CESMP,</i> • <i>Provide documentation and regular progress reports</i> • <i>.....</i> • <i>.....</i> • <i>....</i>

9.2 Institutional Training and Sensitization

Contractors shall include in their work plans and carry out training of workers on the required E&S risk management measures they are expected to implement as part of the daily activities.

During implementation, the PIU in conjunction with the Supervision Engineer, will undertake E&S performance assessment of the Contractor and service providers and develop tailor made E&S training plan and sensitization. Before commencement of implementation, E&S start up training of Contractor's workers shall be undertaken by the PIU and the Supervision Engineer.

During implementation, the PIU in conjunction with the Supervision Engineer, will undertake E&S performance assessment of the Contractor and service providers and develop tailor made E&S training plan and sensitization. Before commencement of implementation, E&S start up training of Contractor's workers shall be undertaken by the PIU and the Supervision Engineer.

At the bare minimum, the following topics shall be covered during workers' training:

- Specific aspects of environmental and social assessment and monitoring of the ESMP implementation.
- Occupational health and safety.
- Community Health and Safety.
- Codes of conduct for project workers.
- Traffic Management Plan (to relevant workers).
- Waste Management.
- Emergency preparedness and response.
- Combatting, and monitoring of HIV/AIDS, and other communicable diseases.
- Contractor and Operator management on environment and social risks.
- Grievances management implementation and monitoring.
- Sexual Exploitation and Abuse (SEA)/ Sexual Harassment (SH).
- Labor and Working Conditions, including employer compliance with national labor laws, and combatting of child labor and forced/trafficked labor.
- Undertaking Incidents Reporting, Root Cause Analysis and Corrective Action Plans.

PIU staff as needed should also receive training in topics such as resettlement and livelihood restoration, gender mainstreaming, Sexual Exploitation and Abuse (SEA)/ Sexual Harassment

(SH), stakeholder engagement and grievance management.

9.3 Monitoring of the ESMP

[Describe monitoring arrangements for environmental and social impacts as set out in national legislation and regulations, and implementation arrangements specific to the project. Institutions in charge of monitoring can include supervision firms, the PIU, national EIA authority, amongst other.]

The E&S staffing for the Supervision Engineer and the Contractor will be determined on a case-by-case basis depending on the scope of the sub-project. Minimum requirements have been suggested as Environmental Health and Safety Officer (EHSO) and Social Development Officer (SDO).

Table 7: ESMP Monitoring Program *[this is an example]*

Institution	Monitoring activity	Timeline	Recommended frequency	Requirements	Proposed budget (USD)
Supervision Engineer (EHSO, SDO)	Monitoring and evaluation of measures implemented by contractors	Whole Project Duration, especially during the installation of the BESS.	Daily	Logistics for monitoring field work	\$XX,XXX
PIU	Monitoring and evaluation of measures set out by ESMP	Whole Project Duration, especially during the installation of the BESS.	Monthly	Logistics for monitoring field work	\$XX,XXX
EIA Authority	Monitoring and evaluation of measures set out by national legislation	Whole Project Duration, especially during the installation of the BESS.	Bi-weekly. Monthly	Logistics for monitoring field work	\$XX,XXX
				TOTAL	\$XX,XXX

The responsibility for the environmental and social monitoring will largely lie with the PIU, the Supervision Engineer and the Contractor. The involvement of other stakeholders in monitoring compliance of the project with other aspects is not much anticipated due to short term nature of the construction phase of the BESS.

