WTE POWER PLANT NORTH DHAKA PRIVATE LIMITED

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR THE TRANSMISSION LINE OF THE WASTE-TO-ENERGY POWER PROJECT AT AMIN BAZAR, DHAKA, BANGLADESH

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ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF) FOR THE TRANSMISSION LINE OF THE WASTE-TO-ENERGY POWER PROJECT AT AMIN BAZAR, DHAKA, BANGLADESH

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ACRONYMS AND ABBREVIATIONS

AAQ	Ambient Air Quality
AAQM	Ambient Air Quality Monitoring
AC	Alternating current
AD	Alluvion-Diluvion
AIDS	Acquired Immune Deficiency Syndrome
ANL	Ambient Noise Level
APHA	American Public Health Association
ARIPA	Acquisition and Requisition of Immovable Property Act
ARIPO	Acquisition and Requisition of Immovable Property Ordinance
As	Arsenic
BARC	Bangladesh Agricultural Research Council
BBS	Bangladesh Bureau of Statistics
BC	Bituminous Concrete
BDT	Bangladeshi Taka
BFD	Bangladesh Forest Department
BFIDC	Bangladesh Forest Industries Development Corporation
BFRI	Bangladesh Forest Research Institute
BIWTA	Bangladesh Inland Water Transport Authority
BMD	Bangladesh Meteorological Department
BNH	Bangladesh National Herbarium
BNBC	Bangladesh National Building Code
BPDB	Bangladesh Power Development Board
BRTA	Bangladesh Road Transport Authority
BWDB	Bangladesh Water Development Board
BOD	Biological Oxygen Demand
Ca	Calcium
Cd	Cadmium
CHTs	Chittagong Hill Tracts
Cl	Chlorine
cm	Centimeter
Cmol	Centimole
CO	Carbon Monoxide
COD	Chemical Oxygen Demand

1 INTRODUCTION

1.1 Background

According to PPA, this project uses a dual loop 132kV line to connect to the Savar 132/33kV substation. The length of the 132kV transmission line is about 5.99 km. The Savar 132/33 kV substation transformer's capacity is 3×50/75 MVA, with a maximum load of 158 MW and a minimum load of 147 MW.

1.2 Objective for Environmental and Social Management Framework

The ESMF would define a mechanism for integrating environmental and social concerns into the implementation of the Project. The ESMF would thus not only define process for planning and implementing the environmental and social safeguards in the Project components but also provide guidance to the planning and designing of transmission lines so as to avoid or minimize project footprint into environmentally and socially sensitive areas e.g. forest, sanctuaries, settlements etc.

As a project planning level guidance, the ESMF would propose a screening framework to identify environmental and social sensitivities during transmission line alignment identification. To facilitate this process, tools like analysis of alternative alignment for transmission lines, would be designed in the ESMF which would provide inputs into environmentally and socially sustainable design. Simultaneously as part of the processes for the implementation of environmental and social safeguards the ESMF would also provide the triggers for conducting Project component specific environmental and social assessment and specialised studies e.g. Resettlement Plan and Biodiversity Studies. It also defines the reference framework for the Project by identifying the provisions of the national legislations, guidelines and the ESF of the AIIB which have to be complied with during the lifecycle of the Project.

1.3 Scope of the Environmental and Social Safeguards Framework

The ESMF will provide procedures, measures and general plans for:

1 Environmental and social impact screening – assessment and monitoring of interventions planned under the Project:
   - Description of the requirements of the national Initial Environmental Examination (IEE)/ Environment Impact Assessment (EIA)/ Environment & Social Impact Assessment (ESIA) process.
   - Any additional provisions to be adhered to close any gaps vs international standards (as per gap analysis).

2 The process to develop site specific Environmental and Social Management Plans from the Generic ESMP contained in the ESMF.

3 Capacity building measures for ESMF implementation for different stakeholders; including E&S management capacity building measures for contractors/sub-contractors who will implement the project (including sub-contractors who will establish the household connections); capacity building and sensitization program for local communities.

4 Specific description of institutional arrangements, identifying which party is responsible for carrying out the mitigation and monitoring measures.

2 ADMINISTRATIVE AND LEGAL FRAMEWORK

This chapter provides legal and regulatory framework, covering national requirements as well as guidelines and standards to address environmental and social risks of any proposed project and its associated components and to protect and conserve the environment from any adverse impacts. The intent of this chapter is to discuss the regulatory context, which is directly related to environmental compliance, which must be adhered to by all parties involved in the project throughout the planning, construction, and operation.

2.1 Environment Related Policies in Bangladesh

The National Environment Policy of 1992 and the associated legislation on environmental protection and conservation represent the most important documents that relate to environmental protection and management in Bangladesh. The requirement of EIA for projects is described in these documents.

2.1.1 National Environment Policy, 2018

In 1992, the Bangladesh Government developed the National Environmental Policy (NEP) which defines the overall environmental framework and assigns responsibility for regulatory development, administration, and enforcement. This responsibility has been given to the Department of Environment (DOE) which is under the Ministry of Environment, Forest, and Climate Change. The National Environment Council, with the head of the government as chairperson, provides the overall policy direction.

In 26 years since adoption of Environment Policy, 1992, the nature and level of environment and ecological degradation have been changed. In order to address all those changes and with a view to protect and conserve environment and ecosystem in a rigorous, pragmatic and sustainable manner as well as to bring the climate change to the mainstream of the environment and development, the government has revised the National Environment Policy, 1992 and adopted the revised National Environment Policy, 2018.

Following are the key subject matters covered under the National Environment Policy, 2018:

- Ensuring sustainable development through reducing human pressure on nature and natural resources.
- Considering environment protection as an integral part of the development programs planned to meet the need of the present and future generation.
- Making natural resources extraction, use, environmental conservation etc. based on science.
- Considering environmental impacts and risks in extracting and using natural resources.
- Evaluating the economic contribution of ecosystem services simultaneously to that of natural resources.
- Giving priority to poor and under privileged groups of people in order to ensure their participation, equity, justice, accessibility to the use of natural resources and getting ecosystem services on which, they are dependent.
- Taking initiatives to prevent misuse and ensure optimum use of water, land, natural gas and other natural resources in the production process as well as day-to-day purposes.
- Encouraging sustainable use of new and renewable resources.
- Enhancing long term poverty alleviation and food security through conserving biological diversity.
- Realizing compensation from persons and institutes those who are liable to environmental pollution through applying polluter pay principle.
- Including environmental conservation and preservation in all national policies and ensuring implementation of the environment policy at both government and nongovernment level.

- Giving priority to preventive measures over curative measures in environmental conservation.
- Including adaptation and mitigation program in all development projects in order to address adverse impacts of climate change.
- Ensure sustainable utilization of ecosystem goods and services.
- Implementation of 3R principle in utilization of resources.
- Strengthening institutional and legal capacity of institutions (Government, local, private, and technical) relevant to the enforcing and implementation of rules and regulation relating to environment policy and environment conservation.
- Ensuring considerations of climate change and challenges of calamities in all kinds of infrastructure projects.
- Reducing all SLCP (Short-Lived climate pollutants) which are harmful to health and environment.
- Taking development programs considering sustainable production and consumption as integral part of environmental conservation to meet the need of present and future generation.
- Allocating necessary funds to all areas of environmental conservation, preservation, and control.
- Taking up programs in favor of flourishing environment friendly economy.

The policy has provided sector wise policy coverage for 24 different sectors along with their plan of implementation, identification of respective implementing agencies, legal and institutional framework, and directives on compliances.

2.1.2 National Environment Management Action Plan, 1995

The NEMAP is a wide-ranging and multi-faceted plan, which builds on and extends the statements, set out in the NEP. NEMAP was developed to address issues and management requirements related to the environment during the period 1995 to 2005; it also sets out the framework within which the recommendations of the NCS are to be implemented. NEMAP was developed to achieve the following broad objectives:

- Identification of key environmental issues affecting Bangladesh.
- Identification of actions necessary to halt or reduce the rate of environmental degradation.
- Improvement of the natural environment.
- Conservation of habitats and biodiversity.
- Promotion of sustainable development.
- Improvement of the quality of life of the people.

To attain the above-mentioned objectives, the plan groups all the relevant necessary actions under four headings, namely: institutional, sectoral, location-specific, and long-term issues.

The institutional aspects reflect the need for inter-sectoral cooperation to tackle environmental problems that need new and appropriate institutional mechanisms at national and local levels. Sectoral action reflects the way the ministries and agencies are organized and makes it easier to identify the agency to carry out the recommended actions. The location-specific action focuses particularly on acute environmental problems at local levels that need to be addressed on a priority basis. The long-term actions include environmental degradation to such a degree that might become even more serious and threatening if cognizance is not taken immediately.

2.1.3 The National Biodiversity Strategy and Action Plan, 2004

The National Biodiversity Strategy and Action Plan (NBSAP) of Bangladesh provides a framework for conservation, sustainable use and sharing the benefits of biodiversity of the country. A major focus of the NBSAP is the need for cross-sectoral linkages, reflecting the fact that in Bangladesh, more so than most other countries, biodiversity conservation is closely inter-woven with social and economic

development. Thus, the NBSAP also provides a framework for securing the necessary environmental conditions to reduce poverty, ensure sustainable development and respond to the implementation of elements of the country's Poverty Reduction Strategy Paper (PRSP). The major objectives of the NBSAP are to:

- Conserve and restore the biodiversity of the country for the wellbeing of the present and future generations.
- Ensure that long-term food, water, health, and nutritional security of the people are met through conservation of biological diversity.
- Maintain and improve environmental stability of ecosystems.
- Ensure preservation of the unique biological heritage of the nation for the benefit of the present and future generations.
- Guarantee the safe passage and conservation of globally endangered migratory species, especially birds and mammals in the country.
- Stop introduction of invasive alien species, genetically modified organisms and living modified organisms.

2.2 Environment and Social Related Legislations in Bangladesh

The main acts and regulations guiding environmental protection and conservation in Bangladesh are outlined in the following subsections.

2.2.1 The Environment Conservation Act, 1995 and Subsequent Amendments

The Bangladesh Environmental Conservation Act (BECA), 1995 is the main legislation for conservation of the environment, improvement of environmental standards, and control and mitigation of environmental pollution.

The provisions of the act authorize the Director General of DOE to undertake any activity that is deemed fit and necessary to conserve and enhance the quality of the environment and to control, prevent and mitigate the pollution. The main highlights of the act are:

- Declaration of Ecologically Critical Areas (ECAs).
- Obtaining an Environmental Clearance Certificate (ECC).
- Regulation with respect to vehicles emitting smoke harmful to the environment.
- Regulation of development activities from an environmental perspective.
- Promulgation of standards for quality of air, water, noise, and soils in different areas and for different purposes.
- Promulgation of acceptable limits for discharging and emitting waste.
- Formulation of environmental guidelines relating to control and mitigation of environmental pollution, conservation, and improvement of the environment.

2.2.2 The Environment Conservation Rules, 2023

The Environment Conservation Rules (ECR), 2023 is the main subsidiary legislation of the Environment Conservation Act, 1995 which outlines various procedures or measures that need to be taken for compliance with the related provisions of the Environment Conservation Act, 1995. The Environment Conservation Rules, 2023 is the first set of rules promulgated under the Environment Conservation Act, 1995. These rules provide for, inter alia, the following:

- Categorization of industries, development projects, and other activities on the basis of actual (for existing industries/development projects/activities) and anticipated (for proposed industries/development projects/activities) pollution load. The categories are green, yellow, orange, and red.

- Procedure for obtaining site clearance and environmental clearance.
- Standards for surface water (inland and coastal), drinking water, sewage discharge, and industrial effluents.
- Setting out guidelines for the proper disposal of industrial effluents and requiring industries to have proper effluent management systems i.e., industrial effluent treatment plant, sewerage treatment plant, and mixed effluent treatment plan in place.
- Requirements for undertaking initial environmental study and environmental impact assessment as well as formulating environmental management plan according to categories of industries/development projects/activities.
- Procedure for damage claim by persons affected or likely to be affected due to polluting activities or activities causing hindrance to normal civic life.
- Establishing the Department of Environment (DOE) as the regulatory authority responsible for enforcing the regulations and overseeing environmental protection efforts in Bangladesh.

The ECR provides specific rules and procedures for various categories of projects in relation to their approval prior to construction and operation. For projects and activities listed within the red category, the ECR requires that an Initial Environmental Evaluation (IEE) be first submitted for approval, and this can be accompanied with the terms of reference (TOR) for an EIA, which is to follow the IEE. However, this stage may be opted out by an application to directly submit an Environmental Impact Assessment (EIA) report to the DOE for its review and approval prior to the issuance of an Environmental Clearance Certificate (ECC). The EIA is to be based on a TOR that has the prior approval of the DOE.

The transmission line project falls under Orange Category which also required SCC/ECC from DOE, Bangladesh. The project developer has to prepare a separate Initial Environmental Examination (IEE) study to get the DoE clearance.

2.2.3 Noise Pollution (Control) Rules, 2006

This rule has been promulgated under the provision of clause 20 of the Environment Conservation Act, 1995. The rules provide for standard limits of noise level of vehicles and designated areas. According to the Rules, motor honking within a 100-meter radius of a hospital, school and office is prohibited. The rules also do not allow use of brick crushers and cement mixers within a 500-meter radius of a residential area. Besides, prior permission is mandatory for using loudspeakers or megaphones. The rules stipulate safety and precautionary measures in workplaces, designated authorities for allowing noise generating appliances.

- The Rules have been established to manage noise-generating activities, which have the potential to impact the health & well-being of workers and the surrounding communities.
- An area up to a radius of 100 meters around hospitals, educational institutions, offices, or similar types of institutions is designated as a silent area. The acceptable sound limit in the silent areas is 50 dB(A) for daytime and 40 dB(A) for nighttime.
- The residential areas are primarily occupied by dwellings. The acceptable sound limit in residential areas is 55 dB(A) for daytime and 45 dB(A) for nighttime.
- Mixed areas with a mix of residential, commercial & industrial land use. The acceptable sound limit in the mixed areas is 60 dB(A) for daytime and 50 dB(A) for nighttime.
- Commercial areas are primarily occupied by businesses and officers. The acceptable sound limit in commercial areas is 70 dB(A) for daytime and 60 dB(A) for nighttime.
- Industrial areas are used for industry or manufacturing. The acceptable sound limit in the industrial areas is 75 dB(A) for daytime and 70 dB(A) for nighttime.
- An area between 500 meters from the last limit of a residential area for construction-related activity use of brick and stone crusher machine is prohibited and operation of mixture machine and construction-related machinery and equipment are prohibited from 7 PM to 7 AM.
- The guidelines say exceeding the maximum noise level in certain areas is a punishable offense.

