DRAFT

Environmental and Social Impact Assessment (ESIA)

Modernization and Capacity Enhancement Project of BREB Network

(Rajshahi-Rangpur Division)

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Prepared By

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LIST OF ACRONYMS

AEZ	Agro-Ecological Zone
BBS	Bangladesh Bureau of Statistics
BMD	Bangladesh Meteorological Department
BREB	Bangladesh Rural Electrification Board
BWDB	Bangladesh Water Development Board
BOD	Biochemical Oxygen Demand
BOQ	Bill of Quantity
CITES	Convention on International Trade of Endangered Species
CPR	Cultural Property Resources
COD	Chemical Oxygen Demand
CDMP	Comprehensive Disaster Management Programme
DO	Dissolved Oxygen
DoA	Department of Archeology
DoE	Department of Environment
DL	Distribution Line
DPP	Detail Project Plan
DoE	Department of Environment
DGM	Deputy General Manager
ECC	Environmental Clearance Certificate
ECR	Environment Conservation Rules
ECA	Environment Conservation Act
EA	Executing Agency
ESF	Environmental & Social Framework
EHS	Environment Health and Safety
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
FI	financial intermediary
FGD	Focus Group Discussion
FD	Forest Department
GAP	Gender Action Plan
GBV	Gender Base Violence
GHG	Greenhouse Gas
GIS	Geographical Information System
GM	General Manager
GoB	Government of Bangladesh
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
HFL	Highest Flood Level
IEE	Initial Environmental Examination
IA	Implementing Agency
IPP	Indigenous People Plan
MoEFCC	Ministry of Environment, Forests and Climate Change
NOx	Oxides of Nitrogen
NYS	Not Yet Standard
OHS	Occupational Health and Safety
PCBs	Poly Chlorinated Biphenyls
PBS	Palli Bidyut Samity
PD	Project Director
PM	Particulate Matter
PIU	Project Implementation Unit
PPE	Personal Protective Equipment

RE	Retainer Engineer
RAP	Resettlement Action Plan
ROW	Right of Way
SO_2	Sulphur Dioxide
SEP	Stakeholder Engagement Plan
SPIA	Sub Project Influence Area
SPC	Spun Pre-Stressed Concrete
SPM	Suspended Particulate Matter
SPS	Safeguard Policy Statement, 2009
TDS	Total Dissolved Solids
TSS	Total Suspended Solids

EXECUTIVE SUMMARY

INTRODUCTION AND BACKGROUND

At present BREB is rendering its services through 80 Palli bidyut samity (PBS) and has already achieved 100% electrification with recommendable success. According to the Power System Master Plan 2016 (PSMP-2016), the demand for electricity in 21 PBSs is forecasted to be 3734 MW by 2030.

BREB has prepared this Environmental and Social Impact Assessment (ESIA) study for aforesaid 21 PBS's of Rajshahi-Rangpur under the name of 'Modernization and Capacity Enhancement of BREB Network (Rajshahi-Rangpur Division) Project'. BREB is willing to initiate a modernization and capacity enhancement project in 21 Palli bidyut samity (PBS) such as Bogura-1 PBS, Bogura-2 PBS, Chapai-nawabganj PBS, Joypurhat PBS, Naogaon-1 PBS, Naogaon-2 PBS, Natore-1 PBS, Natore-2 PBS, Pabna-1 PBS, Pabna-2 PBS, Rajshahi PBS, Sirajgonj-1 PBS, Sirajgonj-2 PBS, Dinajpur-1 PBS, Dinajpur-2 PBS, Gaibandha PBS, Kurlalmoni PBS, Rangpur-1 PBS, Rangpur-2 PBS And Thakurgaon PBS in Rajshahi-Rangpur Division.

OBJECTIVES OF THE STUDY

The overall objective of this study is to ensure that the project is developed in a sustainable manner, all possible negative effects are mitigated as much as is practicable, and positive impacts are enhanced. More specifically, the ESIA aims to identify the likely potential impacts to be generated by the project and to provide a set of actions that need to be implemented to meet national and international safeguards standards.

SCOPE OF WORK

The scope of the present ESIA report describes the following important features: i) A review of the environmental & social legislative, regulatory and policy guidelines and considerations relating to the implementation of the project; ii) A review of the AIIB ESF guidelines and GAP analysis between AIIB and GoB policies; iii) A general description of the project and existing physical, biological, and socio-economic conditions; iv) Analysis of different alternatives and associated facilities to the project in terms of environmental and social perspectives; v) Identification and assessment of the potential impacts on the natural and human environment in the project area due to implementation of the project; vi) Consultation with the locals/stakeholder involving concerned people in order to identify and act on any undocumented or perceived environmental issues; vii) Identification of mitigation measures in the form of an Environmental & Social Management Plan (ESMP); and viii) Recommendations and conclusions in order to operate the project work in a sustainable manner.

APPROACH & METHODOLOGY

A combination of primary and secondary data was used in this ESIA study. The primary data includes the data from direct field observations and secondary data includes a review of the relevant information from several government departments relevant secondary reports. Discussions were held with stakeholders including government officials, community representatives, etc. To establish the baseline biophysical conditions within the study area, relevant secondary and primary data were collected and reviewed, a comprehensive field visit was undertaken, and several consultations with local people were carried out. By categorizing the likelihood and consequence of potential impacts, direction can be given to those potential impacts that should be subjected to the most rigorous attention despite limited availability of secondary information on the environmental quality and the ecology of the study area. In addition, a schematic of the risk assessment process has been adopted for the development of this ESIA.

POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

Due to the nature and small scale of this project and applying the ESF-2022 of AIIB the project has been classified as category B project as it has a limited number of potentially adverse environmental and social impacts.

According to the guidelines illustrated in ECR, 1997 of DoE, this project falls under the Red category of projects on the basis of location, size and severity of potential environmental pollution. it needs to prepare Environmental Impact Assessment (EIA) in due course following prescribed format and to be submitted to the DoE for getting the Environmental Clearance Certificate (ECC) during project feasibility and detailed design stage respectively. BREB has already got the ECC and further renewal from the DoE as per ECR, 1997. However, the project is not classified under any category as per the latest ECR, 2023 which has been published on 05 March 2023.

Considering the project implementation, the land acquisition should be completed before any civil work starts as per ARIPA 2017. However, the project will not follow the general ARIPA 2017 for substations sites under PBS of the BREB but will follow willing buyer and willing seller mechanism. In case of negotiation failure or seller refuses to sell the land at any point, PBS will change location and seek another seller. There will be no expropriation. All of the relevant policies & guidelines related to the project scope is discussed on main chapter.

PROJECT DESCRIPTION

Under the project, there are 84 new 33/11 kV substations to be installed by 30 June 2028 with modern equipment and technology. Most of the new substations will be of indoor type, which typically requires about 0.40-0.50 acres of land. A typical 33/11 kV substation involves installation of 10/28 MVA transformers, installation of 33 kV bays, a control room, and installation of associated 33/11 kV feeders. The project will upgrade/modernize the capacities of 32 nos. 33/11 kV existing substations within the same timeline. Upgrading work involves increasing the capacity of transformers by installation of new (or replacement of existing) transformers, installation of bays, construction and renovation of existing control rooms, and installation of associated feeders.

The project will be construction/conversion of 6465 km 33 kV & below voltage line. The new 33 kV and 11 kV lines will be mostly aligned along the ROW of existing rural roads although some sections may need to pass thorough agricultural or plantation areas; alignments will be determined following detailed line survey by contractors. This project will also cover conversion of 3350 km LT to HT line, conversion of 4560 km HT 1-ph to HT 3-ph line, construction of 06 sets of River Crossing Tower, installation of SCADA System for 5 Substations in Rangpur PBS-1, reconstruction of 314 km line in flood prone area and installation of 4990 fault locator.

The tentative commencement date of the project is 1st July 2023 and the estimated date of completion is 30 June 2028. Total cost of the project is estimated for 2028 is 555353.35 Lakh BDT.

BASELINE ENVIRONMENTAL AND SOCIAL DATA

The baseline environmental quality is assessed through field studies within the impact zone for various components of the environment like air, noise, water, land and socio-economic conditions etc. Data was collected mostly through an environmental survey using a checklist as described in the methodology section. The firsthand information collection was limited to record the micro-environmental features within and adjacent to the project-influenced area. Collection of primary information includes extrapolating environmental features on proposed subproject design, tree inventories, location, and measurement of socio-cultural features adjoining proposed development.

The proposed project areas mainly lying in the north-western part of the country and depends on the Ganges River for freshwater supply. In Rajshahi division Padma River and Jamuna

River are major navigation routes crossing the project area. The Rajshahi division of Bangladesh has in recent decades has been afflicted by recurrent and severe droughts.

Groundwater level in the project areas is depleting in an accelerating rate every year. Rate of depletion in wet season is higher than the rate in dry season. As per the seismic zone map, Rajshahi division falls in all three zones. It means the project area is prone to all types of seismic intensity.

While identifying the diversity of floral and faunal species in the subproject areas, some wildlife species were identified as locally vulnerable. The vulnerable species are Bengal monitor, Rat snake, Common vine snake, Crested Serpent-eagle, Yellow-footed green pigeon, Common mongoose, etc.

When the survey was conducted in 2021, all the substation's location had not been selected yet. Therefore, the survey team surveyed the project location on sample basis where most of the land are purchased. As per the interim land audit report 30 substations (out of 116 SS) of Rajshahi and Rangpur Divisions have been audited in which 22 are new land purchased for proposed substations, 1 is donated land for proposed substation, and 7 are old substations. BREB always intends to purchase the land far away from the resettlement and sensitive receptor. In terms of survey data, it was found that the proposed Bogra PBS-2 substation site lying in agricultural land. The total amount of the land is 43 decimals with a moderate level of vegetation cover. A local road also passes through the substations site. There is no household and settlement within 200 meters of the project location. In Noagaon PBS, the substation site lies within agricultural land. A few bricks field located around 550 meters location. There is an approach road beside the project location. Within 300 meters of the proposed site, some settlements are observed. Details are discussed in the main chapter of this report.

During survey works no major educational and religious institutions were observed at substations site and distribution line areas. BREB always prioritized those areas where no interventions affect the properties of the local community.

From the assessment of the ambient air quality of the project area in Rangpur, it has been anticipated that all the parameters are within national standard according to the ECR-97.

About 60% of Rangpur inhabitants use groundwater for drinking and residential reasons. Therefore, groundwater has become the prime source of irrigation in the dry period. As per the seismic zone classifications, the subproject areas within the Rangpur division falls both in Zone II and Zone III means medium seismic intensity. The project areas are in low river flooding, moderate river flooding, moderate tidal surge, severe tidal surge and not flood-prone areas. Simillar to the Rajshahi division, four major rivers (Padma, Jamuna, Brahmaputra, Teesta) flow through these areas. There are also other small rivers and marshy lands like Chalon Bill etc. When flood water levels rise during monsoons, the clearance of existing power lines is reduced and BREB have to shut down the power supply for a few days, which deprives the consumers using that particular line from power supply.

ANALYSIS OF ALTERNATIVES

In the Rajshahi-Rangpur Region of West-Northern Bangladesh, the project will enhance the country's rural distribution network, minimize aggregate, technical and commercial (AT&C) losses, increase the existing substations capacity, and number of substations within the geographical area of 21 PBS, the 33 kV source line which will be approved by SE&D directorate of BREB. The following points are taken into consideration for the selection of optimum route of distribution lines as well as river crossing towers: (i) The route of the proposed distribution line (DL) does not involve any human rehabilitation. (ii) Any monument of cultural or historical importance is not affected by the route (iii) The proposed route of DL does not affect any public utility services like playgrounds, schools, other establishments etc. (iv) The line route does not pass through any sanctuaries, National Park etc. (v) The line route does not infringe with area of natural resources. In addition, care is also taken to avoid Ecologically Critical Areas (ECA), critical areas, forest area, homesteads, cultural sites etc. As a result, the 'with'' project option was chosen above the 'no project' option. However, during

the design phase, different route alignment will be studied for the selection or finalization of DL route. Detail impact assessment of different line routes will be assessed later.

EVALUATION OF ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS

The major potential environmental impact during construction is associated with old equipment, particularly transformers that leak and may contain oil depending on the date of manufacture and oil replacement. Removal, storage and disposal of phased-out transformers will be done in accordance with international good practices and the Government regulations to ensure that there will be no residual impact associated with the disposal of any old transformers that were found to contain PCBs.

According to the final DPP no land acquisition will occur. Respective PBSs have purchased the land for substation construction. The rest of the land will be purchased by win-win situation as BREB's policy. If any people are affected during the land purchase for substations or distribution line, a standalone RAP may need to be prepared. Upgradation of existing lines will have no significant impact on the surrounding environment. Under this project 19,489 km of overhead distribution line will be constructed/ upgraded/ converted. Out of which most of the line construction work will be existing line up-gradation, conversion & augmentation. For up-gradation, conversion & augmentation of existing line there will be minimal adverse impact and there will be no economical/ physical displacement to landowners.

New lines will be constructed for newly constructed substation's 33 kV source and supply side 11 kV backbone which is very small amount in comparison to the total line to be constructed. Considering the operation and maintenance ease of distribution line, selecting the line route for 33 kV & 11 kV lines along the roadside which is generally public property is preferable. For 33 kV & 11 kV lines, a very small portion of total line may go through the private agricultural land. The construction of distribution lines will not use of towers, and instead use poles. Based on line's type, generally 25 to 32 poles are required per km of distribution line, each pole use on average 2'-2' area of land and the land area affected by ROW is 10' from the center of the line either side (both for 33 kV & 11 kV line). From BREB's early experience, most of the lines will go through public land, there will be no significant permanent and temporary economical/physical displacements. The distribution line route will be finalized during detailed design and the impact will be assessed if any DL line go through the private land and that result in physical displacement. While there is no legal provision of Bangladesh Electricity Act 2018 to compensate any land loss that took place in the construction of Distribution line, this is the key gap with AIIB ESS-2. To minimize the gap, BREB has kept the provision to compensate for affected crops, tree and for vulnerable households. In construction of distribution lines, There will be no use of towers but poles will be used instead. Generally, SPC Pole will be used as it is environment friendly, made from recycled materials and contribute less to deforestation compared with wooden poles. The extent of land required for the installation pole is very small and varies based on pole size. Generally, each pole requires on average 2'-2' area of land.

There will be some temporary impacts in terms of crop loss which is not significant. However, this environmental & social study confirmed that most of the line will go through both barren & cropland and most of the lines will be constructed alongside existing roads. The new lines will be defined considering public demand and confirmed after detail design process. Approximately 30 poles will be installed per kilometer and one electric pole require 2/2 feet of space. Resettlement costs will not be applicable for pole erection. During transportation if any crop land is affected, then crop compensation will be given.

A total of six (06) river crossing towers will be constructed, having very minimal impact over the surrounding environment. The main reason for the minimal impact is that all the river crossing towers will be constructed far away from the riverbank and there is no possibilities of flood and erosion. BREB will get navigation clearance from BIWTA prior to construction of river crossing tower.

There will be temporary effects in terms of loss of crops during the construction of distribution lines which will be very minimal and can be mitigated during the construction.

The project will involve erection of 3335 km of 33 kV and 3238 km of 11 kV or below distribution lines by 2028. The 33 kV new lines will connect new/upgraded substations from existing substations, whereas 11 kV new lines will be erected to connect new villages. The distribution line requires erection of poles, cables and other accessories. The new 33 kV and 11 kV lines will be mostly aligned along the ROW of existing rural roads although some sections may need to pass thorough agricultural or plantation areas; alignments will be determined following detailed line survey by contractors. No structures are expected to be affected under the distribution lines. Some poles may be constructed on the private land with adequate consent from landowners. BREB is aware of this issue and will minimize as much as possible.

LABOR AND OSHE

The primary objective of ESS-1 as per "AIIB Environmental & Social Assessment and Management" is to promote sound labour management relationships and enhance the development benefits of a project by treating workers in the project fairly while also providing them with safe and healthy working conditions.

During the construction phase of the project, a huge number of manpower will be required. Use of locally available labors creates minimum effects on social risks such as gender-based violence, theft, price hiking of daily used products etc.

A Labor Management Plan (LMP) and Occupational Health and Safety (OHS) Plan will be prepared by the respective contractor. GRM will be established to address labor grievances related to health and safety aspects.

A Workers' Code of Conduct has been outlined for this proposed project which is essential to ensure the safety, efficiency, and professionalism of all personnel involved in the project. Construction of these substations and distribution line projects can involve various tasks, so the Workers Code of Conduct outlined the key aspects like Safety, Training and Certification, Electrical Codes and Regulations, Quality Workmanship, Worksite Cleanliness, Emergency Procedures, Biodiversity Conservation, GBV Prevention, SEA and SH Prevention, etc.