Sample key monitoring indicators of focus will include the following amongst others:

- a) Indicators of emissions, effluents, and resource use applicable to the particular project. Monitoring should be conducted by trained individuals following monitoring and record-keeping procedures and using properly calibrated and maintained equipment;
- b) Accident and Fatality Rates: Projects should try to reduce the number of accidents among project workers (whether directly employed or subcontracted) to a rate of zero, especially accidents that could result in lost work time, different levels of disability, or even fatalities;
- c) Facilities should also maintain a record of occupational accidents and diseases and dangerous occurrences and accidents;
- d) Traffic control measures put in place during construction phase of the project;
- e) Number of trees planted;
- f) Number of sensitization meetings held for the community on aspects of the project etc.; and
- g) Safety aspects on the project i.e. provision of PPEs for the workers, OSH trainings, Toolbox meetings,

During the construction period, the monitoring activities will focus on ensuring that environmental and social mitigation measures are implemented, and some performance indicators will be monitored to record environmental and social performance and to guide any remedial action to address unexpected impacts.

Proposed monitoring plan to be carried out during the implementation of the project to ensure contractors' compliance with the mitigation measures given in **Section 6 and Section 7** along with the monitoring indicators and frequency. The contractor will carry out the monitoring. The Monitoring **Table xxx below** will also be included in the contract specifications of the Bidding Documents.

[Please populate and complete the Monitoring Table below, as applicable to your subproject]

Environmental and Social Monitoring Parameters

S.No	Monitoring Parameter/ Activity	Means of Monitoring	Compliance Indicator/ threshold limits	Freq	Responsible Agency	
					Implementation	Supervision
1.	Air quality	Visual inspection of equipment/vehicle exhausts and records of vehicle maintenance.	All equipment and vehicles shall be maintained as per manufacturers recommendations.	Monthly	Contractor	RE, PIU
2.	Noise and vibration	Visual inspection of noise control measures.	Controls measures shall be in place for high noise generating equipment.	Monthly	Contractor	RE, PIU
3.	Wastewater discharges	Visual inspection of wastewater discharges.	All wastewater shall be directed to the airport's sewerage facility.	Monthly	Contractor	RE, PIU
4.	Waste management	Waste management as per the approved plan.	Facilities are clean, and waste collection and disposal facilities are in place.	Monthly	Contractor	RE, PIU
5.	Cleanliness at worksites and Residences	Visual inspections	Worksites shall be clean with out rubbish.	Monthly	Contractor	RE, PIU
6.	Water and sanitation facilities at workers' residences	Visual inspections and interviews	Availability of safe drinking water and sanitation facilities, and adequate kitchen supplies.	Monthly	Contractor	RE, PIU
7.	Water and sanitation	Visual inspections and	Availability of safe	Monthly	Contractor	RE, PIU

S.No	Monitoring Parameter/ Activity	Means of Monitoring	Compliance Indicator/ threshold limits	Freq	Responsible Agency	
					Implementation	Supervision
	facilities at worksites	interviews	drinking water and sanitation facilities.			
8.	Controls for workplace hazards	Visual inspection to ensure controls for workplace hazards are in place.	Implementation of Control Measures specified in the Job Hazard Analysis Reports.	Monthly	Contractor	RE, PIU
9.	Workers are trained on ESHS Risks and Code of Conduct	Inspection of training records and interviews with the workers	100 percent of workers are to be trained	Monthly	Contractor	RE, PIU
10.	Work at heights	Visual inspections and documents reviews	Method statement and permit to work in place. Use of safety harness, etc	Monthly	Contractor	RE, PIU
11.	Hydrocarbon and chemical storage and handling	Visual Inspection of storage facilities	No leakages from the containers in the storage. Handling follows procedures to avoid spillages.	Monthly	Contractor	RE, PIU
12.	Emergency Response Mechanism	Visual inspection	Fire extinguishers are in place at all work sites. Emergency routes are displayed.	Monthly	Contractor	RE, PIU
13.	Restoration of Work Sites	Visual inspection	The facilities are clean with no waste at the works sites	Monthly	Contractor	RE, PIU
14.	Traffic safety	Visual inspection for	The smooth flowing of	Monthly	Contractor	RE, PIU