2.2.4 Air pollution (Control) Rules 2022

To protect environmental health, the government has published a new rule under section 20 of The Bangladesh Environment Conservation Act, 1995. The main objectives of this rule are to prevent, control, and reduce air pollution. A director general will be appointed to manage and maintain environmental issues. The rule specifies several types of pollution, including those caused by factories, vehicles, construction, and garbage. A committee will be established to impose damages and punishments for such pollution. Additionally, the government will reward individuals who actively protest against pollution and refrain from causing any form of pollution.

2.2.5 EIA Guidelines for Industry, 2021

The EIA Guidelines are a handbook for procedures for preparing the EIAs and for reviewing them for the benefit of the development partners, EIA consultants, reviewers, and academicians. While preparing these guidelines, the present environmental status, as well as the need for the rapid economic development of Bangladesh, has been kept in view. These considerations have essentially resulted in simpler procedures to be followed to prepare the EIAs and their review.

The EIA Guidelines for Industry, 2021, introduced by the Department of Environment, Bangladesh, is the only guideline for conducting an Environmental Impact Assessment in Bangladesh. It is not only for industries but also for all types of development works. It includes EIA procedures, methodology, guidelines for impact identification, prediction and evaluation, plans for mitigation measures, and monitoring program.

2.2.6 Biodiversity Act, 2017

The Act has enabled the government to form a "National Committee on Biodiversity," tasked with conserving biodiversity, genetic biodiversity, and identifying important biodiversity-related areas and heritage sites. The government is empowered to declare any place or area significant for its biological heritage as "Biodiversity Heritage Sites," in consultation with local communities and in coordination with concerned ministries or departments. The Act also prohibits activities that may adversely affect endangered animals, organisms, or ecological communities. No person shall engage in activities that (a) adversely affect endangered species, (b) adversely affect the environmental characteristics of endangered ecological communities, or (c) adversely affect wetlands in accordance with the Ramsar Convention.

2.2.7 Relevant Policies

Other relevant policies in Bangladesh and their key features and applicability to the subject project are detailed in following Table 2-1.

Table 2-1: Policies and Plans Relevant to the Project

Policy/Plans	Responsible Agency-Ministry/Authority	Key Features	Applicability
National Environment Policy, 2018	Ministry of Environment, Forest, and Climate Change	• Encourage collection and promotion of low carbon emission technology in the country. • Identifying and controlling all types of environmental pollution and degradation activities. • Ensure sustainable, long-term, and environmentally friendly use of all-natural resources. • To take PPP for the development of the environment. • Maintain and streamline the environmental policies and strategies among other policy strategies in the interest of sustainable development. • Ensure the EIA and SEA in all necessary sectors. • Act to reduce poverty through environmental protection. • Strengthen observations on proper compliance with environmental laws and regulations.	Applicable - as the proposed project has the likeliness of having an impact on the surrounding environment
Bangladesh Climate Change Strategy and Action Plan, 2009	Ministry of Environment, Forest, and Climate Change	• Food security, social protection, and health. • Comprehensive disaster management. • Infrastructure. • Research and Knowledge management. • Mitigation and low carbon development. • Capacity building and institutional strengthening.	Applicable - As the project has the potential to generate pollutants in the air and GHG emission.
National Forest Policy, 2016	Bangladesh Forest Department/ Ministry of Environment, Forest, and Climate Change	• Manage all existing forests, wildlife, and other forestry resources, adhering to the principles of sustainable management and climate resilience. • Enrich degraded forest areas and enhance land areas under forest/ tree cover. • Produce a wide array of goods and ecosystem services for the benefit of Bangladesh's present and future generations.	Not Applicable – As there is no designated forest in the 5 KM buffer of the project boundary.
National Water Policy, 1999	Ministry of Water Resources	• Protection and prevention of the natural environment for ensuring sustainable development.	Applicable – The project proponent should minimize the water pollution,

Policy/Plans	Responsible Agency-Ministry/Authority	Key Features	Applicability
		• Minimize disruption to the natural aquatic environment in streams and water channels. • Water development plans will not interrupt fish movement and will make adequate provisions in control structures for allowing fish migration and breeding. • Water development projects should cause minimal disruption to navigation and, where necessary, adequate mitigation measures should be taken. • Full consideration to environmental protection, restoration, and enhancement measures consistent with NEMAP and the NWMP. • Ensure adequate upland flow in water channels to preserve the coastal estuary ecosystem threatened by the intrusion of salinity from the sea.	minimize disruption of aquatic environment and navigation system in the adjacent water body.
National Fisheries Policy, 1999	Ministry of Fisheries and Livestock	• Provide provisions for the protection and conservation of fish in freshwater and brackish water bodies. • Preservation, management, and exploitation of fisheries resources in inland open water. • Fish cultivation and management in inland closed water. • Prawn and fish cultivation in coastal areas. • Preservation, management, and exploitation of sea fishery resource. • Conserve fish breeding grounds and habitats; and • promote fisheries development and conservation in all water bodies.	Not Applicable - the proposed project site is not a designated fishing zone. Fish capture and culture are prohibited for the project workers.
National Agriculture Policy, 2018	Ministry of Agriculture	• Ensure food security and socio-economic development through the productivity of crops, boosting production and raising farmers' income, diversifying crops, producing safe foods, and developing a marketing system, profitable agriculture & use of natural resources. • Increasing food availability, rights, and purchasing power by increasing crop productiveness and production. • Discourage the use of agricultural land for non-agricultural work to ensure sustainable food security.	Applicable - the project is going to be established in the agricultural land and productivity may reduce due to the implementation of the proposed project.

Policy/Plans	Responsible Agency-Ministry/Authority	Key Features	Applicability
		• Soil, water, flora, fauna and overall environmental conservation and effective use initiative adoption;	
National Land Use Policy, 2001	Ministry of Land	• Resisting the current trend of alarmingly declining the total amount of agricultural land used to produce adequate food for a growing population for a variety of reasons. • To prevent arbitrary use of land. • To formulate guidelines for the maximum use of land according to the natural differences in different parts of the country. • In the case of land acquisition for urbanization and development projects or any other purpose, to ensure its best use by acquiring the least amount of land and to avoid the acquisition of excess land as required. • Arranging for the preservation of such lands, especially government Khas lands, which may be required in the future for various development activities. • To ensure that the use of land is compatible with the natural environment. • Making the best use of land to alleviate poverty and increase employment; and • To play a helpful role in preventing the increase in the number of landless.	Applicable
National Energy Policy, 1995	Ministry of Power, Energy, and Mineral Resources	• Utilization of energy for sustainable economic growth, supply to different zones of the country, development of the indigenous energy sources & environmentally sound sustainable energy development programs. • It highlights the importance of protecting the environment. • EIA should be made mandatory and should constitute an integral part of any new energy development project. • Use of economically viable environment-friendly technology. • Public awareness regarding environmental conservation; and • Ensure environmentally sound sustainable energy development programs causing minimum damage to the environment.	Applicable
Power Policy, 1995	Ministry of Power, Energy, and Mineral Resources	• Policy statement on demand forecast, long term planning and project implementation, investment terms, fuels and technologies, load management, institutional issues, private	Applicable

Policy/Plans	Responsible Agency-Ministry/Authority	Key Features	Applicability
		sector participation, technology transfer, and research program, environmental policy, and legal issues.	
Power System Master Plan, 2016	Ministry of Power, Energy, and Mineral Resources	• The power sector was heavily dependent on gas. Even two/three years back almost 90% of the electricity used to be generated from the natural gas of the country and rest by hydroelectricity and coal. • Stressed on diversification of the fuel such as natural gas, coal, furnace oil, diesel, etc. as well as renewable energy sources. • The target composition of power supply as of 2030 is set at 50% for domestic and imported coal, 25% for domestic and imported (in the form of LNG) natural gas, and 25% for other sources such as oil, nuclear power, and renewable energy.	Applicable
Acquisition and Requisition of Immovable Property Act (ARIPA), 2017	Ministry of Land	• Current GoB ARIPA ,2017 Act, relating to acquisition and requisition of land. • According to the law, if the land is being acquired for government projects, then the affected landowner will be entitled to receive an additional 200% compensation of the assessed market value for the land and on the other hand, if the land is being acquired for private entity, then the affected landowner will be entitled to receive an additional 300% of the assessed market value for the land. • An additional 100% compensation to be awarded for assessed market value of structures, trees, crops and other assets on the acquired land parcel. This law is applicable to deals with any potential social and economic impacts associated with land acquisition activity.	**Applicable for Land Acquisition**-Upon request of the proponent, WPPNDPL will acquire or purchase the required land.
Electricity Act, 2018	Ministry of Power, Energy and Mineral Resources	• If acquisition of land is required for establishment of power generation plant or sub-station, it shall be deemed to have been necessary for public interest and the existing laws and regulations on acquisition of land shall have to be followed. • If any private company holding license requires any land for constructing any connection line with power station, sub-station or grid substation the licensee may purchase or acquire such land from the concerned land owner in accordance with the existing laws and regulations regarding land acquisition.	**Applicable.**

Policy/Plans	Responsible Agency-Ministry/Authority	Key Features	Applicability
		• If any damage, harm or inconvenience is caused while doing civil works under this Act, the licensee shall, in such manner as may be prescribed by rules, pay compensation to the person affected or the owner of the land affected for acquiring land for construction of electricity towers. • If any dispute arises from the amount payable as compensation under sub-section (1), the provisions of the Commission Act shall apply to settle such dispute. • For the purpose of laying power supply lines or doing civil works under this Act, the licensee shall reserve the right of way over the land and the space above or underground thereof : Provided that the licensee shall inform the land owner in writing before laying of power supply lines and doing civil works within a reasonable time. • The activities of laying power supply lines or doing civil works adjacent to underground drains, pipes or existing power supply lines or civil works shall be rendered in such manner as may be prescribed. • If any road, railway, underground drain, sewer or tunnel is damaged in consequence of civil works, the part excavated shall have to be filled up by soil, the part damaged shall have to be repaired and the garbage shall have to be removed immediately after such works. • If any licensee intends to carry out any new civil works or repair or modification thereof on any service line or power supply line running through any part of telephone or internet lines, he shall issue notice in writing to the concerned telecommunication or the internet service provider agency regarding such works	
Electricity Rules 2020 and amendments in 2022	Ministry of Power, Energy and Mineral Resources	Electricity Rules have been published by ministry on November 2020 based on Clause 59 of Electricity Act 2018 (SRO 297 of Act/2020). The main observation is to provide compensation for the installation of transmission line towers to the landowners as per the applicable laws and policy. - The Electricity Rules 2020 provides guidelines for RoW selection, impact identification and compensation for the	**Applicable-**as the project will subject to the act of generating electricity and supply through a transmission line. WPPNDPL shall ensure to provide the compensation

Policy/Plans	Responsible Agency-Ministry/Authority	Key Features	Applicability
		affected assets including the land required for construction of towers. - Replacement cost for the land affected for construction of towers under electricity rules 2020. • One-time Cash compensation to the legal landowners at current market price and for damaged crops and any other affected assets according to Electricity Rules 2020.	to project affected persons (PAPs) according to the rules.
National Occupational Health and Safety Policy, 2013	Department for Inspection of Factories and Establishment/ Ministry of Labor and Employment	• Necessary measures to ensure workplace safety and health protection in light of international Conventions/Declarations/ Recommendations/ Instruments. • Review and updating of all laws relating to Occupational Health and Safety (OHS); • Inclusion of OHS issues in the policies and programs of all related Ministries and agencies. • Establish labor courts in the industrial zone as the workers and trade unions can have easy access to the courts for implementing the mandatory provisions of OHS. • Impose mandatory terms and conditions upon construction agencies to follow the OHS policies during govt. run construction works; and • To ensure maximum safety standards during construction and implement all standards and regulations on an internal safety environment.	Applicable - as the policy pertains to the occupational rights and safety of workers and has the provision of a comfortable work environment and reasonable working conditions for all employees.

2.3 Administrative Setup Related to Environment in Bangladesh

The Ministry of Environment, Forest, and Climate Change is the nodal agency in the administrative structure of the GOB, overseeing all environmental matters relating to national environmental policy and regulatory issues in the country. The Ministry of Environment, Forest, and Climate Change oversees the activities of the following technical/implementing agencies:

- Department of Environment (DOE)
- Bangladesh Forest Department (BFD)
- Bangladesh Forest Industries Development Corporation (BFIDC)
- Bangladesh Forest Research Institute (BFRI)
- Bangladesh National Herbarium (BNH)
- Water Resources and Planning Organization (WARPO)
- Bangladesh Inland Water Transport Authority (BIWTA)
- Ministry of Fisheries and Livestock (MOFL)
- Bangladesh Power Development Board (BPDB)
- Ministry of Labor and Employment (MOLE)
- Ministry of Law and Parliamentary Affairs
- Ministry of Land (MOL
- City Corporation/Pourashabha/Union Parishad.

2.3.1 Department of Environment (DOE), Bangladesh

The DOE has been placed under the MOEFCC as its technical wing and is statutorily responsible for the implementation of the ECA, 1995. The department was created in 1989, to ensure sustainable development and to conserve and manage the environment of Bangladesh. The principal activities of the DOE are:

- Defining EIA procedures and issuing environmental clearance permits the latter being the legal requirement before the proposed Project can be implemented.
- Providing advice or taking direct action to prevent the degradation of the environment.
- Pollution control, including the monitoring of effluent sources and ensuring mitigation of environmental pollution.
- Setting Quality Standards for environmental parameters.
- Declaring ECAs, where the ecosystem has been degraded to a critical state.
- Review and evaluation of IEEs and EIAs prepared for projects in Bangladesh.