ENVIRONMENTAL & SOCIAL MANAGEMENT PLAN

A detailed ESMP with possible mitigation measures during pre-construction, construction, and operational phases has been proposed in this ESIA report. The ESMP table is separated for turn-key contractor and for the line contractor. A standard compensation plan must be developed for the individuals or households who are affected due to proposed project and any injury or diseases occur during construction or operation phase.

The BREB is the key authority to follow up all the relevant environmental safeguard requirements following institutional arrangement. In addition, the relevant organizations such as PBS, RE section of PBS, contractor, DoE and FD are also included. Enhancement of the capacity of the BREB's ESU is required for the effective implementation of proposed mitigation measures and monitoring the results. Training programs and awareness workshops are also essential.

An ESMP budget has been prepared for the proposed project. ESMP budget delineates that the total budget for pre-construction phase & construction phase is BDT 3,27,29,600 and derive from the project capital cost. In addition, the recurrent cost will be considered for the operation phase. For the operation period the budget is prepared on a yearly basis.

MONITORING & REPORTING

A monitoring schedule has been drawn up based on the environmental components that may be affected during the preconstruction/construction and operation stages of the project. Monitoring activities will be performed during four years of construction period. The schedule of implementing the ESMP has been prepared based on the environmental issues/parameters illustrated in the ESMP which will be followed at a certain period of the project. However, this implementation schedule is subject to change depending on the situation.

The BREB is the key authority to follow up all the relevant environmental safeguard requirements following institutional arrangement. In addition, the relevant organizations such as PBS, RE section of PBS, contractor, DoE and FD are also included.

PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

Eight (08) consultation meetings were conducted in different 21 PBSs. No significant environmental and social concerns were raised, and all stakeholders consulted strongly support the project and are looking forward to the benefits of improved electricity services. Some pointed out that the project will provide benefit to students as they will get assured power supply during the evening for studying. The consultation process will be continued during project implementation (with COVID-19 precautions) to ensure that stakeholders are fully engaged in the project and have the opportunity to participate in its development and implementation. As per the information disclosure processes, BREB has also arranged a workshop on ESIA and RPF where GM/SGM of all respective PBSs and other officials were present. The consultant presented specific findings along with suggestions on the environmental and social aspects of the RPF and ESIA.

STAKEHOLDER ENGAGEMENT PLAN & GRIEVANCE REDRESS MECHANISM

BREB Authority and contractors are responsible for the implementation of Stakeholder Engagement activities. This Stakeholder Engagement Plan is developed for the current Project design and capacity and is designed to facilitate information disclosure, consultation and participation, grievance redress mechanism within the project area throughout construction stage. The plan outlines the project provisions with regards to engaging with the community and receiving feedback during the project operation.

As a partner in the delivery of this project, the AIIB's environmental safeguard requirements were carefully considered during the preparation of this ESIA. Each GRC will have 5 members:

- Project Implementing Agency (BREB)'s official who is in charge of all construction and other activities at individual worksites will act as convener.
- A male worker representing the workers.
- A female worker representing the workers.
- Resident engineer of the Construction Supervision Consultant.
- A PIU official, designated by the Project Director, who is not associated with the construction activities in the field but a member of the PIU.

CONCLUSION AND RECOMMENDATION

Government of Bangladesh's vision on the power sector is 'To ensure affordable, reliable, sustainable and modern electricity services for all the people of the country by 2030'. Access to affordable and reliable electricity is a key requirement for both economic development and poverty reduction. Without improved electricity coverage, particularly in rural areas, Bangladesh cannot achieve the goals of national plans. So, this project has contributed to achieving the vision, mission of the Ministry/ Division and Implementing Agency.

This ESIA report is a live document, and BREB will continuously update when all the detail design is completed or any further information will be available to identify the risks and impacts and provide mitigation measures. Phase 1 Environmental Site assessment (ESA) should be conducted after approval from AIIB for all the existing substations, and any further recommendations arising from the findings of the Phase 2 ESA by BREB.

The project will enable sizeable employment opportunities for both skilled and unskilled workforces throughout the project implementation and operational period. The project through "linkage effects" will create opportunities to increase the industrialization employment opportunity and do the socio-economic condition of the country.

I. INTRODUCTION

A. BACKGROUND

1. Government of Bangladesh has accentuated to speed up the pace of electrification program throughout the country access to affordable and reliable electricity is a key requirement to both economic development and poverty alleviation. It is considered as the driving force of all development activities. Bangladesh Rural Electrification Board (BREB) has been established as a vital institution to help improving the quality of life of the vast rural multitude and accomplish continuous advancement to their socio-economic conditions through the supply of stable and reliable electric power to the rural areas of the country. At present, BREB is rendering its services through 80 PBSs and has already achieved 99% electrification with recommendable success.

2. According to Bangladesh Government's power system master plan (PSMP-2016), BREB has to supply 13,500 MW by 2025 and 18,200 MW by 2030 as against the national demand of 27,009 MW in 2025, and 39,670 MW in 2030 respectively. As per the 8th Five Year Plan of the Government of Bangladesh, power sector has been identified as a top priority and has considered increasing power consumption by more than 8% per annum and has been emphasized on ensuring uninterrupted, reliable and quality power supply, efficiency development and affordable prices, which is consistent with the proposed project. Also, as per SDG-7 (Ensure access to affordable, reliable, sustainable and modern energy for all), the target is 'By 2030, ensure universal access to affordable, reliable and modern energy services and the indicators are (a)' Proportion of population with access to electricity' and (b) 'Proportion of population with primary reliance on clean fuels and technology'. As indicator (a) has already been 100% achieved, the project is consistent with the indicator (b).

3. According to Vision-2041 of Perspective Plan (2021-2041), the demand for electricity will increase by 9.3% in the period 2021-2041. According to this plan, there is a need to increase the capacity of the distribution system. The implementation of the proposed project will increase the capacity of the distribution network, increase reliability and efficiency.

4. BREB holds the capacity to cater to 8,700 MW load at present, which is far behind the target. At present, the aforesaid master plan cannot be implemented unless the capacity of all 80 PBSs is enhanced. Existing overloaded distribution lines and substations must be upgraded, while the total power networking system must be modernized to meet and to provide improved quality deliverable power at the consumer end. Therefore, BREB has targeted to take modernization and capacity enhancement projects in each division to meet the projected demand & to ensure un-interrupted, reliable, quality, and affordable electricity supply for all. A feasibility study in this respect is therefore essential to identify the future demand for electricity for a modern & sustainable electricity distribution network and resource requirement for the purpose of supply of un-interrupted, reliable, quality, and affordable electricity.

5. As per power system master plan (PSMP-2016), total cumulative demand of electricity in 21 PBSs of Rajshahi-Rangpur Division is forecasted as 1,929 MW in 2021, which is equivalent to 2,031 MVA and required substation capacity is 3,249 MVA to accommodate the demand.

6. BREB has prepared the Environmental and Social Impact Assessment study for aforesaid 21 PBSs of Rajshahi-Rangpur under the name of 'Modernization and Capacity Enhancement of BREB Network (Rajshahi-Rangpur Division) Project'.

7. BREB is willing to initiate a modernization and capacity enhancement project in 21 PBSs such as Bogura-1 PBS, Bogura-2 PBS, Chapai-nawabganj PBS, Joypurhat PBS,

Naogaon-1 PBS, Naogaon-2 PBS, Natore-1 PBS, Natore-2 PBS, Pabna-1 PBS, Pabna-2 PBS, Rajshahi PBS, Sirajgonj-1 PBS, Sirajgonj-2 PBS, Dinajpur-1 PBS, Dinajpur-2 PBS, Gaibandha PBS, Kur-lalmoni PBS, Rangpur-1 PBS, Rangpur-2 PBS And Thakurgaon PBS in Rajshahi-Rangpur Division.

B. OBJECTIVES OF ESIA

8. The implementation of the project activities has both positive and negative impacts on the surrounding environment. These impacts will be on the physio-chemical, biological/ ecological, and socio-economic environment. ESIA is required to prevent and/or to reduce the negative environmental impacts to an acceptable level and to enhance the positive environmental impacts linked with the implementation of the subproject activities of the project.

9. The overall objective of this study is to ensure that the project is developed in an environmentally sound and sustainable manner ensuring that all possible negative effects are mitigated as best as practical and positive impacts are enhanced. More specifically, the ESIA aims to identify the likely potential impacts to be generated by the project and to provide a set of actions that need to be implemented to meet national and international environmental safeguard standards. The key objectives of the study are as follows:

- Present a general description of the project and the process.
- Analyze and compare E&S impacts among alternatives of the project.
- Identification of applicable national and international legal environmental and social requirements.
- Establishment of environmental and socio-economic baseline conditions of the study area.
- Identify the environmental impacts of the project and quantify them to the extent possible.
- Propose measures to avoid, reduce, minimize and mitigate the negative environmental impacts of the project.
- Development of Environmental and Social Management Plan (ESMP).

C. SCOPE OF THE ESIA STUDY

10. As per AIIB's Environmental and Social Framework (ESF), The bank determines the Project's category based on the Project's component presenting the highest environmental or social risk and potential impacts (including direct, indirect, cumulative, and induced impacts, as relevant in the Project area). The Project has been tentatively assigned Category B under the Bank's Environmental and Social Policy (ESP) because (i) it has a limited number of potentially adverse environmental and social impacts; (ii) the impacts are not unprecedented; (iii) few if any of them are irreversible or cumulative; (iv) they are limited to the Project area; and (v) they can be successfully managed using good practice in an operational setting.

11. The scope of work for the ESIA study involves environmental & social assessment of the activities involved in the 21 PBS authorities under Rajshahi-Rangpur Division. The work involved includes several small subprojects spread across 21 PBSs. This ESIA report has been prepared in accordance with the requirements of AIIB. The scope of the present ESIA report describes the following most important features:

- A review of the environmental legislative, regulatory and policy guidelines and considerations relating to the implementation of the project.
- A review of the AIIB ESF guidelines and gap analysis between AIIB and GoB policies.
- A general description of the project and existing physical, biological, and socio-economic conditions.
- Analysis of different alternatives and associated facilities to the project in terms of environmental and social perspectives.

- Identification and assessment of the potential impacts on the natural and human environment in the project area due to implementation of the project.
- Consultation with the locals/stakeholder involving concerned people in order to identify and act on any undocumented or perceived environmental issues;
- Identification of mitigation measures in the form of an Environmental & Social Management Plan (ESMP); and
- Recommendations and conclusions in order to operate the project work in a sustainable manner.

D. METHODOLOGY OF ESIA STUDY

1. Approach

12. The study has been conducted in accordance with Environment Conservation Rules (ECR), 1997 and EIA Guidelines for Industries, 2021, and AIIB Environmental and Social Framework (ESF) and its relevant Environmental and Social Standards (ESSs) 2022. The study is based on both primary and secondary data and information. The primary data includes data collected from field observations and secondary data includes review of the Bangladesh statistical and relevant information from Government Departments. For social baseline, discussions were held with stakeholders including government officials, community representatives and a wide range of beneficiaries by the respective PBS. The main purpose of this approach was to obtain a fair impression of the people's perceptions of the project and its environmental impacts.

2. Methodology

13. In order to establish the baseline of biophysical conditions within the study area, relevant primary and secondary data were collected and reviewed. Further, a comprehensive field visit was undertaken, and a number of consultations with local people were carried out. The data collection program was planned as per the Terms of References (ToR) for a better assessment. The data generated allowed us to better understand the complex interplay between the various biotic and abiotic factors within the study area and to establish the baseline conditions. Once this baseline was established it was used as a reference point to identify potential changes to the environment that may occur because of the proposed project activities, as well as to allow the development of measures to prevent, mitigate or manage these potential impacts. The following methodology was adopted for carrying out the ESIA of the proposed project:

a) Environmental Data Collection and Analysis

14. This section describes the methods and techniques used to investigate and describe the potential environmental risks of the Project. This included the gathering of primary and secondary data from various sources including discussions with groups, discussions with individuals, Government sources, PBS officials and from locally active NGOs.

15. The assessment of potential environmental impacts requires detailed information on all aspects of the habitats, biodiversity and physical aspects of the Project area. It also requires the development of an understanding of how the existing environmental processes work together to form a complex ecosystem. This information can be used to identify potential changes to the environment that may occur because of the Project, and to propose measures to prevent mitigating or manage potential environmental impacts.

16. The potential for environmental impacts was considered for activities during all stages of the proposed Project. This includes site establishment, drilling operations and site decommissioning and demobilization stages. As the environments within the Project area have not been widely studied in the past, knowledge gaps identified within the consultation phase have been filled through detailed investigations and field visits as part of this ESIA report.

(i) Secondary Data Collection

17. A review was conducted of the biophysical, ecological and legal literature relevant to the Project. The review of secondary sources and informal initial field investigations were undertaken in order to prepare a preliminary assessment of the physical and social environment, biodiversity, and conservation significance of the identified study area. This preliminary literature review also assisted in identifying data gaps which would require collection of additional primary information through physical field survey. The following activities were included in this phase of the Project:

- Data and information were collected from 21 PBSs and various governments relating to site aspects climate (weather), groundwater quality and soils. Secondary ecological data sources were collected and assessed.
- An appraisal was made of all legislation having direct and indirect relevance to environmental management within the Study Area including aspects such as biodiversity conservation, water quality, waste management, natural resource management and spill response.
- Previous environmental site studies, where available, were reviewed as well as relevant scientific journal articles; and
- Thereafter, an information gap analysis was undertaken to identify the areas where further primary data collection would be required to complete the ESIA.

18. Further details regarding the titles of the relevant literature, policies, acts and other regulations and guidelines reviewed and applied during the course of this process can be found in the legal section of this report.

(ii) Baseline Data Collection and Analysis

19. Primary data collection was initiated to fill gaps in knowledge resulting from the secondary data review. Further, it aimed to provide a site-specific data set of relevant physical and biological environmental aspects relevant to the Project. The primary data collection program was undertaken in April 2021 as well as October 2021 to November 2021. During the field visit, stakeholders were consulted, and several important additional secondary sources of environmental information, data and literature were collected.

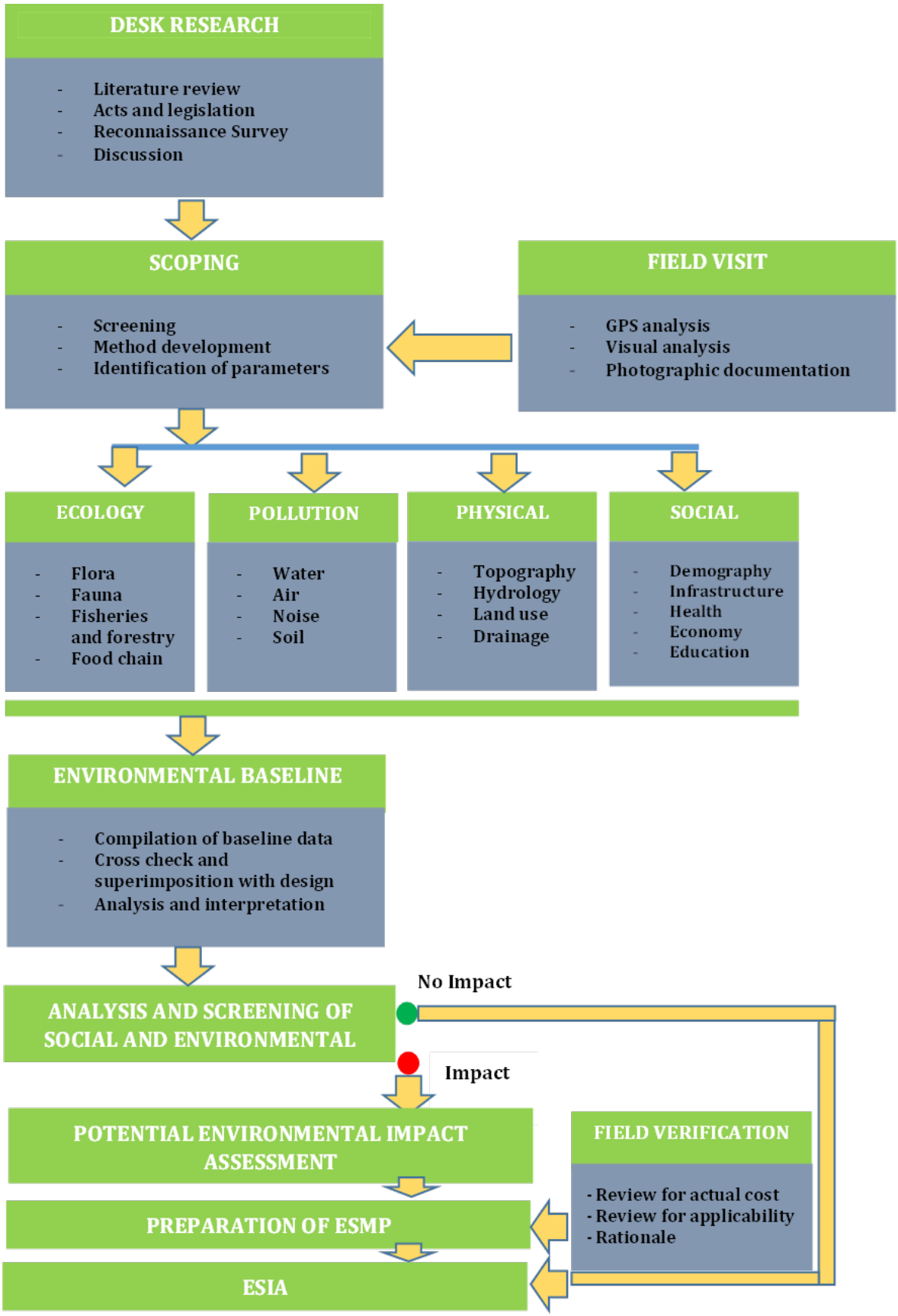

Figure I.1 Route map of Environmental & Social Impact Assessment (ESIA)

Physical Environment Field Survey

20. To comprehensively evaluate the baseline conditions, a field visit and data collection program incorporating several biophysical investigations was developed and implemented. A desktop assessment was then prepared to enable the collection of refined and verifiable information. The field survey program was conducted throughout the Project area by an environmental specialist team.