S.No	Monitoring Parameter/ Activity	Means of Monitoring	Compliance Indicator/ threshold limits	Freq	Responsible Agency	
					Implementation	Supervision
		traffic management	traffic; and placement of traffic signs and flag-person			
15.	First Aid Kits at worksites and residences	Visual inspection and interviews	All worksites and worker's residences shall have adequate first aid kits	Monthly	Contractor	RE, PIU
16.	Grievances from labour	Records of grievances registered and resolved.	All grievances shall be addressed with 15 days of complaint.	Monthly	Contractor	RE, PIU
17.	Licensed equipment operators and vehicle drivers	Visual inspection of driving licenses	All operators and drivers shall have valid licenses	Monthly	Contractor	RE, PIU
18.	Use of PPE by staff	Visual inspection on use of relevant PPEs	100 percent use of PPE	Monthly	Contractor	RE, PIU
19.	Grievances from community	Records of grievances registered and resolved.	All grievances shall be addressed with 15 days of complaint.	Monthly	Contractor	RE, PIU
20.						
21.						

9.4 Reporting

Effective communication between contractors, the engineering supervision firm, the PIU, and the Environmental Authority is essential. Monthly reporting of monitoring and evaluation results from the contractors and supervision firm to the PIU is recommended. The PIU will report to the EIA Authority in accordance with national legislation and regulations.

If the *[responsible party in the implementing agency]* becomes aware of a serious incident in connection with the project, which may have significant adverse effects on the environment, the affected communities, the public, or workers, it should notify the World Bank within 48 hours of becoming aware of such incident. A fatality is automatically classified as a serious incident, as are incidents of forced or child labor, abuses of community members by project workers (including gender-based violence incidents), violent community protests, or kidnappings, lost time injury requiring 3 or more days off work, occurrence of a disease in excess of normal expectancy of number of cases, displacement without due process of compensation, unexpected impacts on heritage resources, unexpected impacts on biodiversity resources, environmental pollution incident, cases of sexual exploitation and abuse (SEA), sexual harassment (SH), and any other incident or accident that may have a significant adverse effect on the environment, the affected communities, the public, or the workers, irrespective of whether harm had occurred on that occasion. The incidents reporting, root-cause-analysis and correction action plan forms shall be developed by the PIU and reviewed by the World Bank Task Team to align with both the National reporting requirements with the World Bank Environmental and Social Reporting Tool (ESIRT) Templates. Provide sufficient details regarding the scope, severity, and possible causes of the incident or accident, indicating immediate measures taken or that are planned to be taken to address it, and any information provided by any contractor and/or supervising firm, as appropriate. Subsequently, at the World Bank's request, prepare a report on the incident or accident and propose measures to address it and prevent its recurrence.

9.5 Environmental and Social Auditing

Environmental and Social auditing will be carried out periodically during implementation (based on each Country Statutory requirement) and after the completion of project activities.

The E&S project completion Audit will be undertaken at least three months to the end of the implementation contract. The minor and moderate shortfalls can be implemented before the end of the Contract, and any substantial deviations shall be rolled into and implemented within the Defects Liability Period (DLP)..

Table 8: ESMP Implementation Budget *[Adopt and complete the Budget Table below]*

S.No.	Cost Item/ Activity	Unit Cost (USD)	Quantity	Total (USD)
	Hiring E&S Staff as part of the Operator/ Contractor and/RE team -	xx	xx	xx

	(Environmental Specialist, Social Development Specialist)			
	E&S Supervision and Monitoring by the Operator/ Contractor & RE (At-least Once per Month).	xx	xx	xx
	Periodic (Annual) Environmental and Social Audit.	xx	xx	xx
	Project Completion Audit (Post Project Implementation)			xx
	E&S Office Equipment (Laptops), E&S Monitoring Equipment (Insitu-Water Quality, GPS, Vehicle).	xx	xx	xx
				
	etc.....			
	TOTAL Budget			

10. REFERENCES