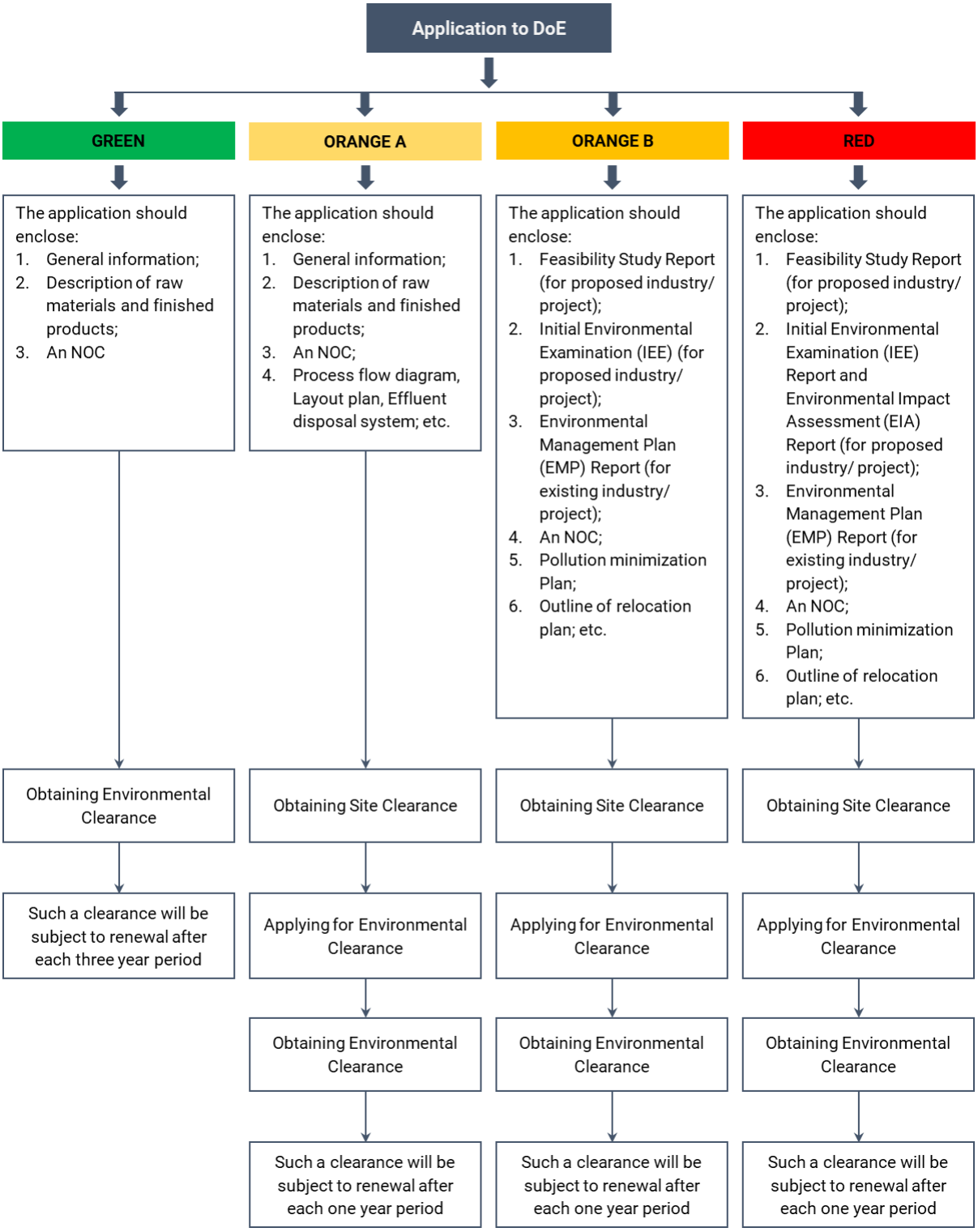
2.3.2 Procedure for obtaining ECC from DOE, Bangladesh

The applicability of environmental clearance and the process in Bangladesh is described in Figure 2-1. The EIA process consists of three stages, screening, IEE, and detailed EIA:

- Projects categorized as Green and Orange-A requires no IEE or EIA for environmental clearance, however, the proponent has to submit an application in a prescribed format along with specified documents.
- Projects categorized as Orange-B require an IEE to be submitted to the DOE along with an application in a prescribed format and other specified documents.
- Red category projects require both IEE and EIA. An IEE is required for the location clearance and an EIA is required for the environmental clearance.

As per the Schedule-1 of ECR 2023, the project falls under the Orange Category. The process of obtaining an Environmental Clearance Certificate for the proposed project is outlined in Figure 2-1.

Figure 2-1: DOE Environmental Clearance Applicability and Procedure



Source: Department of Environment (DOE), Bangladesh

2.4 Asian Infrastructure Investment Bank (AIIB) Environmental and Social Framework

The proposed project is being financed by AIIB and therefore its Environmental and Social Framework will be applicable to the project.

2.4.1 Objectives of AIIB's Environmental and Social Framework

The objectives of the AIIB's environmental and social framework (ESF) are:

- Reflect institutional aims to address environmental and social risks and impacts in Projects.
- Provide a robust structure for managing operational and reputational risks of the Bank and its shareholders in relation to Projects' environmental and social risks and impacts.
- Ensure the environmental and social soundness and sustainability of Projects.
- Support integration of environmental and social aspects of Projects into the decision-making process by all parties.
- Provide a mechanism for addressing environmental and social risks and impacts in Project identification, preparation, and implementation.
- Enable Clients to identify and manage environmental and social risks and impacts of Projects, including those of climate change.
- Provide a framework for public consultation and disclosure of environmental and social information in relation to Projects.
- Improve development effectiveness and impact to increase results on the ground, both short- and long-term.
- Support Clients, through Bank financing of Projects, to implement their obligations under national environmental and social legislation (including under international agreements adopted by the member) governing these Projects.
- Facilitate cooperation on environmental and social matters with development partners.

2.4.2 Key Elements of Environmental and Social Framework

Overarching Policy. The objective of this overarching policy is to facilitate achievement of these development outcomes, through a system that integrates sound environmental and social management into Projects. The overarching policy comprises Environmental and Social Policy (ESP), and Environmental and Social Standards (ESSs).

Environmental and Social Policy

The ESP sets out mandatory requirements for the Bank and its Clients relating to identification, assessment and management of environmental and social risks and impacts associated with Projects supported by the Bank.

Environmental and Social Standards

The environmental and social standards (ESSs) set out more detailed mandatory environmental and social requirements, as described below.

Environmental and Social Standard 1 (ESS 1) The ESS-1 aims to ensure the environmental and social soundness and sustainability of Projects and to support the integration of environmental and social considerations into the Project decision-making process and implementation. ESS 1 is applicable if the Project is likely to have adverse environmental risks and impacts or social risks and impacts (or both). The scope of the environmental and social assessment and management measures are proportional to the risks and impacts of the Project. ESS 1 provides for both quality environmental and social assessment and management of risks and impacts through effective mitigation and monitoring measures during the course of Project implementation. ESS 1 defines the detailed requirements of the environmental and social assessment to be carried out for any project to be financed by the Bank.

Environmental and Social Standard 2 (ESS 2) The ESS 2 is applicable if the Project's screening process reveals that the Project would involve Involuntary Resettlement (including Involuntary Resettlement of the recent past or foreseeable future that is directly linked to the Project). Involuntary Resettlement covers physical displacement (relocation, loss of residential land or loss of shelter) and

economic displacement (loss of land or access to land and natural resources; loss of assets or access to assets, income sources or means of livelihood) as a result of: (a) involuntary acquisition of land; or (b) involuntary restrictions on land use or on access to legally designated parks and protected areas. It covers such displacement whether such losses and involuntary restrictions are full or partial, permanent, or temporary. The ESS 2 Environmental and Social Impact Assessment (ESIA) defined detailed requirements of resettlement planning of the projects involving involuntary resettlement.

Environmental and Social Standard 3 (ESS 3) The ESS 3 is applicable if Indigenous Peoples are present in, or have a collective attachment to, the proposed area of the Project, and are likely to be affected by the Project. The term Indigenous Peoples is used in a generic sense to refer to a distinct, vulnerable, social and cultural group possessing the following characteristics in varying degrees: (a) self-identification as members of a distinct indigenous cultural group and recognition of this identity by others; (b) collective attachment to geographically distinct habitats or ancestral territories in the Project area and to the natural resources in these habitats and territories; (c) customary cultural, economic, social or political institutions that are separate from those of the dominant society and culture; and (d) a distinct language, often different from the official language of the country or region. In considering these characteristics, national legislation, customary law, and any international conventions to which the country is a party may be taken into account. A group that has lost collective attachment to geographically distinct habitats or ancestral territories in the Project area because of forced severance remains eligible for coverage, as an Indigenous People, under ESS 3. The ESS 3 defines the detailed requirements of People planning, in case such groups are present in the project area and are likely to be affected by the project.

2.4.3 Applicability of ESS for the Proposed Project

The applicability ESSs for the proposed project is presented in Table 2-2

Table 2-2: Applicability of AIIB ESS to this Project

Environmental and Social Standards		Applicability	Triggering Status
ESS 1	Environmental and Social Assessment and Management	ESS 1 is applicable if the Project is likely to have adverse environmental risks and impacts or social risks and impacts (or both)	Yes, since the proposed project is likely to have negative environmental and social impacts
ESS 2	Involuntary Resettlement	ESS 2 is applicable if the project is likely to cause involuntary resettlement impacts.	Yes. The project involves economic displacement due to the siting of the project.
ESS 3	Indigenous Peoples	ESS 3 is applicable if Indigenous People are present in the project area	No, since no Indigenous people, as defined in the ESS 3 are present in the project area and affected by the project.

3 PROJECT DESCRIPTION

3.1 Project Overview

3.1.1 Introduction

According to PPA, this project uses a dual loop 132kV line to connect to the Savar 132/33kV substation. The length of the 132kV transmission line is about 5.99 km. The Savar 132/33 kV substation transformer's capacity is 3×50/75 MVA, with a maximum load of 158 MW and a minimum load of 147 MW.

The benefits of the option are:

- The most reliable portion from the view of fault occurrence because number of faults in 132kV
- transmission rarely occurring.
- Low Interconnection losses 0.278 MW
- Space available for constructing Interconnection facilities at Savar 132kV Substation.
- This option does not create any additional network constraints at 132Kv grid network.

3.1.2 Location of the Transmission Line

The proposed transmission line is located in the north-central region of Bangladesh. The specific project site is in Dhaka District, Savar Upazila under Ward 6, Ward 9, Bangaon union and Tentuljhora Union. This transmission line crosses the Karnataka River 2 times. This Karnatali River originated from Dhaleswari river near Savar upazila and outfall into the Turag River near Mirpur.

3.1.3 Land Use Pattern of Proposed Transmission Line

The establishment of the transmission line will convert cropland to industrial use in the long term. The site is currently used for Paddy, Chilli, Brinjal, Bottle Gourd, Snake Gourd, Pumpkin, Water Pumpkin, Sugar cane, Red Spinach, Water Spinach Seeds cultivation. During the field survey, it is observed that no households are residing inside the proposed tower footing area. No structural displacement and economic displacement have observed in the tower footing area. Approximately 50 different sizes of trees may need to be cut during the construction of transmission line. The land-use change may have an impact on the livelihood of the landowners and land users/farmers. However, the impact on land use will only be within the RoW of transmission line and will not affect any of the neighboring areas. Furthermore, the changes to the land use will be reversible and can be used for agricultural purposes during operation and after the decommissioning of the project.

3.1.4 Land Requirement for Transmission Line

The proposed transmission line will require approximately 89.063 decimal (0.89 acres) of land for tower footing construction. Most of the land is privately owned land which is currently used for cultivation. As per Electricity act 2018, Chapter 3, Section 14 of 2, if any private company holding license requires any land for constructing any connection line with power station, sub-station or grid substation the licensee may purchase or acquire such land from the concerned landowner in accordance with the existing laws and regulations regarding land acquisition. The land purchase is now under processing. The project developer has to purchase the land ensuring AIIB ESF, Electricity Act, 2018, Electricity Rules 2020 (amendment 2022) or ARIPA, 2017 guidelines.

As per the Electricity Act, 2018, and the Electricity Rules, 2020 (amended in 2022), the proponent will compensate the landowners based on the current market price. The current market price will be provided by the proponent with support from the Sub-Registry Office of the respective area.

After conducting the market assessment, the proponent will be ensured that the compensation is equivalent to or greater than the Replacement Cost to meet AIIB's ESF guidelines.The landowner can use the land after TL construction without damaging Tower and Its equipment as per Electricity Rules 2020 Section 10, Subsection 6.

As per the initial field visit, there is no structure found in the proposed land to be acquired for tower footing. So, no physical displacement and relocation is required for this TL. Only economic displacement will be involved. The tower footings for laying transmission lines require land compensation as per Electricity Rules 2020 even if land for tower footings will not be acquired. Compensation will be provided for standing trees under RoW which require felling before laying the transmission lines. During construction, if any crops, structures or any other assets are affected, will be compensation according to the entitlement proposed in the RP.

3.1.5 Details of Transmission Line Route

The transmission line route is initiated from the North-West corner of the plant along the Karnatali Riverbank. The length of the route is approximately 5.99 km. Total angle points are 14, and the number of Towers will be 27. The details of each tower location have been represented in **Figure 3-1** along with the geographical location and angle deviation for each of the points. Transmission lines are essential components of the electrical grid, used to transport electrical energy from power stations to distribution networks or directly to consumers. Photographs of transmission line route survey have been given in **Appendix O**.