21. This survey aimed to identify important environmental components and issues within the study area. It included investigation and observation of the local landforms, market location, habitat types, drainage patterns, species abundance and distribution, soil types, water quality (surface water and groundwater), air quality, noise, vibration, and hydro-morphology.

22. The study area and surrounds were surveyed on foot and by boat. Important environmental features were identified and logged. Hand-held geographic positioning systems (GPS) were used to identify specific features for mapping and further analysis in the Project office. Features that were recorded or ground-truthed with GPS included:

- ✓ Habitation and settlement areas;
- ✓ Cultural Property Resources (CPR);
- ✓ Plantations;
- ✓ Habitat areas;
- ✓ Sensitive environments; and
- ✓ Transportation routes;

23. Direct observation and key informant interview techniques were employed within the field survey. Direct observations were subject to accessibility and were guided by satellite image maps and local information. Observations were made along rivers, roads, embankments, and local footways across the agricultural fields and village groves. An environmental observation checklist was completed for each of the areas.

24. Due to the unavailability of data during field survey it couldn't be possible to generate systematic presentation of the data. It should be mentioned that the extent of paddy land/agriculture land that would be affected by installation of electricity poles/towers and stringing conductors will be finalized during the detail design stage. The estimated length of the cables that would traverse along road easements will be finalized during the detail design stage. The estimated area of the water bodies, marshy land, and flood prone areas that would be affected by installation of electricity poles/towers and stringing conductors will be finalized during the detail design stage.

Ecological Field Survey

25. Initially, secondary data sources were reviewed to compile a potential presence/absence list of significant fauna and flora species. Thereafter two members among the field survey team were deployed to undertake the required sampling and assessment. Sampling and survey were conducted for both aquatic and terrestrial ecosystems; validation checks were confirmed against the earlier-compiled species lists in order to establish a comprehensive baseline.

26. The following activities were undertaken during the terrestrial and aquatic field surveys:

Direct Observation

27. Direct observation on the occurrence and abundance of flora and fauna was made while travelling along road edges, across the agricultural fields, the forest areas and within village groves. As well as direct sightings, identification of animal presence was also based

on identification of tracks, footprints, feeding signs and animal/bird calls. Appropriate field guides and data preforms were used for this activity so that information was accurately recorded.

Interviews with Local Residents

28. Many of the mammalian and reptilian species are cryptic and unlikely to be encountered using standard field sampling methods. As such, experience suggests that interviews with local people are a very useful method for collecting information on local biodiversity. This data is anecdotal and as such should not form the core of any assessment; however, it does nonetheless provide useful supplementary information. During the field survey period, extensive interviews with local people were conducted to collect information on animal and plant presence, including occurrences, behavior, breeding, distribution, and seasonal appearance.

Socioeconomic Field Survey

29. The ESIA study mostly used the socio-economic data collected by the Social and Resettlement Team for social assessment. However, during the environmental survey some consultations were conducted with the local people on environmental issues, but social conditions were also discussed.

Consultations

30. For this report, Focus Group Discussions (FGD) were conducted along the project corridor. A team of experienced professional and support staff has conducted surveys and consultation meetings after being briefed about the project. The respondents were selected by random sampling method from each of the locations. Respondents' contact information was collected for further verification, when required.

b) Impact Assessment Methods

31. The ESIA process identifies the potential environmental & social impacts that may result from the implementation of the project. Both positive and negative potential impacts for the project were identified through the application of standardized international best practice methods of environmental & social impact assessment. Some of the methods of environmental & social impact assessment utilized include:

- Ad-hoc methods;
- Application of expert judgment;
- Risk based approach including residual risk assessment;
- Systematic and sequential approaches; and
- Spatial analysis methods (including GIS).

32. In addition to these methods, social potential impacts were assessed based on previous experiences and opinions of local people and important stakeholders e.g., government agencies and through literature review relevant to the Project area. Social impacts were identified through public consultations, focus group discussions and from BBS 2011. As most of the substations' locations are not yet fixed, the survey team surveyed the selected sites until the field survey conducted.

33. The principal method for assessing the potential impacts of the Project on the biophysical and social environments in this ESIA was risk assessment. Details on the risk assessment process and how it was utilized to identify impacts, the likelihood and consequence of the actions and implement appropriate mitigation measures to reduce any potential impacts to an acceptable level are in the following sections.

Geographical Information Systems (GIS)

34. Geographical Information Systems (GIS) was used as a specialized analysis and presentation tool. Before commencing field investigations, spatial analysis of satellite imagery and present administrative areas and other boundaries/constraints was considered for the environmental assessments. For example, the sanctuaries, forest areas, spawning grounds, infrastructures, and the contract packages were identified. It also supports more detailed on-ground surveys, particularly spatial features that may be directly or indirectly influenced by Project activities.

35. Detailed on-ground validation of spatial information – particularly land use – was undertaken using a hand-held, non-differential GPS. The spatial data acquisition team took detailed transect walks through the Project area in order to identify various land use types and confirm the findings of the satellite imagery analysis. This extensive ground-truthing exercise both validated the land use mapping and identified additional sensitive areas to include within the environmental fieldwork for sampling.

Risk Assessment Matrix of Proposed Project

36. Relevant environmental issues were taken from the ESIA and further investigated within the ESIA utilizing a risk-based assessment methodology. Risk assessment is a process that supports the analysis of potential negative impacts that may result from implementation of a Project. It provides a means of categorizing how potential impacts are to occur, and of categorizing what the potential consequences might be if impacts were to occur.

37. Risk assessment was utilized in this ESIA as the primary tool to support environmental and socio-economic impact assessments. It provides a means of categorizing the frequency and magnitude of potential impacts and provides a basis for the application of different degrees of mitigation and management measures.

38. By successfully categorizing the likelihood and consequence of potential impacts, direction can be given to those potential impacts that should be subjected to the most rigorous attention. Such impacts are designated as potentially significant impacts. Alternatively, potential impacts that are shown to be infrequent and a low magnitude of consequence can be treated as insignificant. Figure I.1 presents a schematic of the risk assessment process adopted for the development of this ESIA.

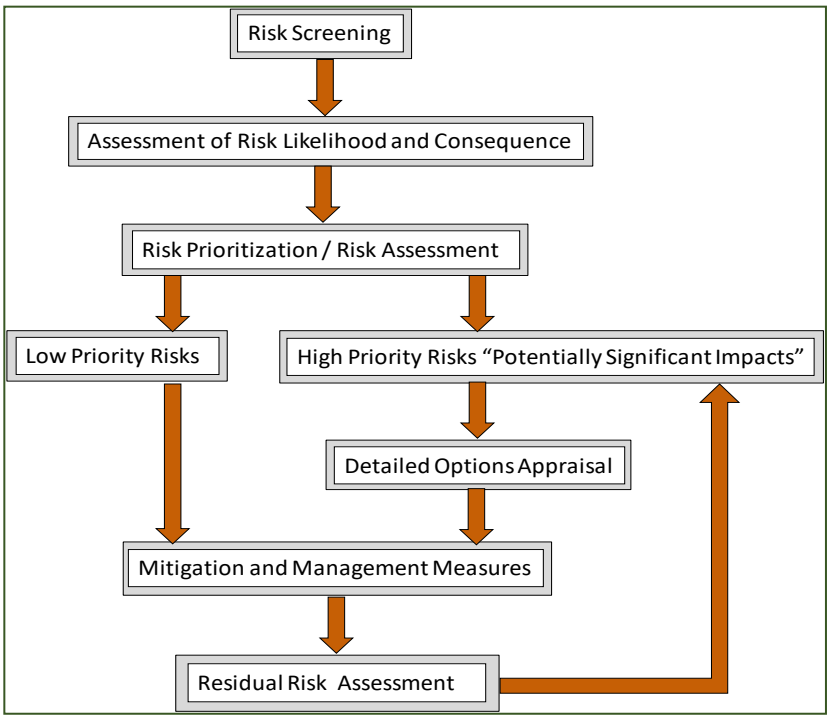

Figure I.2 Risk Assessment Process

39. All socio-economic and environmental impact assessment methods, including risk assessment, incorporate a degree of inherent uncertainty. This is largely due to the unavoidable variations and uncertainties characterized by natural, social and economic systems. However, the risk assessment allows analysis of risks (or potential impacts) to be classified on an empirical scale. Such a scale is useful because it limits the inherent subjective and interpretive nature of impact assessment. Further accuracy in risk assessment results is driven by the workshop approach to hazard categorization and through the application of experienced expert knowledge.

40. Certain impacts identified in this section have the potential to be significant. The determination of whether a given potential impact is significant depends on several factors:

- The potential for on-site and off-site impacts;
- The potential for direct and indirect impacts;
- The frequency and duration of a potential impact;
- The geographic area affected by a potential impact
- The period of time affected by any potential impact;
- The sensitivity of the receiving environment; and
- The degree of confidence with which the potential impacts of the action/activity are known and understood.

41. Measures of potential impact significance as part of the Project planning and assessment phase presented in this ESIA have been determined using a risk-based model. The risk-based model is a two-dimensional matrix of 'magnitude of impact' and 'likelihood'. Both are assigned scores between 1 and 5 based on severity or probability and multiplied to obtain the 'risk band'.

42. The 'magnitude of impact' is a 5-point based scale set by expert's judgment. The scale and its explanation are given in Table I.1.

Table I-1: Explanation and Assignment of Scores to 'Magnitude of Impact'

Color Band	Incidental	Minor	Moderate	Major	Severe/catastrophic
Score	Score: 1	Score: 2	Score: 3	Score: 4	Score: 5
Explanation	Impacts such as localized or short-term effects on habitat, species or environmental media.	Localized, long term degradation of sensitive habitat or widespread, short-term impacts to habitat, species or environmental media	Impacts such as localized but irreversible habitat loss or widespread, long-term effects on habitat, species or environmental media	Widespread and persistent changes in habitat, species or environmental media	Persistent reduction in ecosystem function on a landscape scale or significant disruption of a sensitive species.

43. The 'likelihood' is also a 5-point based scale set by expert's judgment. The scale and its explanation are given below.

Table I-2: Explanation and assignment of scores to 'likelihood'

Color Band	Rare	Unlikely	Seldom	Occasional	Likely
Score	Score: 1	Score: 2	Score: 3	Score: 4	Score: 5
Explanation	Rare or unheard of	Reasonable to expect that the consequence will not occur during this project though has occurred several times in industry	Exceptional conditions may allow consequences to occur within the project lifetime	Conditions may allow the consequence to occur during the project lifetime, or the event has occurred within similar projects	Consequence can reasonably be expected to occur in life the project

44. Therefore, "Risk" factor is derived from the following equation:

Risk = Magnitude x likelihood

45. The score of 'Risk' ranges from 1 to 25. The score is classified in 3 classes. The explanation is given in Table I.4. The score matrix for risk assessment has been used to identify the priority environmental impact and their mitigation plan.

Table I-3: Two-Dimensional Risk Assessment matrix

Impact			MAGNITUDE OF IMPACT				
			Incidental	Minor	Moderate	Major	Severe/cats.
			Score: 1	Score: 2	Score: 3	Score: 4	Score: 5
LIKELIHOOD	Rare	Score: 1	1	2	3	4	5
	Unlikely	Score: 2	2	4	6	8	10
	Seldom	Score: 3	3	6	9	12	15
	Occasional	Score: 4	4	8	12	16	20
	likely	Score: 5	5	10	15	20	25

E. THE ESIA TEAM

46. BREB has formed a multidisciplinary team of professionals having experience in conducting the ESIA of large-scale industrial and infrastructural development projects. The following table I-4 represents the names with the position of the professionals.

Table I-4: ESIA Team with the names and position of the professionals

SL	Key Personnel Name	Designation for this Assignment	Area of Expertise Relevant to the Assignment
1.	Md. Shafiqur Rahman	Team Leader / Environmental Specialist	Environmental Science, Water Resources Development
2.	Mamun Ar Rashid	Social Development Specialist	Social Science
3.	Raisin Akter Feroz	Biodiversity Expert	Environmental Science/ Ecology
4.	Madhu Sudan Das	GIS Expert	Urban & Regional Planning
5.	Saiful Islam Imran	Junior Environmental & Social Specialist	Environmental Science, Geographic Information System

F. CONTENTS OF THE REPORT

47. This report includes the following main elements.

Chapter I: Introduction and background

This chapter consists of the background of the project along with the objectives, scope and the methodology of preparing the ESIA report. This chapter also includes the organization of the total ESIA report.

Chapter II: Policy, Legal and Administrative framework

In this chapter the national and international laws and policies are described which are relevant to the environmental aspects of the project. The relevant guidelines of the funding agency AIIB are also described in this chapter. Finally, the requirements for making ESIA for this project according to DoE and AIIB are described.

Chapter III: Description of the Project

This chapter includes the background and objectives of the proposed project. The location of the project, proposed project interventions and project cost are described here. In total, this chapter gives a detailed idea about the project.

Chapter IV: Baseline Environmental and Social Data

This section provides the definition and baseline conditions or attributes of the study area and its existing physical, biological and socio-economic environment. This section presents both environmental and socio-economic aspects and draws upon both secondary and primary data collection. Maps tables, figures and plates are used to present relevant data about the study area to provide a comprehensive picture of the existing environment prior to Project implementation.

Chapter V: Analysis of alternatives

In this chapter, the alternative options of the proposed project are analyzed. It starts from no project alternative and ends at analyzing all the possible alternatives. This chapter concludes by declaring the proposed project as the best solution after analyzing all the other alternatives.

Chapter VI: Evaluation of Environmental and Social risks and impacts & Mitigation Measures

In this chapter, the possible environmental impacts due to the implementation of this project and their mitigation measures have been illustrated. Besides, the restoration process of the loss due to the project activities has also been discussed in this section. This chapter also describes mitigation measures and major residual negative impacts that cannot be mitigated and, to the extent possible, assesses the acceptability of those residual negative impacts.

Chapter VII: Labor and OSHE

This chapter includes indicating the potential risks of the project on labor and OSHE, working conditions and management of workers, and specifies assessment of GBV risks in relation to labor camps/influx.

Chapter VIII: Environmental & Social Management Plan

This chapter includes the Environmental and Social Management Plan which includes the impacts of the proposed project on the environment and society is described. All the anticipated impacts in the pre-construction stage, construction stage and operational stage are described here.

Chapter IX: Public Consultation and Information Disclosure

This section presents the outcomes of the stakeholder engagement and consultation undertaken as part of the ESIA. Different types of engagement and consultation were undertaken with different stakeholder groups including local and divisional government administrations, the local community, business and social leaders, NGO's and individuals. These were largely undertaken by one-on-one meetings, small group interviews, and focus group discussions.

Chapter X: Stakeholder Engagement Plan & Grievance Redress Mechanism

This chapter includes the detailed methodology and mechanism for stakeholder management plan and the grievances from the local people during the implementation of the project.

Chapter XI: Conclusion and recommendation This chapter includes the conclusion, and some recommendations are suggested here about the proposed project.

G. LIMITATIONS

48. A major limitation of this report is that not all substation land was purchased when survey was conducted, and distribution line routes were also not finalized. The land purchase process of BREB is a continuous process, and this ESIA report is a live document which will be updated in future. The distribution route will be determined during the detailed design stage and to some extent the route will be changed on a demand basis. Time constraints are another limitation. Despite these limitations, BREB is continuously improving the report as more information become available.

49. During the survey, river crossing tower locations were not finalized. Therefore, it was not possible to carry out surveys and surface water quality testing on these proposed rivers crossing tower locations. For baseline air quality testing was done in 2021 since most of the substation site was not finalized. So, air quality was monitored in three PBS locations in Rajshahi division and three PBS locations in Rangpur division.

50. New environmental or social issues might arise during project execution that doesn't identify in the ESIA. The report can't prescribe mitigation measures for these unforeseen circumstances. If any unforeseen situations arise then the designated E&S personnel will be updated the ESIA and ESMP.

51. Although the ESIA process includes stakeholder participation and consultation, it may not adequately address all public concerns because BREB undertook stakeholder engagement activities in 2021 before all project components were finalized. In other words, the stakeholder failed to convey the issues brought up during the consultation sufficiently. In addition, local populations will need more knowledge about the project's components which are partially compliance in this report.

II. ENVIRONMENTAL POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

A. REGULATORY REQUIREMENTS FOR THE PROJECT

52. According to the national environmental legislation of Bangladesh, all development projects are governed by legal and institutional requirements. As such, assessment of relevant legal provisions, policies, strategies, and institutional issues are very important for any project proponent or developer before execution of a program or plan. The proponent must be aware of these requirements and comply with the provisions as applicable and necessary. Before initiating any development project, it is hence required to obtain environmental clearance from DoE. Department of Environment (DoE), under the Ministry of Environment, Forests and Climate Change (MoEFCC) is the regulatory body responsible for enforcing the environmental laws and regulations like ECA'95 (amended in 2010), ECR'97 and ECR'23.

53. Regulatory requirements toward protection and conservation of environment, various environmental resources, and social environment from adverse impact of projects and activities associated with them have been enunciated by the GoB as well as the AIIB relevant requirements as summarized below.

Table II-1: Applicable National Policy/Acts/Rules

Sl No.	Policy/Acts/Rules	Key provisions and purpose	Applicability to the Project
1.	National Environment Policy, 2018	Major elements of the policy are: • Natural equilibrium provision and overall development of the country through environmental protection and sustainable management • Encourage collection and promotion of low carbon emission technology in the country. • Identifying and controlling all types of environmental pollution and degradation activities • Ensure environmental development in all fields • Ensure sustainable, long term, and environmentally friendly use of all-natural resources. • Maintain and streamline the environmental policies and strategies among other policy strategies in the interest of sustainable development. • Ensure the Environmental Impact Assessment and Strategic Environmental Assessment in all necessary sectors. • Actively involved as possible with all international environmental initiatives and take necessary actions at local and national levels.	The environmental policy aims at prevention of pollution and degradation of resources as some solid waste will be generated due to construction activities as well as some environmental pollution may be occurred due to construction of substation and other infrastructure development.
2.	National Environmental Management Action Plan (NEMAP), 1995	The NEMAP was developed with the following objectives: • to identify key environmental issues affecting Bangladesh. • to identify actions to halt or reduce the rate of environmental degradation. • to improve management of the natural environment. • to conserve and protect habitats and biodiversity. • to promote sustainable development; and • to improve the quality of life.	The plan proposes developing and applying guidelines to avoid environmental pollution due to transport and communication systems. It emphasizes different environmental pollution, hampers of natural drainage patterns, and agricultural land acquisition due to the development of the transport system.

Sl No.	Policy/Acts/Rules	Key provisions and purpose	Applicability to the Project
3.	Environment Conservation Act (ECA), 1995 (with all amendments)	The main objectives of ECA are: • Conservation and improvement of the environment; and • Control and mitigation of pollution of the environment. • The main focuses of the Act can be summarized as: • Declaration of ecologically critical areas and restriction on the operations and processes, which can or cannot be carried out/ initiated in the ecologically critical areas (ECA); • Regulations in respect of vehicles emitting smoke harmful to the environment. • Environmental clearance. • Regulation of industries and other development activities' discharge permits. • Promulgation of standards for quality of air, water, noise, and soil for different areas for different purposes. • Promulgation of a standard limit for discharging and emitting waste; and • Formulation and declaration of environmental guidelines.	According to this law, no industrial unit or project shall be established or undertaken without obtaining an Environmental Clearance Certificate from the Director General in the manner prescribed by rules.
4.	The Water Act, 2013	The Act recognizes the significance of managing all water resources in the natural flow of surface water and recharge of groundwater. The private landowners will use the surface water inside their property for all purposes per the Act. No individuals or organizations will be allowed to extract, distribute, use, develop, protect, and conserve water resources, nor will they build any structure that impedes rivers and creeks' natural flow. Electrification projects that involve laying cables underground or installing new water pumps could fall under WARPO's purview for ensuring minimal impact on groundwater resources.	To regulate the water quality during the construction phase as well as six (06) river crossings will be constructed. As most of the underground cabling used to connect with substations and substations to outgoing feeder, no ground water sources will be affected, and no clearance will require.
5.	Environment Conservation Rules, 1997 (with all amendments)	The Environment Conservation Rules, 1997, were issued by the GOB to exercise power conferred under the Environment Conservation Act (Section 20), 1995. Under these Rules, the following aspects, among others, are covered: • Declaration of ecologically critical areas. • Classification of industries and projects into four categories. • Procedures for issuing the Environmental Clearance Certificate (ECC); and • Determination of environmental standards.	Following the Environment Conservation Rules (ECR) of 1997, the Project is classified as a Red Category, requiring a complete Environmental Impact Assessment (EIA) for BREB to obtain clearance for construction. BRBE has already obtained ECC from DoE. Rule 8(1) lists PCBs as a scheduled hazardous waste, categorized as "Red List-3: Extremely Hazardous Waste. Rule 8(3) prohibits the import, manufacture, storage, sale, use, or disposal of Red List-3 waste without obtaining prior permission from the DoE.

Sl No.	Policy/Acts/Rules	Key provisions and purpose	Applicability to the Project
			Rule 12 specifies requirements for storage, labeling, and transportation of hazardous waste, which apply to PCBs in substations.
6.	Environment Conservation Rules, 2023	These rules categorize all the industries and projects as well as the types of environmental assessments that should be conducted in relation to each category of industries or projects. The ECR 1997 has been replaced by the ECR 2023.	According to ECR-2023 this project does not fall under any category.
7.	Environmental Courts Act, 2000	This Act sets out a policy for effective pursuance and completion of legal proceedings related to environmental crimes. Under this Act, the Director General of the DoE has the power to impose heavy penalties on industrial polluters who are dumping untreated wastewater into the environment or not operating their legally mandated ETPs.	According to this act, the government can take legal actions if any environmental problem occurs due to project interventions.
8.	Wetland Protection Act, 2000	The latest Wetland Act -- The Playground, Open Spaces, Gardens, and Wetland Conservation Act 2000 -- suffers from loopholes and inadequacies regarding the protection of water bodies. Section 1 of this Act suggests that it applies to the water bodies of the cities, divisional and district towns, and municipalities. The water bodies in the rural areas are outside the jurisdiction of this Act	The Act specifies the fine and imprisonment term for violation of its provisions. It does not direct the government to recover the original characteristics of the water bodies if someone fills them up.
9.	The Forest Act (1927) and the Forest (Amendment) Act (2000)	It is the main legislative context for forestry protection and management in Bangladesh. It was enacted to control trespass illegal resources extraction from forests and to provide a framework for the forestry revenue collection system	The Act is relevant to the sub-project as construction of the project intervention will require cutting some trees for distribution line.
10.	National Forest Policy (amendment), 1994	The policy is designed to conserve the existing forest areas, bring about 20 % of the country's land area under the Forestation Programme, and increase reserve forests by 10 percent per year to 2015.	The Act is relevant to the sub-project as construction of the project intervention will require cutting and trimming some trees.
11.	The Private Forests Ordinance, 1959	An Ordinance to provide for the conservation of private forests and the afforestation in some wetlands in Bangladesh.	According to Section 61 of this Ordinance, any land is required for any of the purposes of this Ordinance; such land shall be deemed to be needed for a public purpose.
12.	Bangladesh Wildlife (Conservation & Security) Act, 2012 (previously known as Bangladesh Wildlife (Preservation) Order, 1973; amended as Bangladesh Wildlife (Preservation) Act, 1974	This Act protects 1,307 species of plants and animals under four schedules that mandate imprisonment and fines for wildlife poaching, capturing, trapping, and trading.	This Act is relevant to the sub-project as an intervention may affect wildlife habitation and obstruct movement.
13.	National Water Policy, 1999	The policy emphasizes efficient and equitable management of water resources, proper harnessing and development of surface and groundwater, availability of water to all concerned, and institutional capacity building for water resource management	Measures must be taken to minimize disruption to the natural aquatic environment in streams and water channels. This act is relevant to this ESIA as six (06) river crossings will be constructed and some distribution line may

Sl No.	Policy/Acts/Rules	Key provisions and purpose	Applicability to the Project
			be traversed through the water body .
14.	National Fisheries Policy, 1999	The National Fisheries Policy focuses on aquaculture and marine fisheries development. The policy suggests, among others, that biodiversity will be maintained in all-natural water bodies and marine environment, and control measures will be taken against activities that harm fisheries, resources, and vice-versa	The project required proper action to prevent biodiversity in all-natural water bodies and the aquatic environment. This act is relevant to this ESIA as six (06) river crossings will be constructed and some distribution line may be traversed through the water body .
15.	Protection and Conservation of Fish Act 1950 (Amended 1982)	This is framework legislation with rulemaking powers. Among others, some of these rules may prohibit the destruction of, or any attempt to destroy, fish by the poisoning of water or the depletion of fisheries by pollution, by industrial effluent, or otherwise.	The project requires proper action to prevent biodiversity in all-natural water bodies and the marine environment.
16.	National Agriculture Policy, 1999	This policy aims to make the nation self-sufficient in food through increasing production of all crops, including cereals, and ensure a dependable and secure food system for all	This act is relevant to this ESIA as most of the substations' land is agricultural land and the distribution route traverses beside the agricultural land. Due to project intervention's construction activities, adequate measures should be taken to reduce waterlogging and hamper the irrigation system.
17.	National Land Use Policy, 2001	The main contents of this policy are: •Stopping the high conversion rate of agricultural land to nonagricultural purposes. • Utilizing agro-ecological zones to determine maximum land-use efficiency. • Adopting measures to discourage the conversion of agricultural land for urban or development purposes. • Improving the environmental sustainability of land-use practices.	The proposed project must adhere to this policy to ensure the environmental sustainability of land-use practices.
18.	Bangladesh Climate Change Strategy and Action Plan (BCCSAP) 2009	This is a comprehensive strategy to address climate change challenges in Bangladesh. Bangladesh Climate Change Strategy and Action Plan built on and expanded the NAPA.	Relevant as the sub-project area is prone to climate change effect. BREB always emphasize climate resilient structure.
19.	The Acquisition and Requisition of Immovable Property Act 2017 (ARIPA)	It is the principal legislation governing eminent domain land acquisition in Bangladesh. The Act requires that compensation be paid for: (i) land and assets permanently acquired (including standing crops, trees, houses); and (ii) any other damage caused by such acquisition. The Act also provides the acquisition of properties belonging to religious organizations like mosques, temples, pagodas, and graveyards if acquired for the public interest. The Ministry of Land (MoL) is the authorized government agency to undertake the process of land acquisition. The MoL partly delegates its authority about the land acquisition to the Commissioner at	The nature of the civil works related to the project like land purchased, Willing Buyer Willing Seller method have been adopted for land purchasing. However, if any land needs to be acquired in future, ARIPA 2017 need to be considered.

Sl No.	Policy/Acts/Rules	Key provisions and purpose	Applicability to the Project
		the Divisional level and the Deputy Commissioner at the District level. The Deputy Commissioners (DC) are empowered by the MoL to process land acquisition under the act and pay compensation to the legal owners of the acquired property. Khas (government-owned land) should be acquired first when a project requires both Khas and private land. If a project requires only khas land, the land will be transferred through an inter-ministerial meeting following the acquisition proposal submitted to DC or MoL. The Government of Bangladesh does not have a national policy on involuntary resettlement. The new Act of 2017 has incorporated specific provisions to address social and economic impacts that were not previously included in the 1982 land acquisition ordinance. Therefore, these provisions under the new law would reduce the gaps between the national legislative framework of the government and AIIB policies.	
20.	Public Procurement Rule,2008	This is the public procurement rules of Bangladesh, and this rule shall apply to the Procurement of Goods, Works or Services by any government, semi-government or any statutory body established under any law. Conditions of service and employment including wages and payment, the establishment of Wages Boards, employment of young people, maternity benefits, working hours, and leave; (i) Safeguard the health and safety of all workers working on the Site and other persons entitled to be on it, and to keep the Site in an orderly state and (ii) Protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of the Contractors methods of operation.	Applicable for this project such as electric cable, transformers and necessary equipment will be purchased under this project.
21.	National 3R Strategy for Waste Management, 2010	The National 3R Strategy for waste management has been established by Department of Environment in December, 2010. Sector specific strategies for promotion of 3R are depicted in this national 3R strategy. The national 3R goal for waste management is achieve complete elimination of waste disposal on open dumps, rivers, flood plains by 2015 and promote recycling of waste through mandatory segregation of waste at source as well as create a market for recycled products and provide incentives for recycling of waste.	During the construction period, some solid, non-hazardous waste may generate. So, this policy fits in this regard.
22.	Cultural Heritage	The Antiques Law of 1968 consolidates all laws relating to the preservation and protection of antiquities under the auspices of the Department of Archaeology. The law empowers the Director of the Department of Archaeology to take steps necessary for	Project activities may lead to unearthing antiques or impact cultural heritage by chance. Therefore, laws related to cultural heritage and antiques

Sl No.	Policy/Acts/Rules	Key provisions and purpose	Applicability to the Project
		antiquity's custody, preservation, and protection. The Environment Conservation rules (1997) states that GoB will consider the presence of human habitat, ancient monuments, or archeological sites, among other factors, in declaring an area as ecologically critical.	apply to this project to protect these finds.
23.	Bangladesh Labor Act (Amendment), 2013	The Bangladesh Labor Act (Amendment) Bill was enacted by parliament in 2013, to make the present legislation more time-appropriate for workers' wellbeing. The bill was approved with the conditions of legalizing trade unions in factories, assuring worker safety at work, establishing mandatory group insurance, and prohibiting children from working in dangerous environments.	To carry out the civil work, labor will be required to be hired. Therefore, these laws will be triggered to safeguard the interest of the labor, host community, project authorities, Contractors, and other project stakeholders. The project will ensure that the stipulations of the law are duly followed when it comes to labor-related activities. There is no provision for workers family to live in workers camps during project construction period as the workers camps are dedicated for only workers and it is very unusual for workers family to reside with this project worker. But there will be some female workers who need adequate sanitation and lactate facilities in workers camp. BREB always look after in this regard. No child labour will also allow in construction activities.
24.	The Building Construction Act 1952 (with subsequent amendments)	An Act to provide for the prevention of haphazard construction of building and excavation of tanks which are likely to interfere with the planning of certain areas in Bangladesh	Applicable as the project involves the development of infrastructure
25.	Electricity Act 2018	This act reveals, No license shall harm or obstruct or interfere with railways, highways, airports, waterways, canals, docks, wharves and jetties and pipes, during power generation, transmission, supply or distribution; and shall, in co-ordination with the concerned authority, take measures for protection and safety of the same. This grants the government and authorized parties the right to lay electric lines over private land, provided fair compensation is offered.	Applicable as the main theme of the project is the modernization of the electricity network and distribution of the electricity. Width of ROW varies depending on voltage level: distribution lines (≤33 kV). REB guidelines emphasize community involvement in ROW selection and negotiation to minimize local conflicts.
26.	Electricity Rules 2020	Electricity Rules has been published by the 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. As per this policy BREB shall ensure to provide compensation to project affected persons (PAPs) according to the rules.	Applicable as the main theme of the project is electricity generation and distribution

Sl No.	Policy/Acts/Rules	Key provisions and purpose	Applicability to the Project
27.	Electricity Rules 2020 (Amendment on 2022)	Electricity Rules has been amendment on 10 February 2022 and published by the 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. As per this policy BREB shall ensure to provide compensation to project affected persons (PAPs) according to the rules.	Applicable as the main theme of the project is electricity generation and distribution
28.	GoB 8th Five Year Plan, 2021-25	The preparatory process of the 8th Five Year Plan is marked by the infestation of major global catastrophe 'COVID-19', which has caused consequential economic conundrum across the world. The Eighth Five Year Plan is unique compared to its preceding two plans as it blends the COVID-19 recovery strategies in the macroeconomic framework as well as developing sectoral strategies in the plan	Applicable as the project involves the development of infrastructure
29.	Water Resource Planning Act, 1992	An Act was made to ensure the development and balanced use of water resources. The Institution shall have the following functions; • To conduct the general planning of environmentally balanced water resources for the purpose of developing water resources. • To determine the national means and methods for the scientific utilization and preservation of water resources. • To give advice to other institutions involved in the development, utilization and preservation of water resources.	As the project proponent consists of six river crossing towers and some distribution line traverse beside some river this policy is applicable.
30.	Power System Master Plan, 2016	To show the targets and approach in the Energy and Power Sectors in order to achieve Bangladesh's national goal: to achieve VISION2041 and become a high-income country by 2041.	Enhancement of imported energy infrastructure and its flexible operation. Efficient development and utilization of domestic natural resources (gas and coal)
31.	National Water Management Plan, 2001 (Approved in 2004)	The plan provides a framework within which all concerned with the development, management, and use of water resources water services in Bangladesh can plan and implement their own activities in a coordinated and integrated manner. The planned activity programs have been presented in the eight sub-sectoral clusters: i) Institutional Development, ii) Enabling Environment, iii) Main River, iv) Towns and Rural Areas, v) Major Cities; vi) Disaster Management; vii) Agriculture and Water Management, and viii) Environment and Aquatic Resources. Each cluster comprises of a number of individual programs.	As the project proponent consists of six river crossing tower. This policy is applicable.