Figure 3-1: The proposed transmission line and major river crossing sites

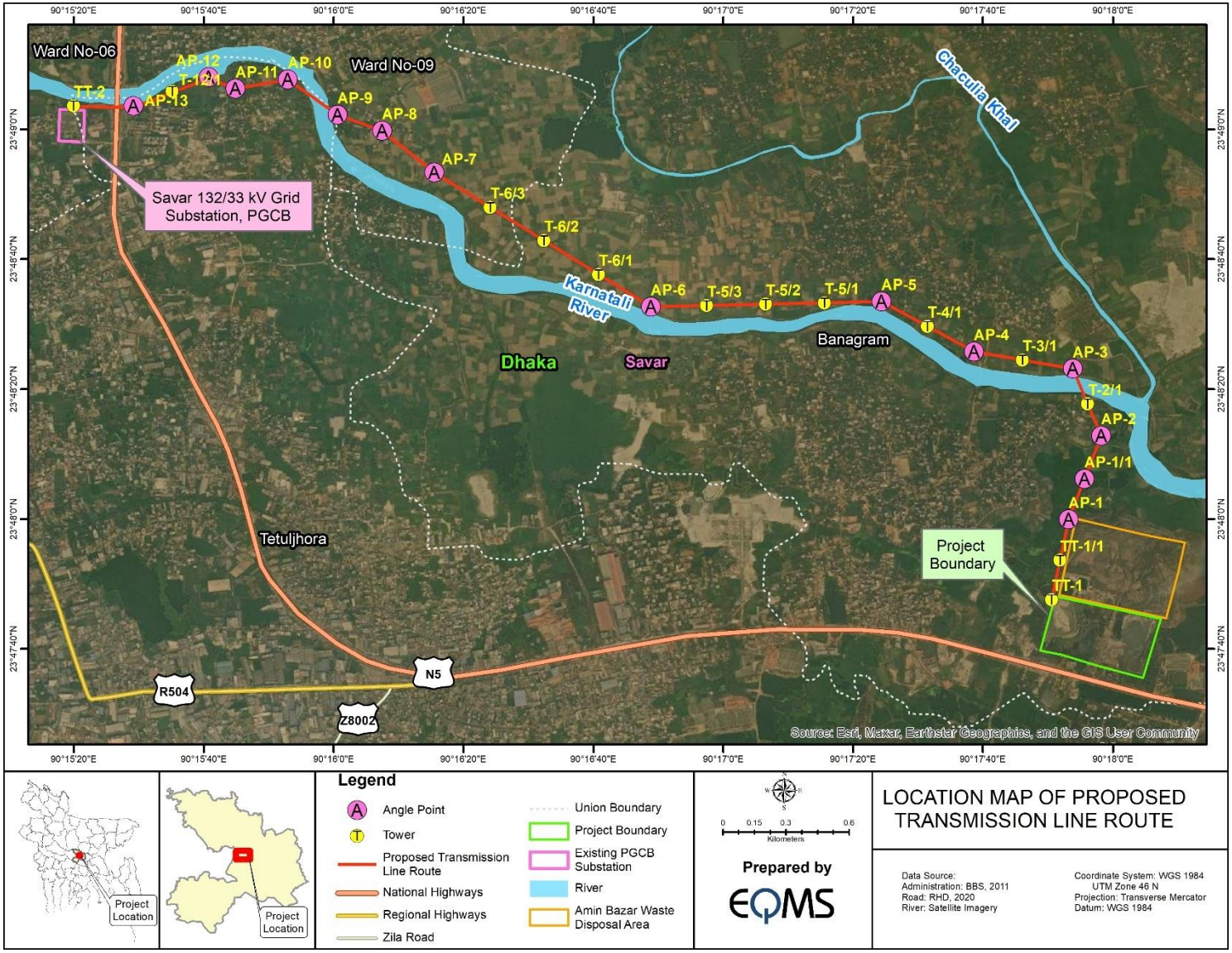


Table 3-1: Detailed Specifications of Transmission Line

Row	Tower Number	X Easting (m)	Y Northing (m)	RL (m)	Ahead Span (m)	Line Angle (deg)	Tower Type	Struct. Height (m)	Footprint Length (m)	Footprint Width (m)	Footprint Area (dec)
1	TT-1	224614.51	2634325.43	6.93			1DT6-S	41.5	11.32	9.73	2.722
2	TT-1/1	224654.36	2634511.35	6.74	190.14		1DL+9	38.04	6.65	5.77	0.948
3	AP-1	224695.50	2634703.33	5.95	196.34	8.6948	1D1+9	38.04	7.675	6.475	1.228
4	AP-1/1	224767.97	2634894.20	2.96	204.16		1DL+9	38.04	7.675	6.475	1.228
5	AP-2	224845.23	2635097.68	4.20	217.66	-41.0833	1DT6+9	37.6	11.77	10.18	2.961
6	T-2/1	224789.06	2635249.58	4.26	161.95		1D1+12	41.04	8.8	7.6	1.653
7	AP-3	224727.13	2635417.08	4.00	178.58	-57.8757	1DT6+9	37.6	12.67	11.08	3.469
8	T-3/1	224508.54	2635462.87	4.46	223.34		1DL+9	38.04	6.65	5.77	0.948
9	AP-4	224298.22	2635506.94	4.12	214.89	19.7232	1D25+9	38.08	9.41	8.13	1.891
10	T-4/1	224097.13	2635630.43	3.84	235.98		1DL+9	38.04	6.65	5.77	0.948
11	AP-5	223899.63	2635751.72	4.07	231.77	-31.8822	1DT6+9	37.6	11.77	10.18	2.961
12	T-5/1	223650.16	2635750.30	3.60	249.48		1DL+9	38.04	6.65	5.77	0.948
13	T-5/2	223393.68	2635748.83	4.73	256.49		1DL+9	38.04	6.65	5.77	0.948
14	T-5/3	223136.6	2635747.37	4.48	257.03		1DL+9	38.04	6.65	5.77	0.948

Row	Tower Number	X Easting (m)	Y Northing (m)	RL (m)	Ahead Span (m)	Line Angle (deg)	Tower Type	Struct. Height (m)	Footprint Length (m)	Footprint Width (m)	Footprint Area (dec)
		5									
15	AP-6	222893.27	2635745.98	4.21	243.39	35.3639	1DT6+9	37.6	12.67	11.08	3.469
16	T-6/1	222668.14	2635903.84	4.72	274.96		1DL+9	38.04	7.11	6.22	1.093
17	T-6/2	222432.80	2636068.85	4.76	287.42		1DL+9	38.04	6.65	5.77	0.948
18	T-6/3	222201.90	2636230.75	4.83	282.01		1DL+9	38.04	7.11	6.22	1.093
19	AP-7	221960.19	2636400.23	4.94	295.21	7.1099	1D1+9	38.04	8.35	7.15	1.475
20	AP-8	221736.68	2636602.52	5.34	301.46	-19.7118	1D25+9	38.08	10.31	9.03	2.301
21	AP-9	221544.11	2636682.03	7.20	208.34	16.3522	1D25+3	32.08	9.41	8.13	1.891
22	AP-10	221330.86	2636853.41	5.34	273.58	-48.5981	1DT6+9	37.6	11.995	10.405	3.084
23	AP-11	221101.74	2636813.79	5.27	232.52	35.791	1DT6+9	37.6	12.67	11.08	3.469
24	AP-12	220985.92	2636870.23	5.00	128.84	-47.3755	1QT6+9	50.1	26.33	20.19	13.137
25	T-12/1	220825.37	2636807.33	5.73	172.43		1QL+9.0	51.87	19.31	14.72	7.024
26	AP-13	220654.50	2636740.38	7.40	183.52	23.0318	1QT6+9	50.1	26.33	20.19	13.137
27	TT-2	220394.45	2636747.81	6.14	260.16	-68.0464	1QT6T+9.0(AUX)	51.1	26.33	20.19	13.137

Row	Tower Number	X Easting (m)	Y Northing (m)	RL (m)	Ahead Span (m)	Line Angle (deg)	Tower Type	Struct. Height (m)	Footprint Length (m)	Footprint Width (m)	Footprint Area (dec)
28	Savar Gantry	220381.07	2636717.17	8.90	33.43		Gantry 132kV E0+0	20			0.000
											89.063

Source: Feasibility Study

4 ENVIRONMENTAL AND SOCIAL ISSUES AND MITIGATION MEASURES

Considering the activities envisaged under the Project and the environmental and social setting of Bangladesh the potential environmental and social issues are discussed in the sections below. The potential mitigation measures to manage these issues/ impacts are also discussed.

4.1 Baseline Environment at the National Level and Project Level

4.1.1 Climate and Meteorology

The climate of Bangladesh is heavily influenced by the Asiatic monsoon. The monsoonal influence results in three distinct seasons:

- Pre-monsoon hot season (from March to May).
- Rainy monsoon season (from June to September); and
- Cool dry winter season (from October to February).

Bangladesh is in the tropical monsoon region, and its climate is characterized by high temperatures, heavy rainfall, often excessive humidity, and fairly marked seasonal variations. From a climatic point of view, three distinct seasons can be recognized in Bangladesh - the cool dry season from November through February, the pre-monsoon hot season from March through May, and the rainy monsoon season which lasts from June through September. January is the coolest month, with temperatures averaging near 26°C, and April is the warmest, with temperatures from 33 to 36°C. Most places receive more than 1,525 mm of rain a year, and areas near the hills receive 5,080 mm per year. Most rains occur during the monsoon (June-September), and little occurs in winter (November-February). Moderate rains are also reported in March, April, and October. The Bangladesh Meteorological Department monitors different climate components in 35 weather stations in Bangladesh. The climatic data for the study area were obtained from the meteorological station located in Dhaka and maintained by the Bangladesh Meteorological Department (BMD).

4.1.2 Geology

The geology profile of Bangladesh is reflective of the country’s location, as Bangladesh is a riverine country. The geological evolution of Bangladesh is related to the uplift of the Himalayan mountains and the outbuilding of deltaic landmass by major River systems having their origin in the uplifted Himalayas. This geology is mostly characterized by the rapid subsidence and filling of a basin in which a huge thickness of deltaic sediments was deposited as a mega delta built out and progressed towards the south. The floodplains of the Ganges, the Brahmaputra (Jamuna) and the Meghna Rivers cover approximately 40% of Bangladesh. The project area covers the geology type named Alluvial silt and clay.

4.1.3 Topography

Topographically, Bangladesh is primarily divided into alluvial plains and hilly areas. Over 90 percent of the country's total area consists of lowlands, forming an alluvial plain created by the sediments of several major rivers along with their tributaries and distributaries that traverse the nation. However, there are local variations in the nature and extent of this plain land, with low hills present in the northeastern extremities of Bangladesh. In terms of physiography, Bangladesh can be categorized into three distinct regions: (a) floodplains, (b) terraces, and (c) hills, each with its unique characteristics. The country's physiography is further divided into 24 sub-regions and 54 units. According to DEM SRTM, 2013, the minimum and maximum spot height of the project area are 4.1 meters and 8 meters respectively.

4.1.4 Soil Quality and Agro-ecological Zone

The Soil Resource Development Institute (SRDI) has identified about 500 soil series in Bangladesh which are further classified into 23 broad types[1].

A major part of Bangladesh is on the delta formed by the three major rivers Brahmaputra, Ganges, and Meghna. Jamuna Karatoya Bengali and Lakhya Floodplain are the soil types of the project area. Non-calcareous Alluvium Similar to calcareous alluvium, except they are non-calcareous in soil profiles. These soils occupy extensive areas on the active Tista and Brahmaputra-Jamuna floodplains. They are sandy or silty, grey, or olive, neutral to slightly alkaline. Most of these soils have been included as Eutric Fluvisols.

Agroecological zones (AEZ) are defined by the soil composition, landform, and climatic conditions. The Parameters of AEZs are the basic climatic and edaphic requirements of crops. There are 30 AEZs in Bangladesh[2].

4.1.5 Natural Hazards

Bangladesh is highly disaster-prone and throughout its existence has been shaped by the impact of both extensive (low-severity, high-frequency events) and intensive (high-severity, mid-frequency to low-frequency events) natural hazards. Also, Bangladesh is one of the countries in the world most at risk from the negative impacts of climate change including increases in the incidence and intensity of extreme weather events and hazards such as soil salinization, rising sea levels, and riverbank erosion.

Flood: Flood is an annual phenomenon in Bangladesh. Normally, the most severe flood occurs in Bangladesh during July and August. Regular river floods (during monsoon season) affect 20% of the country, which may increase up to 67% in extreme years like the 1998 flood. The country has a long history of destructive flooding that has had very adverse impacts on lives and property. In the 19th century, six major floods were recorded: 1842, 1858, 1871, 1875, 1885 and 1892. Eighteen major floods occurred in the 20th century. Those of 1951, 1987, 1988 and 1998 were of catastrophic consequence. More recent floods include 2004 and 2010. Floods also occurred in 2015 and 2017. The project site is situated in a both not flood prone and low river flooding area. Discussion with the local people it became evident that the lower area beside the highway becomes inundated for short periods sometimes in the rainy season.

Cyclone: Devastating cyclones hit the coastal areas of Bangladesh almost every year usually accompanied by high-speed winds, sometimes reaching 250 km/hr. or more and 3-10m high waves, causing extensive damage to life, property, and livestock. Because of the funnel-shaped coast, Bangladesh repeatedly becomes the landing ground of cyclones formed in the Bay of Bengal. The project area is not prone to cyclones. These cyclones occur in two seasons, April-May, and October-November – i.e., before and after the monsoon. The project area lies under no risk of the cyclone area of Bangladesh.

Earthquake: Bangladesh can be affected by moderate to strong earthquake events due to its proximity to the collision boundary of the Northeast moving Indian plate and Eurasian Plate. Strong historical earthquakes with magnitude greater than 7.0 have affected parts of Bangladesh in the last 150 years, some of them had their epicenters within the country. As per the Seismic Zoning Map of Bangladesh, the county is divided into four seismic zones. The Project site falls in the Zone–II area, with a basic seismic coefficient of 0.5g and at low risk of earthquakes. No major earthquake has been reported in

[1] FAO, Land resources appraisal of Bangladesh for agricultural development, Vol 2, Rome, 1988; FAO/ UNDP, Classification of the soils of Bangladesh, 1986; H Brammer, The Geography of the Soils of Bangladesh, UPL, Dhaka, 1996.

[2] FAO/UNDP, Land Resources Appraisal of Bangladesh for Agricultural Development Report 2: Agroecological Regions of Bangladesh, FAO/UNDP, 1988; Bangladesh Bureau of Statistics, 1998 Yearbook of Agricultural Statistics, BBS, Dhaka, 1999.

the project area in recent years or in the recent past. Earthquakes in Bangladesh are frequent and often cause damage. The earthquakes occur due to a convergent boundary between the Indian Plate and the Eurasian Plate.

4.1.6 Water Environment

Bangladesh has around 310 rivers with a total length of 24,140 km. Among them, 54 rivers originate from India, all of which eventually flow into the Bay of Bengal. These include three major rivers, the Ganges, the Brahmaputra (Jamuna), and the Meghna, which together constitute the largest river network in the world. These rivers carry 2.0 billion tons of sediments annually from India and Nepal to the Bay of Bengal[3].