Sl No.	Policy/Acts/Rules	Key provisions and purpose	Applicability to the Project
32.	E-waste management Rules 2021	On June 10, 2021, Bangladesh's Department of Environment (DOE) published the Hazardous Waste (e-waste) Management Rules, 2021 under the Bangladesh Environmental Protection Act, 1995. The main provisions of this regulation are as follows. • Registered manufacturers, recyclers, etc. shall obtain environmental clearance in accordance with the Bangladesh Environmental Protection Rules, 1997. • Manufacturers have to establish individual or joint collection centers and set aside funds for the management of WEEE.	As the project proponent may create some E-waste
33.	Solid Waste Management Regulations 2021	The Solid Waste Management Regulations 2021 were published in Bangladesh on December 23, 2021, under the Bangladesh Environmental Protection Act, 1995. The Regulations define the responsibilities of businesses involved in solid waste management and impose collection, recycling, and disposal obligations according to Extended Producer Responsibility (EPR) on manufacturers of non-biodegradable products such as glass, plastic, and bottles. The Regulations also include provisions for the treatment of solid waste such as composting and energy recover	As the project proponent may generate some E-waste
34.	Bangladesh Fire Service and Civil Defense Act, 2013:	This is the comprehensive law that established the legal framework for fire prevention, firefighting, and civil defense in Bangladesh.	This law establishes safety regulations for buildings and infrastructure, including fire prevention and emergency response plans relevant to electrical safety.

B. INTERNATIONAL CONVENTIONS, TREATIES AND PROTOCOLS (ICTPS)

54. Bangladesh is a party to several international conventions; treaties and protocols (ICTPs) related to the Project and are committed to ensuring that these protocols are complied with during all development works. The five applicable ICTPs that BR is also aware of and is complying with are enumerated in Table II-2.

Table II-2: International Conventions, Treaties and Protocols Signed by Bangladesh

Conventions	Years	Ratified/Accessed (AC)/Accepted (AT)/ Adaptation (AD)	Relevance
International Plant Protection Convention (Rome,) & Plant Protection Agreement for SE Asia and Pacific (1999 Revision)	1951	01.09.1978 04.12.1974 (AC) (Entry into Force)	Ensuring that the Project work or construction materials do not introduce plant pests
Convention on Wetlands of International Importance ("Ramsar Convention":1971)	1999	20.04.1992 (ratified)	Protection of important wetlands and prevention of draining or filling during construction

Conventions	Years	Ratified/Accessed (AC)/Accepted (AT)/ Adaptation (AD)	Relevance
Convention Concerning the Protection of the World Cultural and natural Heritage (Paris, 1972)		03.08.1983 (AT) 03.11.1983 (ratified)	Prevention of damage or destruction of cultural and/or historically significant sites, monuments, etc.
Convention on Biological Diversity, (Rio de Janeiro, 1992.)	1992	05.06.1992	Protection of biodiversity during construction and operation.
Convention on Persistent Organic Pollutants, Stockholm.	2001	In process	Restrict the use of different chemicals containing POPs.
United Nations Framework Convention on Climate Change, (New York, 1992.)	1992	15.04.94	Reduction of emission of greenhouse gases.
Convention on Biological Diversity, (Rio De Janeiro, 1992.)	1992	03.05.94	Conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.
Kyoto protocol to the United Nations Framework Convention on Climate Change		21.8.2001 (AC) 11.12.1997 (AD)	Reduction of emission of greenhouse gases.
Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters (as amended), London-Mexico City-Washington	1972	Signed	Effective control and prevention of all sources of pollution of the sea by the dumping of waste and other matters that is liable to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea.
Convention Concerning the Prevention and Control of Occupational Hazards caused by Carcinogenic Substances and Agents, Geneva.	1974	Signed	To protect workers against hazards arising from occupational exposure to carcinogenic substances and agents.
Convention Concerning the Protection of Workers Against Occupational Hazards in the Working Environment due to Air Pollution, Noise and Vibration, Geneva	1977	Signed	Protection of workers' health against occupational hazards in the working environment due to air pollution, noise and vibration.
Convention on the Conservation of Migratory Species of Wild Animals, Bonn.	1979	Signed	Conservation and sustainable use of migratory animals and their habitats
Convention Concerning Occupational Safety and Health and the Working Environment, Geneva.	1981	Signed	Ensuring occupational health and safety of workers in all branches of economic activity.
Vienna Convention for the Protection of the Ozone Layer, Vienna	1985	02.08.90 (AC) 31.10.90 (entry into force)	Preventing human activities that may have adverse effects on ozone layer.
Convention Concerning Occupational Health Services, Geneva.	1985		Convention Concerning Occupational Health Services, Geneva.
Convention Concerning Safety in the Use of Chemicals at Work, Geneva.	1990	Signed	Regulating the management of chemicals in the workplaces In order to protect workers from the harmful effects of these substances.
London Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, London.		18.03.94 (AC) 16.06.94 (entry into force)	To strengthen the control procedure and extend the coverage of Montreal Protocol to new substances.

Conventions	Years	Ratified/Accessed (AC)/Accepted (AT)/ Adaptation (AD)	Relevance
Preparedness, Response and Cooperation (London, 1990.)30.11.90United Nations Framework Convention on Climate Change, New York	1992	15.04.94	Achieving stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.
Convention on Biological Diversity, Rio De Janeiro	1992	03.05.94	Conservation of biological diversity (or biodiversity) and sustainable use of its components.
Agenda 21, UNCED, Rio de Janeiro	1992	Signed	Ensuring sustainable development.

Source: MoEFCC, 2013

C. ASIAN INFRASTRUCTURE INVESTMENT BANK (AIIB) ENVIRONMENT AND SOCIAL FRAMEWORK AND STANDARDS

55. The AIIB Environmental and Social Framework (ESF), 2022 provides an overview of the AIIB concerning (a) environmental and social sustainability; and (b) its role in meeting the challenge of sustainable development in Asia. The pursuit of complete objectives of development is framed within the ESF in terms of both local impacts, and global challenges, especially in climate change. ESF provides general specifications, standards, and objectives, that clients should adhere to during project preparation and implementation. Thus, the ESF attaches importance to the country's regulatory systems as sources of legally binding procedures and standards.

56. The Environmental and Social Policy (ESP) in the ESF comprises essential environmental and social requirements for each project and is accompanied by: (a) three associated mandatory Environmental and Social Standards (ESSs) setting out requirements applicable to clients on, respectively, Environmental and Social Assessment and Management, Land Acquisition and Involuntary Resettlement and Indigenous Peoples; (b) an Environmental and Social Exclusion List (ESEL); and (c) a Glossary of certain terms used in the ESP and ESSs.

57. The three ESSs mentioned in the ESP are, ESS 1: implementation of environmental and social assessment and management, ESS 2: prevent/minimize involuntary resettlement and ESS 3: protection of vulnerable/indigenous people. These standards require clients to implement structured processes of impact assessment, planning, and mitigation to address the adverse effects of projects throughout the project cycle. Together, the ESP and the ESSs comprise an environmental and social management approach designed to: (i) ensure environmental and social screening and categorization, (ii) analyze future project environmental and social threats, and impacts; (iii) identify measures to prevent, reduce, mitigate, cover or make up for project environmental and social impacts; (iv) provide a process to consult the public on environmental and social risks and impacts of projects and to disclose information.

58. The AIIB classifies all its projects into four categories. The project is categorized as Category A if it is likely to have adverse environmental and social impacts that are irreversible, cumulative, diverse or unprecedented and requires the client to conduct an Environmental and Social Impact Assessment (ESIA) with Environmental and Social Management Plan (ESMP). A project is categorized as Category B when: it has a limited potentially adverse environmental and social impacts; the impacts are not unprecedented; few if any of them are irreversible or cumulative; they are site-specific; and can be successfully managed using good practice in an operational setting and requires clients to conduct an initial review of the environmental and social implications of the Project. A Project is categorized as C when it is likely to have minimal

or no adverse environmental and social impacts and the client is required to prepare a review of the environmental and social aspects of the Project. A Project is categorized FI if the financing structure involves the provision of funds to a financial intermediary (FI) for the Project, whereby the Bank delegates to the FI the decision-making on the use of the Bank funds, including the selection, appraisal, approval and monitoring of Bank-financed subprojects. The Bank requires the FI to develop and apply an appropriate ESMS that is proportional to the environmental and social risks associated with the Bank-supported portfolio, is consistent with this ESP, excludes Bank support activities covered in the ESEL and incorporates applicable provisions of the ESSs.

1. Key Elements of Environmental & Social Framework

59. 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) and Environmental and Social Exclusion List. 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

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

61. **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 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.

62. **Environmental and Social Standard 2 (ESS 2):** 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 defined detailed requirements of resettlement planning of the projects involving involuntary resettlement.

63. **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 consideration of these characteristics, national legislation, customary law and any international conventions to which the country is a party may be considered. 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.

64. AIIB requires the client to establish, in accordance with the ESP and applicable ESSs, a suitable grievance mechanism to receive and facilitate resolution of the concerns or complaints of people who believe they have been adversely affected by the Project's environmental or social impacts, and to inform Project-affected people of its availability. People who believe they have been or are likely to be adversely affected by a failure of the Bank to implement the ESP may also submit complaints to the Bank's oversight mechanism in accordance with the policies and procedures to be established by the Bank for such mechanism.

65. ESF 2022 has also provisions for identify measures to avoid, minimize, or mitigate potentially adverse impacts on and risks to physical, biological, socioeconomic, and cultural resources, safety of both workers and affected community and natural resources during the design, construction, operation, and decommissioning of the project.

2. Applicability of AIIB ESS

66. Modernization & Capacity Enhancement of BREB Network (Rajshahi-Rangpur) project triggers the local environmental and social laws and regulations and also the ESP and ESS of AIIB. Under this project, ESS 1: Environmental and Social Assessment and Management and ESS 2: Involuntary Resettlement are applicable. The ESIA (this study) addresses ESS1 and RPF addresses ESS 2. Standards on Indigenous Peoples (ESS 3) is also triggered by the proposed project as indigenous communities (Santal and Orao) have been identified in accordance with the land audit who are resided in 5 substations within the range of 1km radius from the center of the substation.

67. The Bank requires its clients to manage the environmental and social risks and impacts associated with its project in a manner designed to meet the ESP and the applicable ESSs. The present ESIA has been developed in compliance with ESS 1. The applicability of ESP and ESSs for the proposed project is presented in Table II-3.

Table II-3: Applicability of AIIB ESS

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. The present EISA has been conducted in compliance with ESS 1.
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. Given such impacts, though low intensity in nature, ESS 2 is triggered.
ESS 3	Indigenous Peoples	ESS 3 is applicable if Indigenous People are present in the project area and they	Yes. The project involves two indigenous community, so ESS-3 is triggered.

D. PROJECT CATEGORIZATION BY GOB

68. Under the ECR 1997, a classification system was established for development projects and industries based on the location, the size, and the severity of potential pollution. There are four categories of projects: green, orange A, orange B and Red with respectively no important, minor important, medium important and severe environmental impacts. According to the guidelines illustrated in the ECR, this project falls under the red category of projects.

69. "Red Category: According to ECR-97 of DoE "Water, power and gas distribution line laying/relaying/extension"" projects fall under Red category; Red category project needs to conduct IEE and EIA and submit the report to DoE for ECC."

70. Therefore, for this project, it needs to prepare an IEE and EIA in due course following prescribed format and be submitted to the DoE for getting the ECC of the project. The EIA should include the prediction, evaluation and mitigation of environmental impacts and an EMP.

71. BREB has got Environmental Clearance Certificate (ECC) from DoE as per ECR 1997 and further renewal also done. But the proposed project does not classify under any category for substation or distribution line construction as per new ECR 2023.

E. CATEGORIZATION BY AIIB

72. The Bank determines the Project's category based on the Project's component presenting the highest environmental or social risk and potential impacts (including direct, indirect, cumulative, and induced impacts, as relevant, in the Project area). The Bank assigns each proposed Project to one of the following four categories and determines the type of assessment and instrument required:

1. Category-A
2. Category-B
3. Category-C
4. Category-FI

73. The AIIB Environmental and Social Framework determines the project category by the type of project's component presenting the highest environmental or social risk, including direct, indirect, cumulative and induced impacts, as relevant, in the project area. The Environmental and Social Standards mentioned in the ESP covers environmental and social assessment and management, involuntary resettlement, and vulnerable/indigenous people. These standards require clients to implement structured processes of impact assessment, planning, and mitigation to address the adverse effects of projects throughout the project cycle. Together, the ESP and the ESSs comprise an environmental and social management which require that: (i) environmental and social screening and categorization is ensured early, (ii) future project environmental and social threats and impacts are analyzed; (iii) measures are identified to prevent, reduce, mitigate, cover or make up for project environmental and social impacts; (iv) a process to consult the public on environmental and social risks and impacts of projects and to disclose information is provided. The ESF applies to all AIIB-financed projects, including private sector operations, and to all project components.

74. Due to the nature and small scale of this project, the project has been classified as category B project based on AIIB ESF-2022. Category B refers to proposed projects if it is likely to have a limited number of potentially adverse environmental and social impacts; the impacts are not unprecedented; few if any of them are irreversible or cumulative; they are site-specific; and can be successfully managed using good practice in an operational setting. For this category, the Bank determines the appropriate environmental and social assessment documentation the Client is required to prepare on a case-by-case basis. If the Bank determines that this Project has limited impacts with well-known mitigation and monitoring measures, it may decide that the only required environmental and social assessment

document is an ESIA, ESMP or ESMPF (or both, as applicable), or another Bank-approved document.

F. GAP ANALYSIS BETWEEN AIIB'S REQUIREMENTS AND NATIONAL LAWS

75. As part of the E&S capacity assessment of IAs, a gap analysis between AIIB's ESSs and GoB Regulations was performed. The gap analysis revealed that Bangladesh's ES risk assessment and management system for development projects is open-ended, but, like other countries' EIA systems, does not cover all of the AIIB ESF's ES Standards. The ECA/ECR does not even define the scope of the EIA study (or the IEE), leaving that to the EIA preparation to determine through initial assessment/screening. The scope of the ESIA study would thus be determined by the expertise of the EIA team or the DoE reviewers. There is no guarantee that each ESS Standard (1-3) is taken into account in the ESIA study and the development of the ESMP. Despite the fact that ESIA is heavily weighted toward environmental issues, more and more social issues are being incorporated into the assessment. Furthermore, under normal circumstances, the practice does not include labor management issues. Another critical gap is the absence of provisions requiring the development of project-specific ES management plans. In the case of non-titled entities, the eminent domain land acquisition system, for example, does not require the preparation of a RAP. In addition, the projects are not required to develop their own Labor Management Procedures/Plans. Because of the gaps, this ESIA will adhere to the most stringent standards and requirements.

76. Table II-4 below provides an overview of the gaps between GoB laws and AIIB's ESSs, as well as steps to close those gaps.

Table II-4: Gaps Between GoB Laws and AIIB ESSs

AIIB's ESF Standard	Objectives	Requirements	Applicability	Gaps	Gap Minimization
ESS1: Environmental and Social Assessment and Management	• Identify and assess potential environmental and social risks and impacts of projects. • Develop and implement measures to avoid, minimize, mitigate, or compensate for adverse impacts. • Manage environmental and social risks and impacts throughout the project cycle. • Enhance stakeholder engagement and information disclosure.	• Conduct environmental and social impact assessment (ESIA) for projects with potential significant impacts. • Develop an Environmental and Social Management Plan (ESMP) to address identified risks and impacts. • Implement environmental and social management measures during project implementation. • Monitor and report on environmental and social performance. • Engage stakeholders meaningfully in the assessment and management process.	ESS 1 is applicable if the Project is likely to have adverse environmental risks and impacts or social risks and impacts (or both)	(i) EIA study screening and scoping do not guarantee coverage of all ESS standards in the assessment. (ii) EIA study does not advocate to include both the environment and social impacts at same scale but the ESF does. (iii) The stakeholder engagement during the conduct of the EIA is limited and the EIA report is not disclosed. (iv) The EIA system in Bangladesh does not require analysis of alternatives.	ESIA has suggested to follow the ESS1 requirements, given in the relevant sections of Environmental Management Procedures.
ESS2: Involuntary Resettlement	• Avoid or minimize involuntary resettlement wherever possible. • Ensure that displaced persons are compensated fairly and assisted in improving or at least restoring their livelihoods and living standards. • Implement resettlement in a manner that is consistent with applicable laws and regulations, and with international best practices.	• Prepare a Resettlement Plan (RP) that outlines resettlement and compensation measures for affected people. • Conduct a census of affected people and assets. • Provide compensation for lost assets at replacement value. • Assist displaced persons with relocation and livelihood restoration. • Monitor and evaluate resettlement outcomes.	ESS 2 is applicable if the project is likely to cause involuntary resettlement impacts.	Bangladesh: ARIPA (i) does not require the preparation of RAP in case of titled and non-titled entities. (ii) does not provide compensation or assistance to those who do not have formal legal claim to the land; (iii) does not provide transitional allowances for restoration of livelihoods for informal settlers. (iv) relies on cash compensation.	A RPF has been prepared which will be followed in the project.

AIIB's ESF Standard	Objectives	Requirements	Applicability	Gaps	Gap Minimization
				(v) no provision to give special attention to the vulnerable groups (vi) valuation of lost asset is not based on "replacement cost' standard	
ESS3: Indigenous People	• Respect the rights of Indigenous Peoples, including their rights to land, territories, and resources, as well as their cultural and social identity. • Ensure that Indigenous Peoples receive culturally appropriate social and economic benefits from projects. • Avoid adverse impacts on Indigenous Peoples and their communities.	• Conduct a process of free, prior, and informed consultation (FPIC) with Indigenous Peoples affected by projects. • Develop an Indigenous Peoples Plan (IPP) that addresses potential impacts and benefits for Indigenous Peoples. • Implement measures to protect Indigenous Peoples' rights and interests, including cultural heritage and traditional knowledge. • Monitor and evaluate project impacts on Indigenous Peoples.	ESS 3 is applicable if Indigenous People are present in the project area and they are likely to be affected by the project.	No equivalent requirements on: (i) coverage of IP impacts in the ESIA; (ii) special treatment or differentiated approach to IPs and vulnerable groups; (iii) conduct of FPIC; (iv) development of IP Plan.	BREB will prepare Indigenous Peoples plan (IPP) and Indigenous Peoples planning framework (IPPF), which is provided to the Bank as a freestanding document. The IPP or IPPF complements the broader coverage of social risks and impacts in the environmental and social assessment and provides specialized guidance to address specific issues associated with the needs of affected Indigenous peoples

G. GOB ENVIRONMENTAL CLEARANCE

77. Formal EIA guidelines in Bangladesh are set out in "Rules and Regulations under the 1995 Environmental Protection Acts" as published in the Official Gazette on August 27, 1997. Any proponent planning an industrial project is currently required under Paragraph 12 of the Environmental Protection Acts, 1995 to obtain "environmental clearance letter:" from the Department of Environment.

78. Steps to be followed for obtaining the Environmental Clearance Certificate for this electricity distribution project are shown in Figure II.1 as the project is under 'Category Red' and to prepare a full EIA prior to implementation of such project for approval.

79. BREB has already got the Environmental Clearance Certificate (ECC) from DoE on 30 December 2021 in accordance with ECR-1997. But according to ECR-2023 there is no criteria for substation construction as well as distribution line. So, there is no legal provision and SCC/ECC requirements for this project according to new ECR 2023.

80. Under the ECR 2023, a classification system has been established for development projects and industries on the basis of the location, the size, and the severity of potential pollution. There are four categories of projects: Green, Yellow, Orange, and Red with respectively no, minor, medium, and severe environmental impacts.

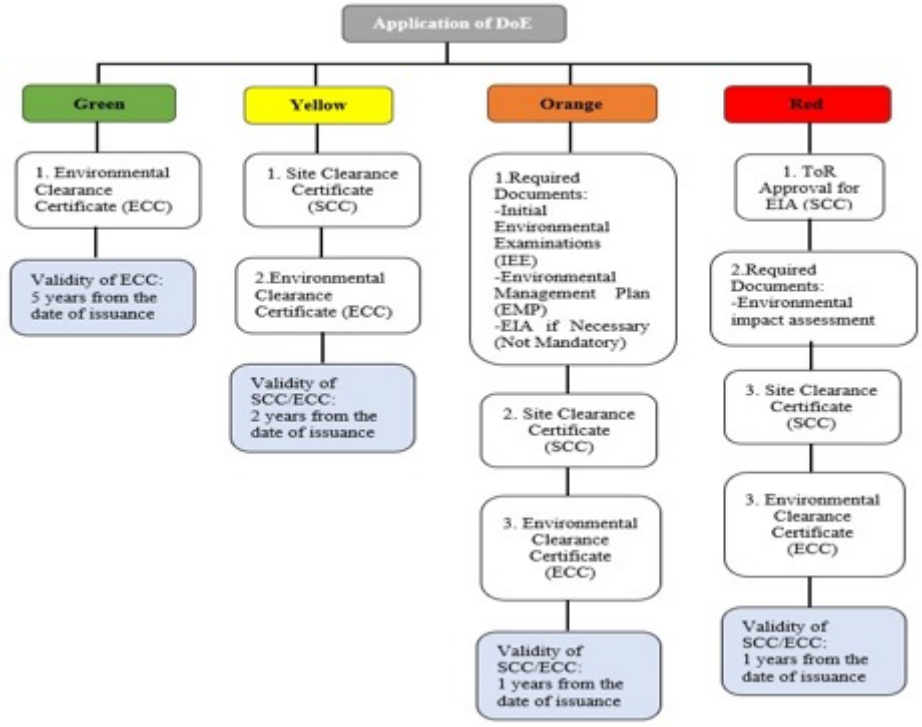

Figure II.1: Government of Bangladesh Environmental Assessment Process

H. COMPLIANCE WITH BREB HEALTH ENVIRONMENTAL AND SAFETY (HES) REQUIREMENTS

81. The BREB has its own policy and requirements for compliance relating to environment, health, and safety issues for its operations. The company is committed to managing its operations in a safe, efficient, and environmentally responsible manner. The BREB's Health Environment and Safety (HES) manuals, guidelines, procedures, and plans are important tools of their commitment. HES manuals include:

- Environmental Impact Assessment Module,
- Guideline on Integrated Impact Assessment,
- Health Impact Assessment Module, and
- Social Impact Assessment Module

82. In addition, the requirement for impact assessment is affirmed in the BREB's Statement of General Business Principles. The BREB is committed to:

- Pursuing the goal of no harm to people,
- Protecting the environment, and
- Managing HES as any other critical business activity.

83. BREB has its own instruction manual (PBS INSTRUCTION: 100-30[1] & 100-29[2]) for Substation/ Distribution network Operation, Inspection and Maintenance. As well as Emergency Procedure and Management has been given in BREB PBS INSTRUCTION: 100-75[3]. also follow a training manual/guideline of safety working procedure for distribution network operation.

I. WILLING BUYER WILLING SELLER PROCEDURES APPLICABLE TO THE PROJECT

84. The BREB always followed the willing buyer and willing seller mechanism for the BREB projects. Under the willing buyer and willing seller mechanism, suitable land will be identified by PBS and will be purchased accordingly for future substations. The steps are given below:

- PBS finds the locality where a substation shall be located and identifies several slots.
- PBS researches the ownership status of the slots and consults with owners to check their will for negotiation and selling.
- Once the owners confirm their will, then the negotiation will start. Meanwhile PBS collect market rates and recent transaction details around the area.
- Through the negotiation, the contract details and amount to be paid for purchasing land are decided.
- PBS pays advance payments to the seller and a land purchase intention deed (baina deed) is prepared, if necessary, and registered with the local Land Office. This Baina deed is valid for 3 months.
- Within 3 months, a sale deed is prepared and registered with the Land Registration Office. During registration the remaining amount is paid by cheque to the seller. and the amount shall be transferred to the owners after verification of the ownership documents.
- PBS receives the sale deed from the Land Registration Office. This deed is kept at the PBS local office. Later the Land Dept updates their records. From then on land belonged to PBS. The “necessary fees” referenced in this paragraph to register the deed will be paid by the PBS.

85. Respective PBS will ensure that the price of the land needs to be at least equal to the prevailing and actual market price in the area or three times the registration value whichever is higher. PBS will verify the land ownership, possession, interested parties, documents, etc. with the help of the land office. After completion of verification, PBS, and seller both will communicate this decision to the land office, Department of Land. The seller, with the assistance of Surveyor from local registration office, gets the land surveyed and demarcated in the presence of adjoining landowners. Disputes and claims if any will be resolved then and there. After verification, PBS calls a meeting with the seller where all the information about the

[1] BREB. 2020. PBS Instruction 100-30.
[2] BREB .2020. PBS Instruction 100-29
[3] BREB. 2020. PBS Instruction 100-75

land is shared and discussed and if the seller agrees, then PBS will proceed further to purchase the land. The entire process of consultation, negotiation, agreement, transfer of land documents will be recorded by the PBS and will be available for review by AIIB. At any point of time during the process, the seller will have the right to refuse to sell. It is, however, willing buyer-willing seller, if when the seller refuses to sell, the PBS will change the location and ask another seller. There will be no expropriation in case of failure of negotiation.

86. All potentially affected individuals are meaningfully consulted, informed of their rights, and provided with reliable information concerning environmental, economic, social and food security impacts of the proposed investment. The PBS officials will make the best effort to address risks of asymmetry of information and bargaining power. They are enabled to negotiate fair value and appropriate conditions for the transfer and to have access to grievance redress mechanisms are put in place. There will be an independent third party engaged to document negotiation and settlement processes.

III. DESCRIPTION OF THE PROJECT

A. GENERAL

87. According to the power system master plan (PSMP-2016) of the Bangladesh Government, BREB has to cover a supply of 13,500 MW by the year 2025 and 18,200 MW of electricity by 2030. To cater for those expected loads BREB has to ensure a robust distribution system capacity of 28,000 MW within 2025, but the BREB network holds only up to 14500 MW at present which is miles behind the target. BREB has targeted to take modernization and capacity enhancement projects in each division to meet the projected demand & ensure uninterrupted, reliable, quality, and affordable electricity supply for all. AIIB has agreed to finance the modernization and capacity in hands mint through the project in modernization and capacity enhancement of BREB network (Rajshahi-Rangpur Division).

88. BREB has carried out Environmental and Social Impact Assessment study for aforesaid 21 PBS's of Rajshahi-Rangpur under the name of 'Modernization and Capacity Enhancement of BREB Network (Rajshahi-Rangpur Division) Project'. BREB is willing to initiate a modernization and capacity enhancement project in 21 Palli bidyut samity (PBS) such as Bogura-1 PBS, Bogura-2 PBS, Chapai-nawabganj PBS, Joypurhat PBS, Naogaon-1 PBS, Naogaon-2 PBS, Natore-1 PBS, Natore-2 PBS, Pabna-1 PBS, Pabna-2 PBS, Rajshahi PBS, Sirajgonj-1 PBS, Sirajgonj-2 PBS, Dinajpur-1 PBS, Dinajpur-2 PBS, Gaibandha PBS, Kurlalmoni PBS, Rangpur-1 PBS, Rangpur-2 PBS And Thakurgaon PBS in Rajshahi-Rangpur Division.

B. NEED FOR THE PROJECT

89. The Bangladesh would not have been able to achieve the desired yearly GDP growth rate if power penetration in rural regions had not been improved. The BREB's operations are not limited to the RE program; it has been noted that the number of industries and commercial consumers in rural regions is rapidly increasing. At present BREB is rendering its services through 80 PBSs and BREB has already achieved 99% electrification connecting 3.04 crore consumers (meters). To do that it has to install 963 substations of capacity 16237 MVA and has already been erected 5.24 lakh km distribution lines.

90. The purpose of the proposed project is to improve the quality of electricity supply to existing consumers, to allow capability for consumer growth and to minimize system losses and also future demand of electricity, modern & sustainable electricity distribution network for the growing electricity demand in 21 PBSs authorities of Rajshahi-Rangpur region. Therefore, the broad objective is to provide more access to electricity, and thereby boost economic development and reduce poverty in the rural areas. This will also result in improving the financial soundness of the concerned PBS with increased income generation from new consumer connections. The project should contribute to the national economy through added production in the agriculture and industry sectors, with the expansion of industries and business, and by the creation of additional employment.

C. OBJECTIVES OF THE PROJECT

91. The main objectives of the project are given below:

- Provide electricity in rural areas for accelerating economic activities.
- Identify the future demand of electricity up to the year 2025 & 2030 for 21 PBSs of Rajshahi-Rangpur Division.
- Design a modern & sustainable electricity distribution network for the growing electricity demand and resource requirement for the purpose of supplying un-interrupted, reliable, quality and affordable electricity for all.

- To upgrade and enhance 1385 MVA capacity of rural electrical distribution network by 30 June 2028 to meet-up increasing demand of electricity in the project areas.
- To access an uninterruptible, reliable, affordable & efficient power supply for 8.6 million existing consumers reducing 2.15% system loss and 15% SAIDI.

Target:

- To construct 84 nos. of +1,190 MVA 33/11 kV new Substations
- To upgrade (Augmentation) 32 nos. of 33/11 kV (total +195 MVA extension) existing Substations
- To construct 6,465 km of 33 kV & below voltage line (New/ Upgradation/ Underground line).
- Installation of 4,800 km Insulated Conductor
- Conversion of 3,350 km LT to HT line
- Conversion of 4,560 km HT 1-ph to HT 3-ph line
- To construct 06 sets of River Crossing Tower
- Installation of SCADA System for 5 Substations in Rangpur PBS-1
- Reconstruction of 314 km line in flood prone area.
- Installation of 4,990 fault locator.

D. DESCRIPTION OF THE PROJECT ACTIVITIES

92. BREB Has planned to alleviate the overall condition of the North-western part of Bangladesh that is the division 100% uninterrupted insufficient electricity supply. With this in view, 21 PBSs has been selected under division to strengthen the electricity supply. In the earlier times due to lack of proper transport system and communication, load growth was not increased in this particular area. But currently with better connectivity, BREB has adopted a new model.