The Karnatali River has been considered for the nearby surface water sources and their water availability has been studied based on the flow model and the environmental flow requirement in both dry and monsoon season. Surface water availability for this river was expressed in terms of monthly average and dependable flow. The Weibull formula has been used for the estimation of dependable flow for each month.

Based on the last 30-years data analysis, mean monthly flow ranges 1.2 – 3.4 m^3/s from January to April, 16.4 – 81.2 m^3/s from May to June, 233.2-138.0 m^3/s from July to October and 28.3 – 6.0 m^3/s November to December. Monsoon season environmental flow has been found to be minimum 59,040 m^3/hr and in the dry season flow rates have been found to be minimum 4,320 m^3/hr, which meets the requirement of both environmental and industrial water usage of the study area.

The proposed RoW of transmission line falls under savar upazila, located near Dhaka in Bangladesh, experiences significant challenges with groundwater depth. Over the years, extensive groundwater extraction for agricultural, industrial, and domestic use has led to a notable decline in water levels. As per consultation with the local communities, the average groundwater depth for drinking water is approximately 200ft-250ft. The water quality is very good. However, they are not experiencing any significant presence of arsenic, iron, or fluoride in the groundwater.

4.1.7 Ecological Environment

The total area of forest land in Bangladesh is about 2.6 million hectares (Table 4-1). Out of which 1.6 million hectares are under the control of the Forest Department (FD). Unclassed State Forests (USF) extending over an area of 0.73 million hectares were until recently under the control of the Deputy Commissioners and now have been placed under the control of District Councils. However, tree cover in forest land amounts to only 6.7%. The per capita forest area in Bangladesh is less than 0.015 hectares against the world average of 0.60 hectares[4].

Table 4-1: Distribution of major forest types in Bangladesh

Forest Type	Location	Area (million hectares)	Remarks
Hill Forest	The eastern part extending over Sylhet, Habiganj, CHT, Chittagong and Cox's Bazar	0.67	Under the control of FD. Major produce: large saw logs, poles, firewood, thatching material, and bamboo.

[3] Imamul Huq et. al. "Sustainable Management and Protection of Soil Resources".

[4] Bangladesh National Conservation Strategy (https://bforest.portal.gov.bd/sites/default/files/files/bforest.portal.gov.bd/notices/c3379d22 ee62_4dec 9e29_75171074d885/4.%20Forest%20resources_NCS.pdf)

Forest Type	Location	Area (million hectares)	Remarks
Natural Mangrove (Sundarban)	South-West in Khulan, Bagerhat and Satkhira	0.60	Includes 0.17 million ha water area; Major produce: timber, poles, firewood, pulpwood, thatching material
Mangrove afforestation	Along the Coastal zone	0.19	Major produce: firewood, pulpwood.
Sal Forest	Chiefly in the Central region of Gazipur, Tangail, Comilla, Sherpur, and Mymensingh. Small patches were also found to occur in Dinajpur, Rangpur, Thakurgaon, Naogaon and Panchagarh in the north-western region	0.12	Indigenous Sal and plantation of short rotation exotics for poles, posts, and firewood.
Un-classed State Forests (USF)	Mainly in Sylhet and Sunamganj district in the north-eastern part	0.73	Under the control of district councils subject to shifting cultivation. Major produce: bamboo, thatching material, and firewood.
Swamp Forest	Mainly in Sylhet and Sunamganj district in the north-eastern part	0.02	Hijal (Barringtoniaacutangula) and Koroch (Pongamiapinnata) are the main species of the forest. The swamp forests support freshwater fisheries and are vital spawning grounds.
Village Forests	Scattered throughout the country mostly on the homestead land	0.27	Almost all of the village area (2.86 million ha) is covered by trees of varying density. Major produce: timber, bamboo, poles, posts, and firewood.

Source: Forest Department 2016 (www.bforest.gov.bd); NFA, 2007.

Protected areas (PAs) in Bangladesh cover 267,330.75 hectares or nearly two percent of the country's total area. These include 17 declared national parks, 17 wildlife sanctuaries, and one special biodiversity conservation area. In addition, there are dolphin sanctuaries Swatch of No Man Land Marine Protected Area, and Vulture Save Zones.

There are 19 Important Bird and Biodiversity Areas (IBAs) in Bangladesh. Among these, II IBAS support globally threatened species, 10 IBAS have biome-restricted species and nine qualify as IBAS because they hold large congregations of water birds. Ten IBAs (53%) contain examples of terrestrial forest ecosystems, which together cover all significant areas of forest known to remain in Bangladesh. They include the Indo-Malayan tropical dry forests in Madhupur National Park (IBA 1) to the north of Dhaka, three IBAS in north-eastern Bangladesh where Indochinese tropical moist forest is the dominant biome, and six IBAS in the Chittagong hill tracts in the south-east of the country, where Indochinese tropical moist forest and Sino-Himalayan subtropical forest are the main habitats. Five IBAS contain freshwater ecosystems and some also have remnants of natural grassland. Tanguar Haor (IBA 2) and Hakaluki Haor (IBA 4) in north-east Bangladesh are outstanding because of their breeding population of Pallas's Fish-eagle and for their large wintering concentrations of waterbirds, including Baer's Pochard. Coastal ecosystems are represented at five IBAs. The intertidal mud and sand flats of the Ganges-Brahmaputra-Meghna delta (IBA 11) IBA support the largest known concentrations of Spotted Greenshank, Spoon-

billed Sandpiper, and Indian Skimmer in the world. The Sundarbans (IBA 10) is globally outstanding for its vast mangrove forests and associated intertidal wetlands[5].

4.1.8 Socio-Economic Environment

The identified Transmission Line for the Waste to Energy project falls into the Savar Upazila of Dhaka District. Based on the environmental & social influence of the project, a 500 m radius along the proposed transmission line route is considered the study area for the social study.

According to the 2011 Bangladesh census, Savar Upazila had 359,084 households and a population of 1,385,910. 243,262 (17.55%) were under 10 years of age. Savar had a literacy rate (age 7 and over) of 68.0%, compared to the national average of 51.8%, and a sex ratio of 876 females per 1000 males. 296,851 (21.42%) lived in urban areas.

The religious breakdown was Muslim 93.86%, Hindu 5.35%, Christian 0.58%, Buddhist 0.20%, others 0.01%, and ethnic minority group nationals numbered 319 including Buno, Garo, Chakma (Sangma), and Burman. The main occupations are Agriculture 24.34%, agricultural labourer 12.84%, wage labourer 4.44%, cattle breeding, forestry and fishing 1.90%, industry 1.37%, commerce 17.35%, service 20.68%, construction 1.66%, transport 3.96% and others 11.46%.

Agriculture and manufacturing are the two major economic sectors in Savar. The main crops grown here are Paddy, Jute, peanut, onion, garlic, chili, and other vegetables. The extinct or nearly extinct crops in the region are Aus paddy, Asha Kumari paddy, sesame, linseed, kali mator, randhuni saj, mitha saj, kaun, and mas kalai. The main fruits cultivated here are Jackfruit, mango, olive, papaya, guava, kamranga, berry, and banana. There are 181 combined fisheries, dairies, poultries, five hatcheries, 209 poultries, and 1319 fisheries. Manufacturing facilities include Ceramic industry, beverage industry, press and publication, garments industry, foot ware, jute mills, textile mills, printing and dyeing factory, transformer industry, automobile industry, biscuit and bread factory, pharmaceutical industry, soap factory, brickfield, cold storage, welding, plant nursery, etc. The minimum wage is approximately $9.50 per week or $38 per month.

There is 62 km of pucca (first-class), 56 km of semi pucca, 562 km of mud road, and 50 km of highway. The transport used here include the traditional (and extinct or nearly extinct) Palanquin, bullock cart, horse carriage, and modern-day vehicles.[6]

4.2 Environmental Issues

In this section, key environmental and social issues associated with the installation of transmission lines are discussed. The corresponding preventive and/ or mitigation measures are designed to apply the principle of mitigation hierarchy. "Avoid, Minimise, Mitigate, and Offset".

4.2.1 Soil

Impact due to Disturbance to Soil

4.2.1.1 Potential Impact

Impact on soil may occur due to the construction of the transmission tower. In the case of transmission lines, the erection of tower may result in:

- **Soil Mixing:** The excavation depth for tower foundations varies depending on the type of soil. Some of the excavated soil is backfilled but there may still be some leftover excavated material. Excavated material is primarily subsoils if mixed with top-soils can reduce the fertility of soil.

[5] http://datazone.birdlife.org/userfilesfflle/lBAs/AsiaCntryPDFs/Bangladesh.pdf

[6] https://en.wikipedia.org/wiki/Savar_Upazila

- **Erosion:** The excavation for the tower foundation would expose the soil. Thus the tower construction would aggravate the problem of erosion. This would result in sedimentation in the adjoining fields.
- **Compaction:** The movement of vehicles over the agricultural land to access the construction site would also cause compaction of soil and affect soil fertility.

4.2.1.2 Mitigation Measures

Mitigation measures that would be considered to reduce impacts on soil during the construction of transmission lines are given below:

- Excess excavated material from tower footing has to be removed by the contractor before completion of construction. The excess excavated material may be used for repairing bunds of the agricultural fields or for strengthening of shoulders of village roads.
- Siting of the transmission tower should avoid a waterlogged/steep sloped site. In case such sites are selected, the cut and fill slopes would be protected using standard engineering practices including bio-engineering techniques wherever feasible.

4.2.2 Emission and Discharges from Construction Activity

4.2.2.1 Potential Impact

During the construction phase of the project, i.e. construction of transmission lines pollution is expected. This would include water pollution from the construction camp and lay down area and fugitive and exhaust air pollution from the movement of vehicles carrying construction material and machinery used during site clearance and leveling of the site, etc.

The fly camps would be developed at different locations for the erection of the towers and stringing. These camps would generate solid and liquid waste. These wastes have the potential to contaminate the soil and the water bodies around the site if it is not properly handled.

During site preparation and construction, the Project is likely to generate dust (as particulates) and there will be times during the construction phase when elevated dust concentrations may occur. Higher amounts of dust will be generated at places where earthwork, cutting, and filling operations take place or in material handling and storage areas. A large percentage of such dust emissions from construction sites have been found to comprise particles that are coarse in size (>10 microns) and have a tendency to settle down within a few hundred meters of the source of emissions. The smaller fractions (PM_{10}) can however be carried over longer distances in a dust cloud, in the case wind velocity is higher and depending on prevailing wind direction may be deposited in the adjoining villages with a potential to cause soiling of residential premises, deposition on agricultural crops, etc. However, this will be a short-term impact lasting for a few months. Particulates, CO, SO_X, NO_x and unburnt hydrocarbons (VOCs) will be emitted by vehicles, batching plants (if used), heavy equipment, and DG sets associated with site clearing and construction activities. The operational phase will not have any specific source contributing to air emissions.

Noise and vibration at the transmission line development site are expected to be primarily generated during the site preparation and construction phases of the project. Such noise may be generated from the operation of construction equipment and machinery and the transportation of equipment and materials. The operation of earth-moving machinery has the potential to generate high noise levels. These machineries produce noise levels of more than 70 dB (A). This can cause disturbance to the settlement if located near (within 500 m) transmission lines.

4.2.2.2 Mitigation Measures

Although pollution is not a major issue with this type of Project, still WTE Power Plant North Dhaka Private Limited (WPPNDPL) will make efforts to further minimize it. WPPNDPL would implement

measures stated in the ESMP (which will be prepared as part of the ESIA) for pollution prevention. The ESMP would be made part of the standard bidding document of contractors.

Septic tanks and soak pits/modular bio-toilets would be provided at all the transmission line construction camps and lay-down areas. After the construction activities the construction site would be cleared of all the leftover materials and debris to avoid any chance of pollution.

To prevent air pollution the vehicles carrying construction materials and machinery would try and move along the existing access road. To the extent movement of vehicles through agricultural fields would be discouraged.

4.2.3 Impacts due to Handling of Toxic Chemical and Waste

4.2.3.1 Potential Impacts

Heavy machinery and generators typically use lubricating oil, diesel, or hydraulic oil, depending on the machinery's requirements. Lubricating oil reduces friction and wear, ensuring efficient operation and longevity. Diesel fuels the engines, providing the necessary power, while hydraulic oil enables the transmission of power within hydraulic systems. The use of these oils can have significant environmental impacts, such as oil spills, soil and water contamination, and air pollution due to emissions. Proper handling, storage, and disposal of these oils, along with regular maintenance, are essential to mitigate their adverse effects on the environment and human health.

Similarly, electrical and electronic equipment (EEE) have toxic substances in the components which may cause harm/pose risk to health and the environment during handling after its expiry & full usage.

4.2.3.2 Mitigation Measures

Toxic chemicals and wastes shall be handled as per the following:

Proper Disposal of Transformer Oil:

- Implement safe and scientific disposal methods for Heavy machinery and generators oil to prevent soil and water contamination.
- Use licensed hazardous waste disposal facilities to handle and dispose of transformer oil.

Handling lubricating oil, diesel, or hydraulic oil:

- Regularly monitor and test Heavy machinery and generators oil for lubricating oil, diesel, or hydraulic oil content.
- Phase out the use of lubricating oil, diesel, or hydraulic oil and replace them with environmentally friendly alternatives.
- Employ specialized facilities for the safe disposal and destruction of lubricating oil, diesel, or hydraulic oil.

Managing EEE Waste:

- Establish e-waste recycling programs to safely handle electrical and electronic equipment after their useful life.
- Promote the use of certified e-waste recycling centers to ensure proper dismantling and recycling of toxic components.
- Encourage manufacturers to adopt eco-design principles to reduce the toxicity of components in new products.

Regulatory Compliance:

- Adhere to national and international regulations regarding the disposal of hazardous materials and e-waste.
- Implement strict monitoring and enforcement mechanisms to ensure compliance.

4.2.4 Emission of Green House Gas (GHG)

4.2.4.1 Potential Impact

Construction machinery and equipment, such as excavators, bulldozers, cranes, and generators, typically run on diesel or gasoline, can result in increased emissions of CO2 and other GHG emissions. Additionally, the manufacturing of transmission line materials, such as steel and concrete, can produce significant greenhouse gas emissions. Maintenance activities and energy losses during transmission also contribute to greenhouse gas emissions.

4.2.4.2 Mitigation Measures

Employ energy-efficient machinery and vehicles, adopt idle reduction policies, and use alternative fuels when possible. Utilize recycled materials, source materials locally to minimize transportation emissions, and implement low-carbon production technologies. Adopt efficient transmission technologies to minimize energy loss, conduct regular maintenance for optimal operation, and integrate renewable energy sources into the grid.

4.2.5 Water Resource

4.2.5.1 Potential Impacts

Water resourcing requirements for transmission line projects are minimal, as there is no process or activities that require a steady supply of water. The water requirement during the construction phase is expected to be more intense. The project would depend on the extraction of groundwater resources, using existing bore wells (wherever available).

4.2.5.2 Mitigation Measures

Groundwater usage for construction work would be reduced by adopting the following best practices:

- Use buckets etc. to wash tools instead of using running water.
- Use of auto shut-off taps in labor accommodation.
- Install water meters with main supply pipes/water tanks/bore well to assess the quantity of consumed water and
- Use of admixture in concrete production to reduce water consumption.

4.2.6 Occupational Health and Safety

4.2.6.1 Potential Impact

Safety issues related to the construction work of the transmission line may involve physical hazards like working at height, exposure to heat, particulate matter, noise and vibration, collision with vehicles/ moving equipment; exposure to electrical hazards; exposure to chemicals hazards (both inhalation and physical contact) like organic solvent vapors, reactive and toxic chemicals (acid, bases, insecticides, etc.). Such occupation hazards would vary with the nature of work undertaken by the workmen, as they may employed by different contractors responsible for doing a particular component of the work.

The construction work would involve several contractors who in turn would engage different laborers having varied skill sets. The duration and extent for most workmen is expected to extend for a few months and the occurrence of any accidents and consequent injuries/fatalities will lead to adverse impacts that could range from loss of productive time to loss of livelihoods (of workmen). If local workers are hired, they may not have appropriate training for adopting a safety culture expected at an industrial construction site — so receptor sensitivity may be anticipated to be high. There is also a possibility of legal non-compliance, which may lead to temporary stoppage of work affecting construction schedules.

4.2.6.2 Mitigation Measures

To mitigate safety issues during transmission line construction, employ comprehensive safety training for all workers, emphasizing hazard awareness and safe work practices. Use energy-efficient machinery, enforce idle reduction policies, and adopt alternative fuels to minimize emissions. Ensure contractors and laborers are equipped with proper protective equipment (PPE) and are trained in handling physical hazards such as heights, heat, particulate matter, noise, and vibration. Implement strict protocols for managing electrical and chemical hazards, including safe handling and disposal of substances like lubricating oil, diesel, or hydraulic oil. Regularly monitor air quality and ensure well-ventilated workspaces to prevent risks from gases like SOx, NOx. Establish emergency response plans and ensure compliance with safety regulations to prevent accidents and legal issues, maintaining construction schedules and safeguarding workers' health and livelihoods. The project company will arrange accommodation, food, sanitation & health facilities for workers.

4.2.7 Community Health and Safety

4.2.7.1 Potential Impact

Excavation for Tower Footings for Transmission Lines: During the construction of the foundation for the tower footing, the excavation can pose potential safety concerns for the inhabitants of the locality. This would be more relevant when the construction is carried out near a settlement or along a foot track or existing village road.

Interference with utilities and traffic: The stringing of the transmission line would cross several roads. During the stringing operations when transmission lines cross any road, hindrance may be caused to the movement of traffic. In some instances, temporary closure of the road may be required to facilitate stringing activities. This disruption in movement would cause inconvenience to the local population as access would be interrupted temporarily.

Changes in Environmental Conditions: Changes in baseline environmental conditions can be experienced by the local community in terms of increased nuisance levels from emissions of dust, contamination of surface water or groundwater, and high noise levels during the construction phases. Even though there would be minimal increase in dust and noise during the construction period this has the potential to lead to health impacts associated with eye irritation and general disturbance to daily activities.

Increased Prevalence of Disease: The influx of workers to the community may cause impacts on public health, especially an increase in the prevalence of diseases as well as pressures on existing health infrastructure. In addition, vector-borne diseases would pose a risk to settlements closer to campsites for the construction phase labor, particularly due to the lack of hygienic conditions. However, the labour camp would be constructed near the construction site and would preferably be kept away from the settlement area.

4.2.7.2 Mitigation Measures

- During the construction phase, the entire excavated area shall be barricaded. To facilitate easy identification of these areas during the night, reflective tapes would be placed on the boundary so that the people can be easily warned.
- Schedule stringing operations during off-peak hours, provide alternative routes, and ensure timely communication with local authorities and the community to minimize disruptions and inconvenience.
- When a transmission line crosses any road, adequate care/caution should be taken so as not to cause any hindrance to the movement of traffic. Stringing at the construction stage would be carried out during the lean traffic period in consultation with the administrative department and local office of the utilities.

- Implement dust suppression techniques, proper waste management, and noise control measures to reduce emissions and contamination, ensuring minimal health impacts and disturbance to the local community.
- To prevent an increased prevalence of disease due to an influx of workers, strict hygiene protocols and health monitoring should be enforced at labor camps, with adequate healthcare facilities provided to manage any potential health impacts on both workers and nearby residents.
- The contractor may take permission from LGED, RHD, BIWTA due to crossing the Local Roads, Highway and River.

4.3 Social Issues

4.3.1 Structure, Standing Crop and Trees

4.3.1.1 Potential Impact

Damage to the Standing Crop and Loss of Trees

The proposed transmission line will require approximately 89.063 decimals (0.89 acres) of land for tower footing construction. Most of this land is privately owned and currently used for cultivating various crops, including paddy, chili, brinjal, bottle gourd, snake gourd, pumpkin, water pumpkin, sugarcane, red spinach, and water spinach seeds. Additionally, approximately 50 trees of various sizes are found within the right-of-way of the transmission line. Construction of the transmission line tower foundation, erection of towers and subsequently stringing of lines involve movement of people and small equipment across agricultural fields leading to the tower locations. This may cause potential damage to the standing crops in the agriculture field. Also, loss or damage of trees can take place during stringing. This damage to crops and loss of trees will result in a temporary loss of income for the cultivators.

4.3.1.2 Mitigation Measures

Mitigation measures to reduce the impact of damages to standing crops and loss of trees are given below:

- The landowner can use the land after TL construction without damaging Tower and Its equipment as per Electricity Rules 2020 Section 10, Subsection 6.
- Construction is to be undertaken during the lean agricultural season after the harvests are over.
- Use of village roads and earth bunds between agricultural plots for movement of equipment and workers, wherever possible.
- WPPNDPL will pay full compensation to the affected persons for any damage or inconvenience caused by this project, as per the provisions of the Electricity Rules 2020. For compensation related to crop damage, the Scheduled Rates of the Agricultural Department will be followed. For compensation related to damage to trees, a valuation will be undertaken by the forest department and the derived value will be followed. Compensation for the damage should be paid before the construction work.

4.3.2 Loss of Land

4.3.2.1 Potential Impact

Restriction on Land Use

The proposed transmission line will require approximately 89.063 decimal (0.89 acres) of land for tower footing construction. Most of the land is privately owned land which is currently used for cultivation. During the field survey, it is observed that no households are residing inside the proposed tower footing area. As per the initial field visit, there is no structure found in the proposed land to be acquired for tower footing. So, no physical displacement and relocation is required for this TL. Only economic

displacement will be involved. The tower footings for laying transmission lines require land compensation as per Electricity Rules 2020 even if land for tower footings will not be acquired. Compensation will be provided for standing trees under RoW which require felling before laying the transmission lines.

To facilitate the construction of the transmission line and ensure the supply of electricity to the nearest substation, land procurement is required. This process can lead to substantial social impacts, particularly when it involves the purchase of private agricultural land. The landowners are not only dependent on the cultivation of agricultural land but also, they have other income sources. So due to land purchase the landowner will not be affected much. As per common practice in Bangladesh, once the tower erection is completed, the landowners can use the land for cultivation under the tower footing area. The landowner can use the land after TL construction without damaging Tower and Its equipment as per Electricity Rules 2020 Section 10, Subsection 6.

4.3.2.2 Mitigation Measures

- In the case of private land acquisition, a Resettlement Action Plan (RAP) would be prepared with a Livelihood Restoration Plan (LRP) and the same would be implemented.
- During construction, if any crops, structures or any other assets are affected, will be compensation according to the entitlement proposed in the RP.
- After conducting the market assessment, the proponent will be ensured that the compensation is equivalent to or greater than the Replacement Cost to meet AIIB's ESF guidelines.
- In case private land is procured through negotiated purchase, on a willing buyer and willing seller basis, the minimum price of land would be determined at market price (replacement cost of the land in the same area).

4.3.3 Income Loss

4.3.3.1 Potential Impact

Short-term Income Loss

The installation of the transmission line will primarily affect agricultural fields, impacting both landowners and sharecroppers who rely on their cultivated produce for their livelihoods. The presence of transmission lines on their land will disrupt the cultivation of vegetables and other crops, directly hindering agricultural production. During the construction period, this disruption could lead to a short-term loss of income for those dependent on the land, as their ability to grow and harvest crops will be impeded. This temporary financial setback could have broader implications for their economic stability and overall well-being.

4.3.3.2 Mitigation Measures

In the event of short-term income loss due to the installation of the transmission line, a Resettlement Action Plan (RAP) shall be developed. This plan shall encompass both titleholders and non-titleholders, ensuring that all affected parties are compensated for their income loss during the disruption period. The RAP aims to mitigate the financial impact on landowners and sharecroppers, providing them with the necessary support to manage the temporary interruption in their agricultural activities.

4.3.4 Impact of Labor Influx

4.3.4.1 Potential Impact

It is envisaged that during the construction phase of the project, labor for various jobs such as civil, mechanical, and electrical works will be hired through authorized manpower agencies. Even though the unskilled labor force can be sourced locally, skilled labor required for the project would be primarily migrant labor.

The influx of migrant labor will have both negative and positive impacts on the nearby community and local environment. The labor will be accommodated in a temporary campsite close to the project site, which can have some interface with the nearby community. The influx of migrant workers would lead to a transient increase in population near the project area for a limited time. This may put some pressure on local resources such as roads, fuel wood, water, etc.

Some of the significant issues related to migrant labor would include:

- Conflict amongst workers, and between workers and local community, based on cultural, religious, or behavioral practices.
- Discontent amongst the local community on the engagement of outside workers and laborers.
- Outbreaks of certain infectious diseases.
- Security issues for local women from the migrant workforce.
- Labor camps and associated activities will not be allowed to spill over to the nearby forest areas; and the Use of community facilities such as health centers, transport facilities, etc. by migrant labor may lead to discontent with the local community.

4.3.4.2 Mitigation Measures

To address the potential negative impacts of the influx of migrant labor during the construction phase, several mitigation measures shall be implemented. These include establishing clear communication channels and cultural sensitivity training to reduce conflicts between workers and the local community. Efforts shall be made to engage a portion of the local unskilled workforce to minimize discontent over the employment of outside laborers. Health screenings and medical facilities shall be provided to prevent the outbreak of infectious diseases. Security measures shall be heightened to protect local women and ensure a safe environment for all residents. Temporary labor camps shall be strictly confined to designated areas. Additionally, provisions shall be made to minimize the pressure on local resources, and migrant workers shall be discouraged from overburdening community facilities like health centers and transport services. These measures aim to foster a harmonious relationship between the migrant workforce and the local community, ensuring smooth project execution with minimal social disruption.

4.3.5 Chance finds of archaeological artifacts, treasures, etc. during excavation

4.3.5.1 Potential Impact

For the installation of the transmission line, excavation activities will be conducted on agricultural land. During this process, there is a possibility of unexpectedly discovering archaeological artifacts, treasures, or other significant historical items. These "chance finds" could emerge as the ground is disturbed, revealing remnants of past civilizations or valuable objects that have long been buried. Such discoveries could provide important insights into the history and culture of the area, adding an element of historical preservation to the construction project.

4.3.5.2 Mitigation Measures

To address potential discoveries of archaeological artifacts during the excavation for the tower of transmission line, a set of mitigation measures shall be implemented. A "Chance Finds Procedure" shall be established, requiring immediate cessation of work and site security if artifacts are found. Training sessions shall educate construction personnel on recognizing and reporting potential finds. A qualified archaeologist shall be on call to assess and manage any discoveries, coordinating with local heritage authorities. Prior coordination with these authorities shall ensure clear communication for reporting findings. All discoveries shall be documented and reported, with construction plans adjusted as necessary to protect significant sites. These measures will ensure responsible handling of archaeological finds, preserving historical insights while minimizing construction disruptions.

4.3.6 Women Work Participation and Decision Making

4.3.6.1 Potential Impacts

In Bangladesh, the participation rate of women in the workforce stood at 42.68% in the year 2022[7]. This statistic underscores the continued challenge of achieving gender parity in labor force participation. Despite progress in various sectors, the figure highlights that female participation in the workforce is progressing.

4.3.6.2 Mitigation Measures

To ensure the involvement of women, both formal and informal group consultations shall be conducted to guarantee their participation throughout the project implementation. Specifically for female labor employed at construction sites, dedicated arrangements such as separate accommodations, toilet facilities and rest areas shall be provided. Additionally, strict measures shall be taken to prevent any form of discrimination between male and female workers.