93. BREB holds the capacity to cater to 8,700 MW load at present, which is far behind the target. At present, for all the 80 PBSs the aforesaid master plan cannot be implemented unless its capacity is enhanced. Existing overloaded distribution lines and substations are required to be upgraded & the total power networking system is to be modernized to meet and to provide improved quality deliverable power at the consumer end. BREB has, therefore, targeted to take modernization and capacity enhancement projects in each division to meet the projected demand & to ensure un-interrupted, reliable, quality, and affordable electricity supply for all. According to Modernization & Capacity Enhancement Project, the list of proposed substations approved by SE&D are given in the following table III-1:

Table III-1: Proposed Location of the Planned/ New Substations

SL. No	Name of S/S	Voltage Level (kV)	Capacity (MVA)
Bagra PBS-1			
1	Bogra-3	33/11	10
2	Kahalu-2	33/11	10
3	Kahalu-3	33/11	10
4	Dupchachia-2	33/11	10
5	Adamdighi-2	33/11	10
6	Nandigram-3	33/11	10
7	Shibganj-4	33/11	10
Bogra PBS-2			
1	Gabtoli-3	33/11	10
2	BEZ	33/11	10
3	Dhunot-2	33/11	10
4	Shajahanpur-2	33/11	10

SL. No	Name of S/S	Voltage Level (kV)	Capacity (MVA)
5	Gabtoli-4	33/11	10
6	Dhunot-3	33/11	10
7	Sherpur-4	33/11	10
Joypurhat PBS			
1	Joypurhat-4	33/11	10
2	Yet nor decided	33/11	10
Naogaon PBS-1			
1	Bodolgachi-2	33/11	10
2	Noagaon-4	33/11	10
3	Manda-4	33/11	10
Naogaon PBS-2			
1	Yet not decided	33/11	10
2	Yet not decided	33/11	10
3	Yet not decided	33/11	10
Natore PBS-1			
1	Singra-4 (Bamihal S/S)	33/11	10
2	Bagmara-5 (Jhikra)	33/11	10
3	Bagmara-4 (Gonipur)	33/11	10
4	Puthia-3 (Mollapara S/S)	33/11	10
5	Natore-4 (Dhalan S/S)	33/11	10
6	Yet not decided	33/11	10
Natore PBS-2			
1	Gurudaspur-3 (Shahibazar)	33/11	10
2	Lalpur-2 (Berilabari)	33/11	10
3	Charghat (Holdigachi)	33/11	10
4	Bagha-2 (Mirgong)	33/11	10
5	Lalpur-4 (Koloshnagar)	33/11	10
Pabna PBS-1			
1	Chatmohor-3 (Pachuria)	33/11	10
2	Bhangura-3 (Parmandapur)	33/11	10
3	Atghoria-3 (Khidirpur)	33/11	10
4	Pabna Sador-3 (Hemayetpur)	33/11	10
Pabna PBS-2			
1	Bera-3 (Koitola)	33/11	10
2	Santhia-3 (Dhulauri)	33/11	10
3	Pabna-3 (Dhublia)	33/11	10
4	Pabna-4 (Dhormogram)	33/11	10
Sirajganj PBS-1			
1	Ullapara-7 (Mohonpur)	33/11	10
2	Tarash-3 (Gulta)	33/11	10
3	Raigonj-4 (Dhangora)	33/11	10
Sirajgonj PBS-2			
1	Belkuchi-5 (Subarnachara)	33/11	10
2	Shirajganj-4 (Soydabad)	33/11	20
3	Kajipur-3 (Sonamukhi)	33/11	10
4	Shirajganj-5 (Saluavita)	33/11	10
Rajshahi PBS			
1	Durgapur	33/11	10
2	Godagari	33/11	10
3	Tanore (Kolma)	33/11	10
Chapainawabganj PBS			
1	Yet not decided	33/11	10
2	Yet not decided	33/11	10
3	Yet not decided	33/11	10
Dinajpur PBS-1			

SL. No	Name of S/S	Voltage Level (kV)	Capacity (MVA)
1	Bochaganj (Bochaganj)	33/11	10
2	Dinajpur-4 (Kauga)	33/11	10
3	Chirirbandar -3 (Amtali)	33/11	10
Dinajpur PBS-2			
1	Ghoraghat-2 (Chakbamunia)	33/11	10
2	Nobabganj-3 (Bajitpur)	33/11	10
3	Birampur-3 (Ketrahat)	33/11	10
Kuri-Lal PBS			
1	Fulbari-1	33/11	10
2	Lalmonirhat-1	33/11	10
3	Aditmari-2	33/11	10
4	Kurigram-2	33/11	10
5	Rajarhat-2	33/11	10
Nilphamari PBS			
1	Kishorgeonj-2	33/11	10
2	Dimla-2	33/11	10
3	Joldhaka-2	33/11	10
Rangpur PBS-1			
1	Mithapukur-5	33/11	10
2	Sadullapur-2	33/11	10
3	Pirgacha-3 (Chahola)	33/11	10
Rangpur PBS-2			
1	Saidpur-1 (Khatamodhupur)	33/11	10
2	Rangpur-6 (Tampat)	33/11	10
3	Kaunia-3 (Mirbag)	33/11	10
4	Gangachara-3 (Esli)	33/11	10
5	Taraganj		10
6	Badarganj-3 (Laldighi)	33/11	10
Thakurgaon PBS			
1	Thakurgaon-5	33/11	10
2	Thakurgaon-7	33/11	10
3	Balaidanga-2	33/11	10
4	Panchogar-2	33/11	10
5	Autoari-2	33/11	10
Gaibandha PBS			
1	Saghata-2 (Barkona)	33/11	10
2	Polashbari-2 (Ghorabandha)	33/11	10

Table III-2: Specific item wise breakdown of the Planned/ New Substations

SL	Division	District	Upazila/ Thana/ City Corporation / Pourashava	Major Items/ Components														
				Name of PBS	33 kV and below voltage line (new /upgradation) (km)	33 kV Underground cable (km)	11 kV Underground Cable (km)	Insulated conductor(km)	LT to HT Conversion, (km)	HT 1 Ph to HT 3 Ph conversion (km)	Rehabilitation of line in flood prone area (km)	River crossing Tower (Set)	33/11 kV Sub-Station					
													New			Augmentation		
													No. (20 MVA)	No. (10 MVA)	Total (MVA)	No.	MVA	(Increased MVA)
1	2	3	4	5	6	7	8	9	10	11	12	13	14			15		
1	Rajshahi	Bogura Bogura Bogura Bogura Bogura Bogura	1 Bogura 2 Kahalu 3 Dupchanchia 4 Adamdighi 5 Nondigram 6 Shibganj	Bogura-1	360	0	0	100	140	200		0	0	7	98	3	90	25
2	Rajshahi	Bogura Bogura Bogura Bogura Bogura Bogura	1 Shajahanpur 2 Dhunot 3 Gabtoli 4 Sonatala 5 Sherpur 6 Shariakandi	Bogura-2	391	0	0	130	150	200	7	0	0	7	98	1	30	10
3	Rajshahi	Sirajganj Sirajganj Sirajganj Sirajganj Sirajganj Sirajganj	1 Ullapara (part) 2 Shahjadpur (Part) 3 Raigonj 4 Tarash (Part) 5 Belkuchi (Part) 6 Chauhali (Part)	Sirajganj-1	247	5	20	200	130	210	127	0	0	3	42	2	40	0
4	Rajshahi	Sirajganj Sirajganj Sirajganj Sirajganj Sirajganj Sirajganj	1 Kazipur 2 Sirajganj Sadar 3 Kamarkhand 4 Belkuchi (Part) 5 Chauhali (Part)	Sirajganj-2	333	0	0	200	90	110	31	0	1	3	70	2	60	10
5	Rajshahi	Naogaon Naogaon Naogaon Naogaon Naogaon Naogaon Naogaon Bogura	1 Atrai 2 Badalgachi 3 Mohadevpur (Part) 4 Manda 5 Naogaon Sadar 6 Niamatpur 7 Raninagar 8 Adamdighi (Part)	Naogaon-1	236	2	0	300	190	210		0	0	3	42	2	70	30

SL	Division	District	Upazila/ Thana/ City Corporation / Pourashava	Major Items/ Components															
				Name of PBS	33 kV and below voltage line (new /upgradation) (km)	33 kV Underground cable (km)	11 kV Underground Cable (km)	Insulated conductor(km)	LT to HT Conversion, (km)	HT 1 Ph to HT 3 Ph conversion (km)	Rehabilitation of line in flood prone area (km)	River crossing Tower (Set)	33/11 kV Sub-Station						
													New			Augmentation			
													No. (20 MVA)	No. (10 MVA)	Total (MVA)	No.	MVA	(Increased MVA)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14			15			
6	Rajshahi	Naogaon Naogaon Naogaon Naogaon Naogaon	1 Patnitala 2 Mohadevpur (Part) 3 Porsha (Part) 4 Sapahar 5 Dhamoirhat	Naogaon-2	220	0	0	150	70	90		0	0	3	42	0	0	0	
7	Rajshahi	Joypurhat Joypurhat Joypurhat Joypurhat Joypurhat	1 Joypurhat Sadar 2 Panchbibi 3 Kalai 4 Kheltai 5 Akkelpur	Joypurhat	207	2	6	140	110	160		0	0	2	28	2	40	0	
8	Rajshahi	Natore Natore Natore Natore Rajshahi Rajshahi	1 Natore Sadar 2 Naldanga 3 Bagatipara (Part) 4 Singra 5 Puthia 6 Bagmara	Natore-1	398	10	0	280	160	180		0	0	6	84	2	40	10	
9	Rajshahi	Natore Rajshahi Natore Natore Natore Kushtia Natore Rajshahi	1 Banpara 2 Charghat 3 Lalpur 4 Baraigram 5 Bagatipara (Part) Daulatpur (Part) 6 Gurudaspur 7 Bagha	Natore-2	414	0	0	160	160	200		0	0	5	70	2	60	25	
10	Rajshahi	Pabna Pabna Pabna Pabna Pabna Pabna Pabna Pabna	1 Atghoria (Part) 2 Chatmohar 3 Bhangura 4 Pabna Sadar (Part) 5 Ishurdi 6 Faridpur 7 Tarash (Part) 8 Ullapara (Part)	Pabna-1	257	0	5	220	140	190	69	0	0	4	56	2	40	10	

SL	Division	District	Upazila/ Thana/ City Corporation / Pourashava	Major Items/ Components															
				Name of PBS	33 kV and below voltage line (new /upgradation) (km)	33 kV Underground cable (km)	11 kV Underground Cable (km)	Insulated conductor(km)	LT to HT Conversion, (km)	HT 1 Ph to HT 3 Ph conversion (km)	Rehabilitation of line in flood prone area (km)	River crossing Tower (Set)	33/11 kV Sub-Station					
													New			Augmentation		
													No. (20 MVA)	No. (10 MVA)	Total (MVA)	No.	MVA	(Increased MVA)
1	2	3	4	5	6	7	8	9	10	11	12	13	14			15		
11	Rajshahi	Pabna Pabna Pabna Pabna Pabna Pabna Sirajganj Sirajganj	1 Bera 2 Santhia 3 Kumarkhali (part) 4 Pabna Sadar (Part) 5 Shahjadpur (Part) 6 Atghoria (Part) 7 Sujanagar	Pabna-2	273	15	15	200	130	160	11	0	0	4	56	1	20	0
12	Rajshahi	Rajshahi Rajshahi Rajshahi Rajshahi Rajshahi	1 Durgapur 2 Godagari 3 Mohonpur 4 Paba 5 Tanore	Rajshahi	221	0	0	160	140	170	2	0	0	3	42	2	40	10
13	Rajshahi	Chapainawabganj Chapainawabganj Chapainawabganj Chapainawabganj Chapainawabganj Naogaon	1 Chapainawabganj Sadar 2 Shibganj 3 Nachol 4 Gomostapur 5 Bholahat 6 Porsha (Part)	Chapainawabganj	455	0	0	200	120	100		1	0	3	42	2	40	0
	Sub-Total Rajshahi Division (13PBS)				4008	34	46	2440	1730	2180	247	1	1	53	770	23	570	130
14	Rangpur	Rangpur Gaibandha Gaibandha Rangpur Rangpur	1 Mithaoukur 2 Sundarganj (Part) 3 Sadullapur 4 Piragonj 5 Pirgacha	Rangpur-1	237	0	0	270	230	300	11	0	0	3	42	2	60	25

SL	Division	District	Upazila/ Thana/ City Corporation / Pourashava	Major Items/ Components														
				Name of PBS	33 kV and below voltage line (new /upgradation) (km)	33 kV Underground cable (km)	11 kV Underground Cable (km)	Insulated conductor(km)	LT to HT Conversion, (km)	HT 1 Ph to HT 3 Ph conversion (km)	Rehabilitation of line in flood prone area (km)	River crossing Tower (Set)	33/11 kV Sub-Station					
													New			Augmentation		
													No. (20 MVA)	No. (10 MVA)	Total (MVA)	No.	MVA	(Increased MVA)
1	2	3	4	5	6	7	8	9	10	11	12	13	14			15		
15	Rangpur	Nilphamari Rangpur Rangpur Rangpur Rangpur Rangpur	1 Syedpur 2 Rangpur Sadar 3 Taragonj 4 Kaunia 5 Gangachara 6 Badargonj	Rangpur-2	451	0	0	150	180	210		0	0	6	84	2	40	5
16	Rangpur	Dinajpur Dinajpur Dinajpur Dinajpur Dinajpur Dinajpur Dinajpur	1 Birol 2 Chirirbandar 3 Kaharol 4 Bochaganj 5 Birganj 6 Dinajpur Sadar 7 Khansama	Dinajpur-1	283	2	5	160	220	300		2	0	3	42	0	0	0
17	Rangpur	Dinajpur Dinajpur Dinajpur Dinajpur Dinajpur Dinajpur	1 Parbatipur 2 Fulbari 3 Birampur 4 Nawabganj 5 Hakimpur 6 Ghoraghat	Dinajpur-2	200	0	0	150	140	200		0	0	3	42	1	20	0

SL	Division	District	Upazila/ Thana/ City Corporation / Pourashava	Major Items/ Components															
				Name of PBS	33 kV and below voltage line (new /upgradation) (km)	33 kV Underground cable (km)	11 kV Underground Cable (km)	Insulated conductor(km)	LT to HT Conversion, (km)	HT 1 Ph to HT 3 Ph conversion (km)	Rehabilitation of line in flood prone area (km)	River crossing Tower (Set)	33/11 kV Sub-Station						
													New			Augmentation			
													No. (20 MVA)	No. (10 MVA)	Total (MVA)	No.	MVA	(Increased MVA)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14			15			
18	Rangpur	Thakurgaon Thakurgaon Thakurgaon Thakurgaon Thakurgaon Panchagarh Panchagarh Panchagarh Panchagarh Panchagarh	1 Thakurgaon Sadar 2 Baliadangi 3 Pirganj 4 Ranisankail 5 Haripur 6 Panchagarh 7 Atwari 8 Tetulia 9 Boda 10 Debiganj	Thakurgaon	479	0	0	300	320	470		1	0	5	70	0	0	0	
19	Rangpur	Nilphamari Nilphamari Nilphamari Nilphamari Nilphamari	1 Jaldhaka 2 Dimla 3 Domar 4 Kishoreganj 5 Nilphamari	Nilphamari	256	0	0	155	150	350		0	0	3	42	0	0	0	

SL	Division	District	Upazila/ Thana/ City Corporation / Pourashava	Major Items/ Components														
				Name of PBS	33 kV and below voltage line (new /upgradation) (km)	33 kV Underground cable (km)	11 kV Underground Cable (km)	Insulated conductor(km)	LT to HT Conversion, (km)	HT 1 Ph to HT 3 Ph conversion (km)	Rehabilitation of line in flood prone area (km)	River crossing Tower (Set)	33/11 kV Sub-Station					
													New			Augmentation		
													No. (20 MVA)	No. (10 MVA)	Total (MVA)	No.	MVA	(Increased MVA)
1	2	3	4	5	6	7	8	9	10	11	12	13	14			15		
20	Rangpur	Kurigram Kurigram Kurigram Lalmonirhat Kurigram Lalmonirhat Kurigram Kurigram Gaibandha Kurigram Lalmonirhat	1 Bhurungamari 2 Chilmari 3 Phulbari 4 Kaliganj 5 Kurigram sadar 6 Lalmonirhat Sadar 7 Nageshwari 8 Rajarhat 9 Sundarganj (Part) 10 Ulipur 11 Aditmari	Kurigram-Lalmonihat	327	5	9	600	240	350	9	0	0	5	70	2	40	15
21	Rangpur	Gaibandha Gaibandha Gaibandha Gaibandha Gaibandha	1 Gaibandha Sadr 2 Phulchari 3 Gobindaganj 4 Palashbari 5 Saghata	Gaibandha	227	7	0	575	140	200	47	2	0	2	28	2	40	20
Sub-Total Rangpur Division (8 PBS)					2457	14	14	2360	1620	2380	67	5	0	30	420	9	200	65
Grand Total Rajshahi & rangpur Div. (21 PBS)					6465	48	60	4800	3350	4560	314	6	1	83	1190	32	770	195

Table III-3: Status of land purchased of land

SL	Name of PBS	No. of proposed substation	Location of the proposed sub-stations	Status of Land Purchase		Types of Land
				Purchased completed	Land will be purchased	
1	Bogra-1	7	• Bogra-3 • Shibganj-4 • Kahalu-2 • Kahalu-3 • Adomdigi-2 • Dupchapia-2 • Nondigram-3	• Kahalu-2 (45 Decimal)	• Bogra-3 (44 Decimal) • Shibganj-4 (55 Decimal) • Kahalu-2 (45 Decimal) • Adomdighi-2 (60 Decimal) • Dupchapia-2 (50 Decimal) • Nondigram-3 (50 Decimal)	• Low Land • Ditch • Agricultural land • Agricultural land • Agricultural Land
Amount of Land				**45 Decimal**	**304 Decimal**	-
2	Bogra -2	7	• Shahjahanpur -2 • Gabtoli-3 • Dhunot-2 • Gabtoli-4 • Sherpur-4 • Dhunot-3	• Shahjahanpur-2 (43 Decimal) • Gabtoli-3 (44 Decimal) • Dhunot-2 (40 Decimal) • Gabtoli-4 (45 Decimal)	• Sherpur-4 (50 Decimal) • Dhunot-3 (45 Decimal	• Barren Land • Agricultural land • Barren Land
Amount of Land				**172 Decimal**	**95 Decimal**	-
3	Sirajgonj-1	3	Yet not decided	-	-	
Amount of Land				**-**	**-**	
4	Naogaon-1	3	• Bodolgachi-2 • Noagaon-4 • Manda-4 • Niyamotpur-4 • Asrai-4	-	• Bodogachi-2 (40 Decimal) • Noagaon-4 (40 Decimal) • Manda-4 (40 Decimal) • Niyamotpur-4(40 Decimal) • Atrai-4 (40 Decimal)	• Agricultural land • Agricultural land • Agricultural land • Agricultural land • Agricultural land
Amount of Land				**-**	**200 Decimal**	**-**
5	Rajshahi	3	Negotiation Ongoing	-	• Yet not selected (57.5 Decimal) • Yet not selected (57.5 Decimal)	• Agricultural Land • Agricultural Land
Amount of Land				**-**	**115 Decimal**	**-**
6	Gaibandha	2	• Gaibandha-2 • Gobindoganj-4	• Gaibandha-2 (33 Decimal) • Gobindoganj (40 Decimal)	-	• Low Land • Low Land
Amount of Land				**73 Decimal**	**-**	-
7	Thakurgaon	5	• Thakurgaon-5 • Thakurgaon-7 • Baliadanga-2 • Panchogar-2 • Autoari-2	-	• Thakurgaon-5 (40 Decimal) • Thakurgaon-7(40 Decimal) • Baliadanga-2(40 Decimal) • Panchogar-2(40 Decimal) • Autoari-2(40 Decimal)	• Agricultural land • Low Land • Barren Land • Low Land • Low Land
Amount of Land				**-**	**200 Decimal**	**-**
8	Natore -1	6	• Gurudashpur	• Gurudashpur (40 Decimal)	-	• Agricultural Land
Amount of Land				**40 Decimal**	**-**	-