[7] https://www.tbsnews.net/economy/unemployment-drops-36-increased-womens-participation-607726

5 ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK

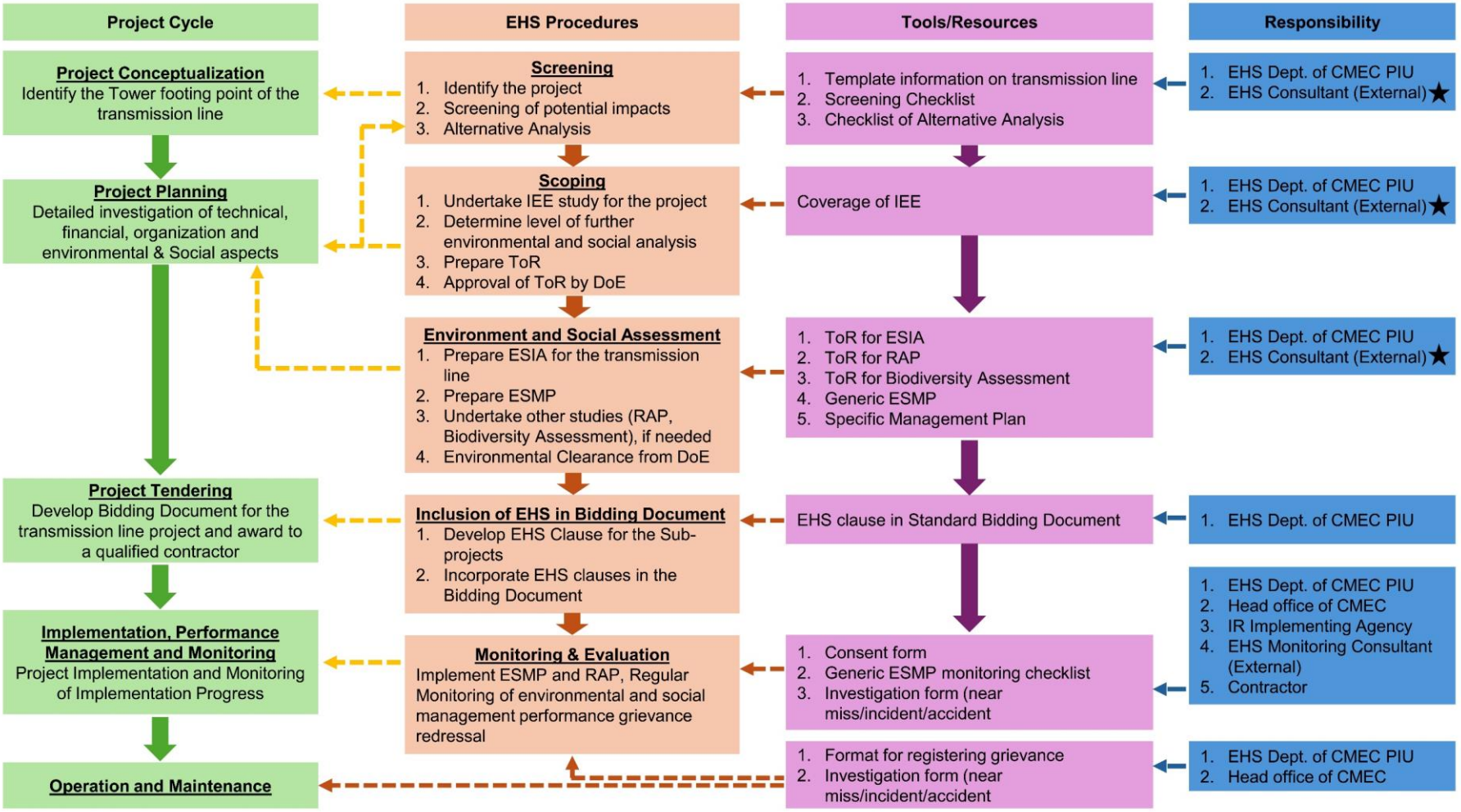
5.1 Introduction

The ESMF aims to assist WPPNDPL in identifying and managing the environmental and social impacts through appropriate mitigation measures that may arise due to the installation of the transmission lines. The successful implementation of the ESMF will depend on the commitment of the WPPNDPL and appropriate institutional arrangements in the WPPNDPL. It also requires that the development cycle of the transmission line project align with environmental and social assessment procedures to ensure that there is early engagement between project planners and compliance staff responsible for environmental and social management. This approach will ensure that the material risks and impacts are identified at the planning stages of the project development cycle, thus ensuring that environmental and social studies are appropriately scoped.

Many aspects of the ESMP prepared for the main project of construction of WtE Plant would also be applicable for Transmission Line (e.g. facilities to be provided in labor camps, GRM, etc.). It would, therefore, be desirable to initially state that various measures identified in the ESMP for the Plant will also be applied to TL sub-project, as may be relevant.

Figure 5-1 provides a schematic of the ESMF showing the linkages between project development and environmental and social impact assessment procedures. It highlights the tools that are contained in the ESMF. These various elements of the ESMF are elaborated upon in this section.

Figure 5-1: Schematic of the ESMF



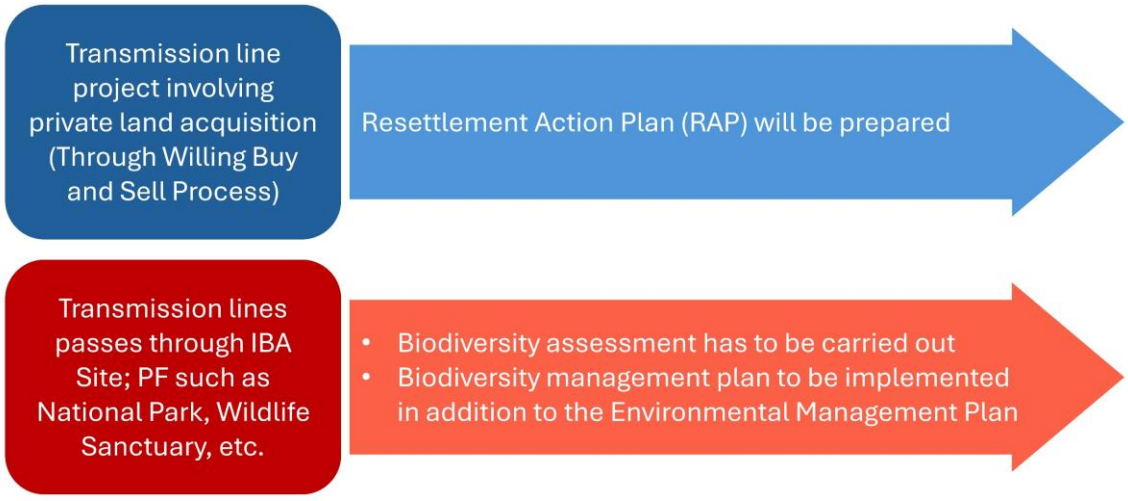
★ Services of the E&S Consultant can be considered in case it is required by WPPNDPL/CMEC

5.2 Project Development Cycle

Project Conceptualization: At the outset, WPPNDPL will identify project options and alternatives to align with its vision and goal. The exercise will culminate in a project brief that includes a project concept paper, which should take account of environmental and social constraints and opportunities. WPPNDPL will identify the activities of the project, prepare project descriptions, undertake environmental and social screening and analysis of alternatives.

Project Planning: After internal approval of the project, WPPNDPL will proceed with feasibility studies for the best alternatives. This phase generally involves desktop investigation of design, technical, financial, and environmental and social issues pertaining to the transmission line installation project, followed by detailed site investigation.

In this stage, WPPNDPL will undertake IEE studies for the transmission line project, determine the level of environment and social analyses that will be required for respective project. Further, at this stage, through IEE, WPPNDPL will ascertain the requirement of any specialised studies (e.g., Environmental and Social Impact Assessment (ESIA), Resettlement Plan and Biodiversity Assessment). Based on the Lender's requirements in the further stage the ESIA and RAP studies will be conducted.



Considering the scope of studies for the transmission line project, baseline information would be collected from surveys, field studies and secondary sources. This baseline information would be utilized for carrying out the Environmental and Social Impact Assessment and for the preparation of the Environmental and Social Management Plan.

Resettlement Action Plan: In case of private land acquisition (Willing Buy and Selling Process), a Resettlement Action Plan (RAP) would be prepared with Livelihood Restoration Plan (LRP). The plan would identify all people affected by the project and justify their displacement after consideration of alternatives that would avoid or minimize displacement. It would also present the entitlements for each of the project affected persons. As estimation of the quantum of impact on land (by different land use) along with an estimate of the number of people likely to be affected would be prepared as part of the RAP.

Biodiversity Assessment Study: This study would aim at identifying potential impacts on flora and fauna and to suggest relevant compensatory and mitigation measures to protect/ conserve biodiversity in the areas likely to be impacted along RoW of distribution line due to the project activity.

Technical and financial studies will be conducted in parallel with the ESIAs, necessitating strong linkages between the engineering, finance and assessment teams.

Note: Proposed Project will be considered as "Orange" category Project (Item No 31: Electricity, Oil, and Gas Transmission Line (upto 25 km)) in the ECR 2023. Therefore, it will be required to conduct Initial Environmental Examination (IEE) study for getting Site Clearance and Environmental Clearance from the DoE, Bangladesh. Therefore, IEE shall be conducted in consultation with DoE.

Figure 5-2: DoE environmental clearance applicability and procedure

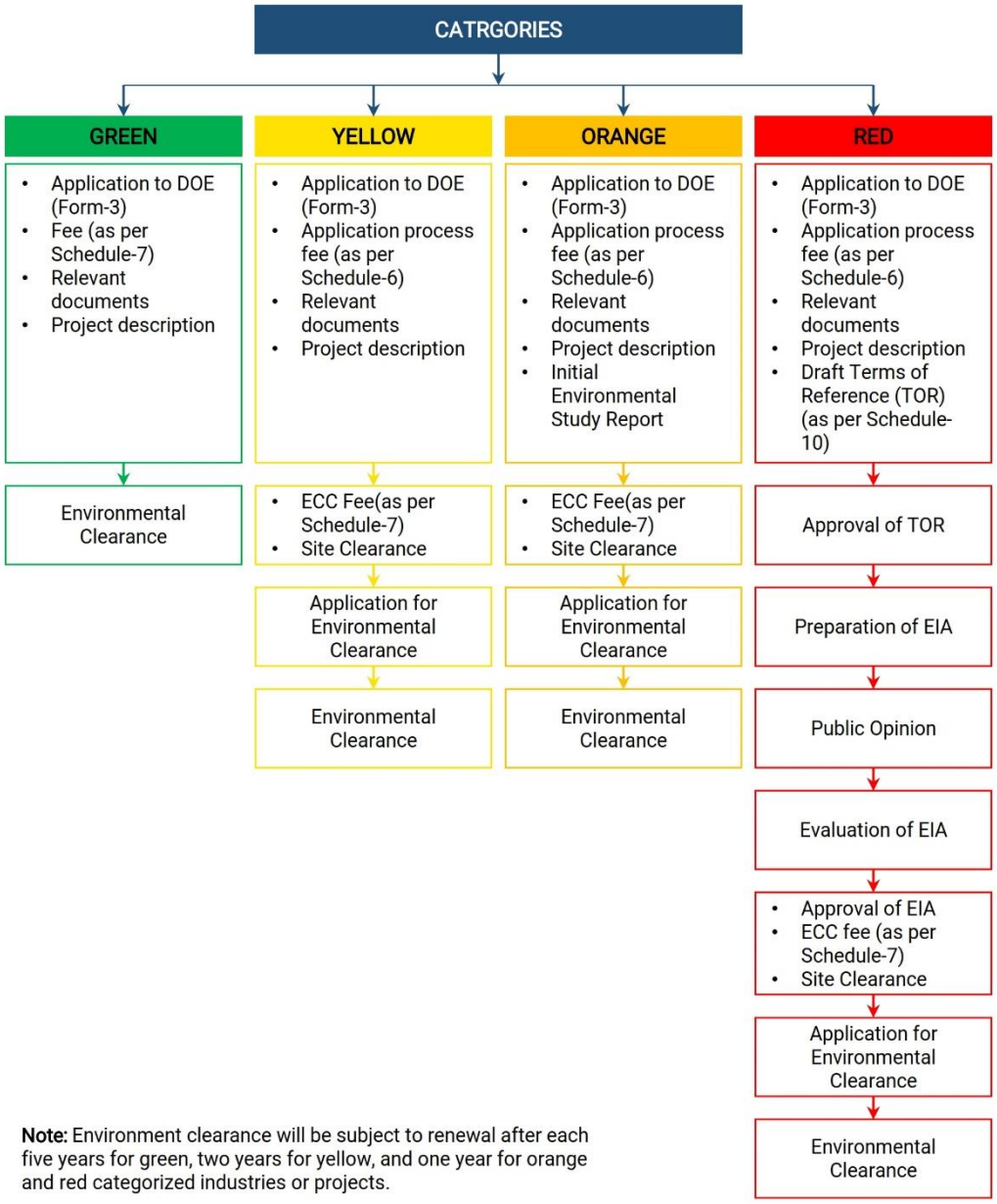
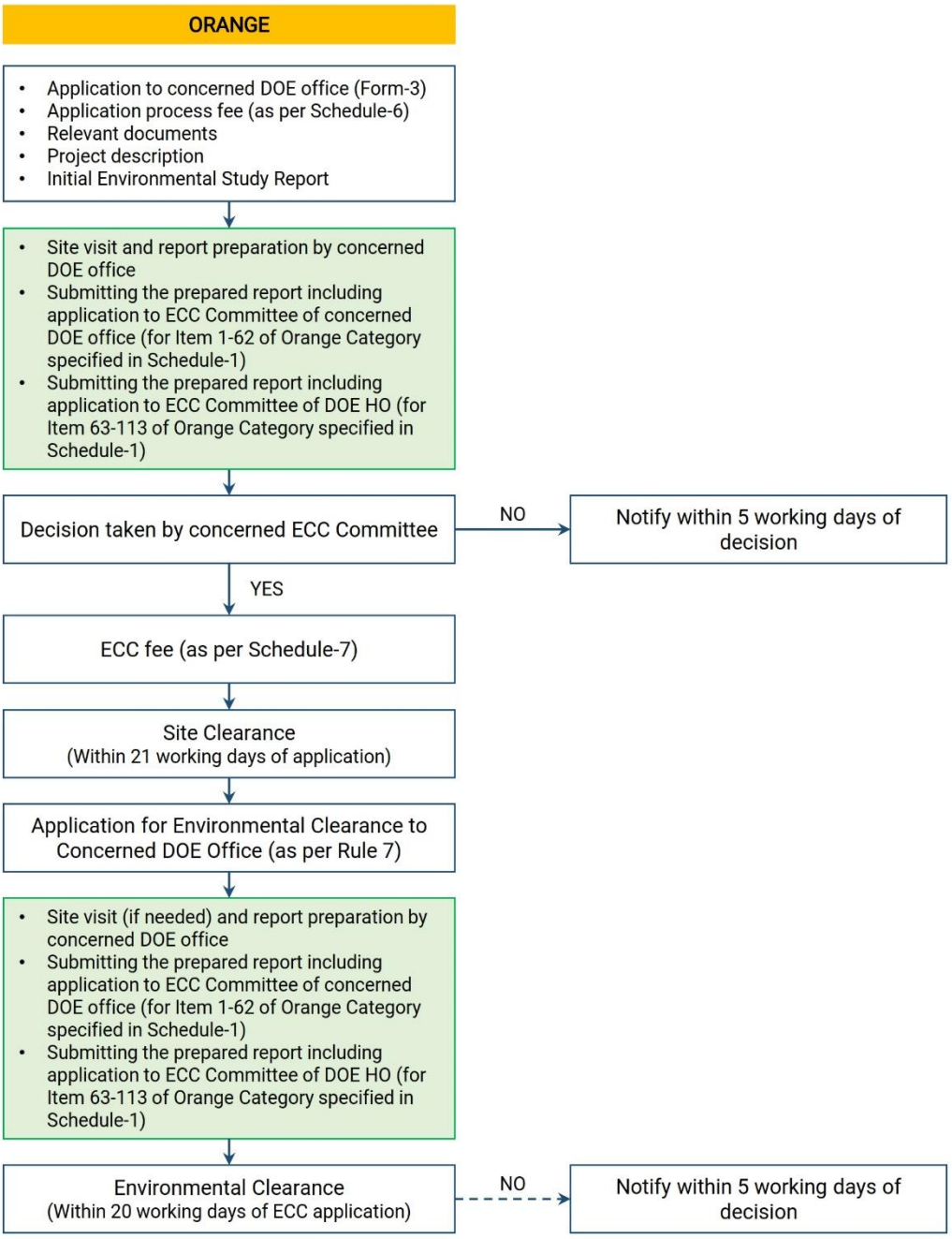


Figure 5-3: DoE Environmental clearance procedure for Orange Category (As per ECR 2023)



Note: ECC Committee of DOE HO may recommend for Environmental Impact Assessment (EIA) (for Item 63-113 of Orange Category specified in Schedule-1). The proponent should conduct EIA after the approval of recommendation by Director General (DG) of DOE.

Detailed Design and Tendering: Assuming the Project is technically feasible and financially viable and permits (Site Clearance/Environment Clearance) have been obtained, WPPNDPL will proceed to the detailed design and tendering phase. The contracts would be awarded to competent contractors through a bidding process. The project specific ESMP (including the biodiversity management plan if required) would be part of the contract document for implementation by the contractors/ subcontractors executing the projects. In case private land is procured through private negotiation, a third party will be through tendering process to review and certify whether the process is fair and cohesion free.

Implementation, performance management and monitoring: At this stage, Contractor will implement the Environmental and Social Management Plan (including Biodiversity Management Plan) to minimize/mitigate environmental and social impacts. Occupational and community health & safety aspects would also be given due importance by the Contractor during construction work. At workplace near miss / incident / accident will be reported and investigated using proper template. WPPNDPL would have oversight on the implementation of all these activities. Implementation of Resettlement Action Plan would be taken up by the Involuntary Resettlement (IR) Implementing Agency prior to the initiation of the civil works.

The Contractor would be responsible for carrying out regular reporting to WPPNDPL for the implementation of the ESMP. Similarly, the IR Implementing Agency would also report the progress on implementation of Resettlement Action Plan to WPPNDPL. In turn, the WPPNDPL would report to EHS Dept of WPPNDPL PIU.

5.3 The Safeguards Implementation Process

During the planning and designing of the transmission line project the safeguards planning would involve conducting Environmental and Social Impact Assessment including additional specialised studies (if required). However, during the project implementation the focus of safeguards would be primarily on:

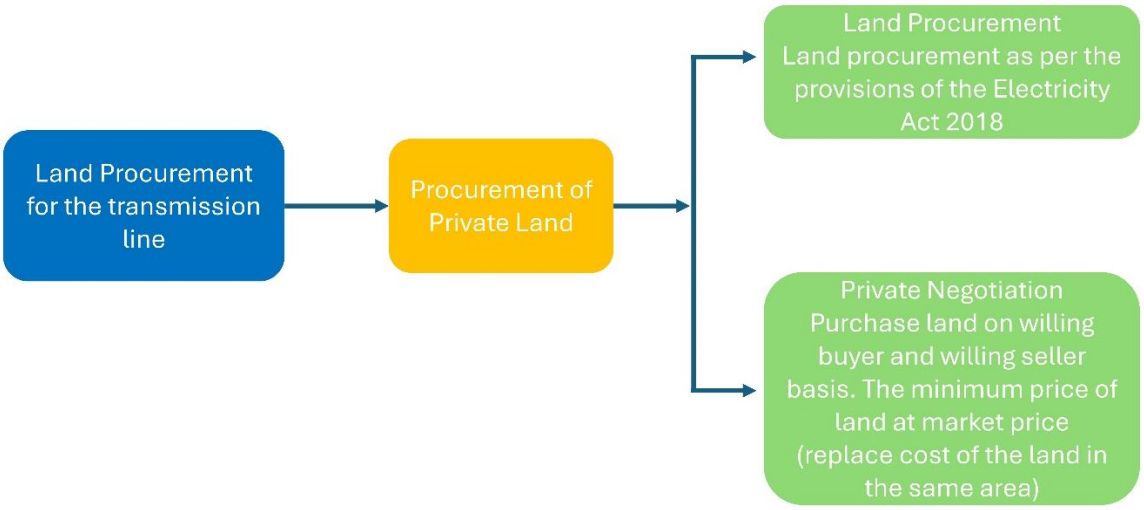
- Procurement/ Acquisition of Land
- Implementation of the Environmental and Social Management Plan

The mechanism adopted for ensuring safeguards are implemented during these processes is described below:

5.3.1 Process for Procurement/ Acquisition of Land for the Transmission Lines

The process for procuring land for the transmission line involves several key steps. Initially, a preliminary planning phase identifies the land requirements and selects potential routes that minimize social and environmental impacts. This is followed by a feasibility study and an Environmental and Social Impact Assessment (ESIA) to evaluate the technical suitability of the land and identify potential impacts. Stakeholder engagement is crucial, involving community consultations and public meetings to ensure transparency and gather input. A detailed land survey maps the required land boundaries and identifies ownership. The next step is land valuation and compensation planning, ensuring fair market value and legal compliance. Negotiations with landowners aim to reach mutually acceptable terms, formalized through legal agreements. Government approvals are obtained, and the formal acquisition process is completed, including the transfer of ownership. If necessary, a Resettlement Action Plan (RAP) shall be developed and implemented to support affected individuals. Continuous monitoring and a grievance redressal mechanism ensure compliance and address any issues. Finally, all documentation is finalized, and preparations for transmission line construction begin.

Figure 5-4: Process of Land Procurement



5.3.2 ESMP Implementation

During the construction stage due care shall be taken to minimise/ mitigate environmental impacts. WPPNDPL would also give utmost importance to the health & safety of workers, employees and nearby communities as described in the Environment and Social Management Plan. The implementation of the Resettlement Action Plan would be carried out by the IR Implementing Agency.

The EHS Dept. of WPPNDPL would maintain close watch on the environmental and social safeguards implementation through a system of Monitoring & Review.

5.3.3 Grievance Redress Mechanism

For this proposed project, a systematic Grievance Redress Mechanism shall be set up for WPPNDPL, which would help in resolving grievance/ disputes related to the environmental and social performance of the project. The system would be used by the stakeholders including affected/displaced persons to flag-off any concerns/grievance/disputes in the project and seek redressal of the same thereby ensuring effective participation.

A two-tier grievance mechanism has been considered and would be active for the entire life of the project. This mechanism is linked with the existing grievance redressal mechanism. The grievance redressal mechanism is presented below:

Two Tier Grievance Redress Mechanism

The complaints shall be registered verbally (in person, over phone), in writing or by mail at Complain Centre. The complaints received would be recorded in a Register of Complaints along with the description of the complaint. date. name of the Aggrieved along with the contacts. Within 7 days of receiving grievance at Complain Centre, the same will be sent to WPPNDPL.

Tier I: Local Level GRC (LGRC)

The composition of local level GRC (LGRC) with representations from Project Proponent, INGO, local public representatives, representatives of affected people including women in the Project area to ensure a participatory process and to allow voices of the affected communities in the grievance procedures.

A representative of PAPs (based on the recommendation of INGO and approved by the Convener) will be a member of the LGRC. The Member-Secretary of LGRC will be available and accessible to PAPs to address concerns and grievances. Unresolved cases will be forwarded to the PGRC. The LGRC is

empowered to take a decision, which is bound upon the Project Proponent. But it requires the approval of the Project Director for implementation of the decisions.

Tier II: Project-Level GRC (PGRC)

The Project-level GRC will review all unresolved cases involving social and environmental issues of the project. The Project Director will head the PGRC. The Member-Secretary in the PGR will provide necessary knowledge and information regarding relevant standard policies and international protocols. He/she will also set examples of resolving such grievances from other development projects in Bangladesh. The PGRC should establish fairness and transparency in the resolution of grievances by project-affected persons. In case of technical or environmental issues as well as any legal matters, the Team Leader of the INGO will advise the PGRC. In specific cases, environmental and social development specialists of ESU or external legal advisors may be consulted, if required.

Court of Law: If the grievance/ complaint is not resolved at PGRC Level or the complainant is not satisfied with the solution provided by PGRC, the person may approach the Court of Law.

5.4 Consultation and Disclosure

Through the process of consultation and disclosures, WPPNDPL would envisage to build participation of stakeholders at each stage of project planning and implementation. WPPNDPL would be responsible not only for ensuring participation of the community in the consultation process but to make it effective ensure integration of the feedback received from stakeholder into the project plans where it deems fit.

5.4.1 Consultation

A Consultation Framework has been prepared to ensure involvement of stakeholders at each stage of project planning and implementation. To ensure community participation at different stages of the project the Consultation framework has been proposed in Table 5-1.

Table 5-1: Summary of Consultation Framework

Project Phase	Activity	Details	Responsible Agency	Target Stakeholders
Conceptualization	Screening Surveys	Identification of the Environmental and Social Sensitive Areas which needs to be excluded	EHS Dept of WPPNDPL PIU/ Environmental and Social Consultant	WPPNDPL, PGCB, Land Revenue Office
	Stakeholder Mapping	Cross-section of stakeholders to be identified in order to facilitate their participation in the project	EHS Dept of WPPNDPL PIU/ Environmental and Social Consultant	WPPNDPL, PGCB, Agricultural office, Forest office, Land Revenue Office, Department of Environment
	ESMF Disclosure	Reference Framework for the WPPNDPL Environmental & Social Sensitivities Issues and & Mitigations in WPPNDPL Procedures to be followed	EHS Dept of WPPNDPL PIU/ Environmental and Social Consultant	WPPNDPL, WPPNDPL, PGCB, Agricultural office, Forest office, Land Revenue Office, Department of Environment

Project Phase	Activity	Details	Responsible Agency	Target Stakeholders
Planning	Detailed Surveys	Identification of the Environmental and Social Sensitivities	EHS Dept of WPPNDPL PIU/ Environmental and Social Consultant	Local Land Revenue Officer, Agricultural office, Forest office, Union councils, Local Community People
	Stakeholder meetings	Stakeholder meetings for determining land compensation value	Contractor along with EHS Dept. of WPPNDPL PIU and Involuntary Resettlement (IR) Implementing Agency	
		Landowners		
Implementation	Construction work	Identification of sensitivities along the transmission lines alignment, Identification of landowners	Contractor along with EHS Dept. of WPPNDPL PIU and IR Implementing Agency	
	Disclosure of Final Compensation or any other entitlements	Dissemination of translated (in local language) entitlement / compensation details along with process of disbursement	Contractor along with EHS Dept. of WPPNDPL PIU and IR Implementing Agency	Local Land Revenue Officer, Agricultural office, Forest office, Union councils, Local Community People
	Stakeholder meetings	Landowners	Contractor along with EHS Dept. of WPPNDPL PIU and IR Implementing Agency	Local Land Revenue Officer, Agricultural office, Forest office, Union councils, Local Community People

5.4.2 Information Disclosure

The information disclosure would provide citizen centric information on the policies and the details of projects along with its implementation process. It would be carried out in accordance with the provision of the AIIB Policies on Information Disclosure. The Information Disclosure Procedure would ensure that information concerning the Project activities is made available to the public in the absence of a compelling reason for confidentiality.

The type and timing of the disclosure, channels to be used, frequency and duration of disclosure are presented in Table 5-2

Table 5-2: Summary of Information Disclosure Plan

Project Phase	Documents to be Disclosed	Frequency and Duration of Disclosure	Channels of Disclosure
Project Conceptualization	ESMF Disclosure	Once, after it is approved by WPPNDPL Board and will remain disclosed for the entire life of the project	Website of WPPNDPL Information leaflet to be provide during consultation meeting
Planning	Environment and Social Impact Assessment including the Environment and Social Action Plan	Once, after it is approved by WPPNDPL Board and will remain disclosed for the entire life of the project	Website of WPPNDPL
	Resettlement Action Plans (if required) and Biodiversity Assessment	Once, after it is formally accepted by WPPNDPL and approved by AIIB and will remain disclosed during the entire lifecycle of Project	Website of WPPNDPL WPPNDPL would make the RP available at places such that affected persons or any other stakeholder related to the project, or any civil society organization may get access to it and in the local language. Places like — DC's Office, Office of Union /Town/City Councils, Contractor's Office, if any
Tendering	Grievance Redress process	Once it is formally accepted and institutionalized	WPPNDPL PIU, Office of Union/Town/City Councils
Implementation	Information regarding Land losers and their entitlements in local language	Once at the start of the project and as and when demanded by the PAP	Through leaflets, or other IEC materials, especially developed for the purpose in local language one to one consultations with project affected peoples (PAPs) Community consultations List of land losers along with the compensation amount to be put up at WPPNDPL PIU

Project Phase	Documents to be Disclosed	Frequency and Duration of Disclosure	Channels of Disclosure
	ESMP, RP Implementation Report	At regular intervals	Extracts put up at WPPNDPL PIU, Full Report available on WPPNDPL Website

5.4.3 Feedback Mechanism

The feedback of the project affected persons/citizens would be captured through the Head Office of WPPNDPL and conveyed to WPPNDPL PIU for necessary action. The feedback mechanism as discussed in the Grievance Redress Mechanism would be used.