*OFFICIAL USE ONLY

SL	Name of PBS	No. of proposed substation	Location of the proposed sub-stations	Status of Land Purchase		Types of Land
				Purchased completed	Land will be purchased	
9	Natore -2	5	• Shahibazar-1	• Shahibazar-1 (33 Decimal)	7	
Amount of Land				**33 Decimal**	**-**	**-**
10	Sirajganj -2	4	• Belkuchi-5 • Shirajganj-4 • Kajipur • Shirajganj-5	-	• Belkuchi-5 (40 Decimal) • Shirajganj-4 (40 Decimal) • Kajipur(40 Decimal) • Shirajganj-5(40 Decimal)	• Agricultural land • Agricultural land • Agricultural land • Agricultural land
Amount of Land				**-**	**200 Decimal**	
11	Nilphamari	3	• Kishorgeonh-2 • Dimla-2 • Joldhaka-2	-	• Kishorgeonh-2 (50 Decimal) • Dimla-2 (50 Decimal) • Joldhaka-2(50 Decimal)	• Low Land • Barren Land • Barren Land
Amount of Land				**-**	**150 Decimal**	
12	Joypurhat	2	Yet not decided	-	-	-
Amount of Land				**-**	**-**	
13	Pabna -1	4	• Chatmohor-3 • Vanguura-3 • Atghoria-3	• Chatmohor-3 (51 Decimal) • Vanguura-3 (50 Decimal) • Atghoria-3 (50 Decimal)	-	• Agricultural Land • Agricultural Land • Agricultural Land
Amount of Land				**150 Decimal**	-	-
14	Dinajpur- 1	3	Yet not decided	-	• 50 Decimal • 50 Decimal • 50 Decimal	• Low land • Low land • Low land
Amount of Land				-	**150 Decimal**	•
15	Rangpur -1	3	• Mithapukur-5 • Sadullapur-2 • Pirgacha-3 (Chahola)	• Mithapukur-5 (48 Decimal)	• Sadullapur-2 (48 Decimal) • Pirgacha-3 (48 Decimal)	• Barren Land • Barren Land • Barren Land
Amount of Land				**48 Decimal**	**96 Decimal**	•
16	Pabna-2	4	Negotiation Completed	• 50 Decimal • 50 Decimal • 50 Decimal • 50 Decimal • 50 Decimal	-	• Agricultural Land/Ditch
Amount of Land				**200 Decimal**	----	•
17	Dinajpur -2	3	• Bikrampur- 2 • Fulbari -2 • Parbatipur - 2	-	• Bikrampur- 2 (50 Decimal) • Fulbari -2 (50 Decimal) • Parbatipur - 2 (50 Decimal)	• Agricultural Land • Agricultural Land • Agricultural Land
Amount of Land					**150 Decimal**	•
18	Rangpur-2	6	-	-	-	-
Amount of Land				-	-	
19	Naogaon-2	3	-	-	-	-
Amount of Land				-	-	
20	Chapainababganj	3	-	-	-	-
Amount of Land				-	-	
21	Kurigram-lalmonihat	5	• Fulbari-1 • Lalmonirhat-1 • Aditmari- 2 • Kurigram -2 • Rajarhat-2	• Fulbari-1 (40 Decimal) • Lalmonirhat-1 (45 Decimal) • Aditmari- 2 (40 Decimal)	-	-

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SL	Name of PBS	No. of proposed substation	Location of the proposed sub-stations	Status of Land Purchase		Types of Land
				Purchased completed	Land will be purchased	
				• Kurigram -2 (40 Decimal) • Rajarhat-2 (45 Decimal		
Amount of Land				**210 Decimal**	-	
Grand Total		**84**		**971 Decimal**	**1660 Decimal**	

E. PROJECT LOCATION

94. The project, consisting of twenty-One (21) PBSs, is located in Rajshahi-Rangpur Division. Bangladesh e.g., Dinajpur PBS 1, Dinajpur PBS 2, Joypurhat PBS, Thakurgaon PBS, Rangpur PBS 1, Rangpur PBS 2, Nilphamari PBS, Kurigram-Lalmonirhut PBS, Gaibandha PBS, Naogaon PBS 1, Naogaon PBS 2, Rajshahi PBS, Chapainawabganj PBS, Bogura PBS 1, Bogura PBS 2, Sirajganj PBS 1, Sirajganj PBS 2, Natore PBS 1, Natore PBS 2, Pabna PBS 1, Pabna PBS 2.

95. The aforesaid 21 PBSs have their individual registered office in their own land in respective geographical location with provision of all required utilities like electricity, water, gas etc. for their own use. Besides, it is also to be mentioned that no such utility line in the PBS area needs to be shifted or relocated elsewhere during the project execution. There is no major disaster risk of potential nature except regular monsoon weather as prevail in Bangladesh.

96. The proposed sites for substations are vacant at present and require development for power, water, access roads and drainage. The project site must be raised to the level of 2 ft. (above highest flood level) as preventing flood-related damage to substations also reduces the environmental impact associated with disposing of damaged equipment and the release of hazardous substances into floodwaters. Elevating substations is part of building a more resilient electrical grid. Resilience ensures that the grid can withstand and recover from disruptions, including natural disasters, more effectively. Raising the substation above flood levels is a proactive measure to mitigate the risk associated with extreme weather events, such as hurricanes, heavy rainfall, or storm surges. It reduces the likelihood of damage and minimizes the need for emergency repairs. There will be no major impacts & risks raising the site level on the surroundings areas as the required land for substation is very small and there will be no possibility of inundation, crop damage and access to common properties.

97. The proposed project site is surrounded by a mix of agricultural land, barren land, ditches, and small habitations. For the new proposed substations, maximum lands have been purchased by PBS till June 2024 and rest of the lands for the proposed substations will be purchased very soon in prior to the construction stage. All of the land has been purchased through “willing buyer willing seller” approaches and rest of the land will be purchased through the same approach. A total of six (06) river crossing towers will be constructed, having very minimal impact over the surrounding environment. This is because all of the river crossing towers will be constructed far away from the riverbank, and there are no possibilities for flood and erosion. Some figures for the present situations of purchased lands (substations) locations are given below:

Shajahanpur-2 (Khottapara), Bogra PBS-2

Kaunia-3 (Mirbag), Rangpur PBS-2

Pirganj-2 (Jabarhat), Thakurgaon PBS

Birol-2 (Ranipukur), Dinajpur PBS-1

Pirgacha-3 (Pawtana), Rangpur PBS

Chatmohar-3 (Pachuria), Pabna PBS-1

Figure III.1: Present Situations of the Purchased lands (Substations

98. As per the Land Audit interim phase, 30 substations (out of 116 SS) of Rajshahi and Rangpur Divisions have been audited in which 22 are newly land purchased proposed SS, 1 is proposed new substation in donated land, and 7 are old substations. In these two divisions, there are 84 proposed new substations which will be constructed in purchased land and 32 old substations will be augmented and renovated. All the construction and operation activities of these substations will be initiated under 21 PBSs in this region. Substations name with criteria is given in the following table:

Table III-4: List of audited PBSs substations

SL	Name of Substations (SS)	Name of PBS	Proposed substation (new)	Proposed for renovation (old)
1	Bholahat-2	Chapainawabgonj	√	

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SL	Name of Substations (SS)	Name of PBS	Proposed substation (new)	Proposed for renovation (old)
2	Bochaganj	Dinajpur-1	√	
3	Pabna Sadar-3	Pabna-1	√	
4	Gabtoli-4	Bagura-2	√	
5	Tanore-4	Rajshahi	√	
6	Dhunat-2	Bagura-2	√	
7	Atghoria-3	Pabna-1	√	
8	Mithapukur-5	Rangpur-1	√	
9	Chatmohar-3	pabna-1	√	
10	Gabtoli-3	Bagura-2	√	
11	Gomastapur-1	Chapai Nawabgonj		√
12	Rajshahi PABA-3	Rajshahi	Donation	
13	Shibganj-2	Chapai Nawabgonj		√
14	Dinajpur – 2	Dinajpur-2		√
15	Badarganj -1	Rangpur-2		√
16	Paglapir	Rangpur-2		√
17	Godagari-1	Rajshahi		√
18	Bhangura-3	Pabna-1	√	
19	Gurudaspur-3	Natore-2	√	
20	Shajahanpur-2	Bagura-2	√	
21	Kahaloo-2	Bagura-1	√	
22	Singra-4	Natore-1	√	
23	Natore-4	Natore-1	√	
24	Baghmara-5	Natore-1	√	
25	Puthia-3	Natore-1	√	
26	Kishoreganj-2	Nilphamari	√	
27	Durgapur -1	Rajshahi		√
28	Pirgacha-3	Rangpur-1	√	
29	Baghmara -4	Natore-1	√	
30	Charghat -3	Natore-2		
Sub-Total			**23**	**7**

Table III-5: Status of new purchased SS according to the land audit

Name of Substations	PBS Name	District	Upazila	Land size	Status of land transfer process	Number of negotiation meeting	Status of Registration
1.Shajahanpur-2	Bagura-2	Bogura	Shajahanpur	43	Purchased	2	Yes
2.Gabtoli-4	Bagura-2	Bogura	Gabtoli	45	Purchased	2	Yes
3.Gabtoli-3	Bagura-2	Bogura	Gabtoli	44	Purchased	2	Yes
4.Dhunat-2	Bagura-2	Bogura	Dhunat	40	Purchased	2	Yes

Name of Substations	PBS Name	District	Upazila	Land size	Status of land transfer process	Number of negotiation meeting	Status of Registration
5. Kahaloo-2	Bagura-1	Bogura	Kahaloo	45	Purchased	1	Yes
6.Puthia-3	Natore-1	Rajshahi	Puthia	55	Purchased	3	Yes
7.Bagmara-5	Natore-1	Rajshahi	Bagmara	50	Purchased	3	Yes
8.Paba-3	Rajshahi	Rajshahi	Paba	33	Donation[4]	N/A	No
9. Tanore-4	Rajshahi	Rajshahi	Tanore	57.55	Purchased	2	Yes
10. Bholahat-2	Chapainawabgonj	Chapai Nawabganj	Bholahat	44	Purchased	2	Yes
11.Bochaganj	Dinajpur-1	Dinajpur	Bochaganj	45	Purchased	3	Yes
12. Mithapukur-5	Rangpur-1	Rangpur	Mithapukur	38	Purchased	2	Yes
13. Pirgacha-3	Rangpur-1	Rangpur	Pirgacha	54	Purchased	2	Yes
14. Kishorgonj-2	Nilphamari	Nilphamari	Kishorgonj	50	Purchased	2	Yes
15.Bagmara-4	Natore-1	Rajshahi	Bagmara	40	Under process*[5]	3	No
16.Atghoria-3	Pabna-1	Pabna	Atghoria	50	Purchased	2	Yes
17. Bhangura-3	Pabna-1	Pabna	Bhangura	50	Purchased	2	Yes
18. Singra-4	Natore-1	Natore	Singra	39.17	Purchased	3	Yes
19.Chatmohor-3	Pabna-1	Pabna	Chatmohor	51	Purchased	2	Yes
20.Gurudaspur-3	Natore-2	Natore	Gurudaspur	40	Purchased	3	Yes
21.Pabna Sadar-3	Pabna-1	Pabna	Pabna Sadar	50	Purchased	2	Yes
22.Charghat-3	Natore-2	Rajshahi	Charghat	41.8	Purchased	3	Yes
23. Natore-4	Natore-1	Natore	Natore Sadar	40	Purchased	3	Yes

Table III-6: Status of old substations will be augmented as per land audit

Name of Substations	District	Upazila	Union	Means for land transfer	Land Size (decimal)	Current Status of the land
Rangpur-2, Paglapir	Rangpur	Rangpur Sadar	Horidebpur	Acquired	33	Operation
Rangpur-2, Badarganj-1	Rangpur	Badarganj	Modhupur	Acquired	64	Operation
Dinajpur-2	Dinajpur	Birampur	Pourosova	Acquired	43	Operation
Godagari-1	Rajshahi	Godagari	Godagari	Acquired	33	Operation
Durgapur-1	Rasjshahi	Durgapur	Durgapur Puroshova	Acquired	33	Operation
Shibganj-2	Chapai Nawabganj	Shibganj	Shahbazpur	Acquired	33	Operation
Gomostapur-1	Chapai Nawabganj	Gomostapur	Parbotipur	Acquired	NA	Operation

[4] Transfer is under process
[5] Negotiation completed but payment is in process

Figure III.2: Project Location Map

F. TECHNOLOGY FEATURES

99. In this project, BREB mainly constructs three (03) major items.

a) Substation (new & upgradation)
b) Distribution line (new/ upgradation/ conversion)
c) River crossing tower

100. The power distribution system of the country is based on power generation and transmission through the national grid, which eventually is fed into substations capable of converting 33 kV supply into 11 kV and feeding the distribution system with the same.

1. New Substations

101. Under the project, there are 84 new 33/11 kV substations to be installed by 2028with modern equipment and technology. Most of the new substations will be of indoor type, which typically requires about 0.40-0.50 acres of land. A typical 33/11 kV substation involves installation of 10/14 or 20/28 MVA transformers, installation of 33 kV bays, a control room, and installation of associated 33/11 kV feeders.

102. Once the selection and purchase of land for the substation are done, subsoil investigations have to be carried out to assess the suitability of the soil for construction of the Substation and other infrastructure. The civil construction works include the construction of the control room (building) along with the construction of the foundations for different equipment, followed by the construction of the boundary wall and the guard room. Detail list of the proposed substation is given below:

Table III-7: Details Technical information of proposed substation

PBS_Name	ALP_Code	SE_Zone	Sourc_Grid	Grid_Cap	NoF_GTX	SS_Name	SS_Cap	SS_Type	Owner	Status	Longitude	Latitude	Address
Bogra PBS-1	BG R-1	Bogra Zone	Dupchachia Grid (Proposed)	160/240	2x80/120	Dupchanchia-2	10	Indoor	PBS	Proposed	89.12435	24.91842	Jaroi, Zianagor, Dupchachia, Bogra
Bogra PBS-1	BG R-1	Bogra Zone	Dupchachia Grid (Proposed)	160/240	2x80/120	Kahalu-3	10	Indoor	PBS	Proposed	89.25320	24.86330	Narhat, Narhat, Kahalu, Bogra
Bogra PBS-1	BG R-1	Bogra Zone	Dupchachia Grid (Proposed)	160/240	2x80/120	Adomdighi-2	10	Indoor	PBS	Proposed	89.13450	24.75938	Jhakhoir, Chapapur, Adomdighi, Bogra
Joypurhat PBS	JOY	Bogra Zone	Joypurhat	100/164	4x25/41	Joypurhat-4	10	Indoor	PBS	Proposed	89.02385	25.14114	Puranapoil, Joypurhat Sadar, Joypurhat
Joypurhat PBS	JOY	Bogra Zone	Joypurhat	100/164	4x25/41	Panchbibi-3	10	Indoor	PBS	Proposed	89.01122	25.20971	Nouda, Balighata, Panchbibi, Joypurhat
Naogaon PBS-2	NGO-2	Bogra Zone	Joypurhat	100/164	2x25/41, 2x15/20	Patnitala-4 (Agradigun)	10	Indoor	PBS	Proposed	88.80357	25.09038	Pati Amlai, Patichora, Patnitola, Naogaon

PBS_Name	ALP_Code	SE_Zone	Sourc_Grid	Grid_Cap	NoF_GTX	SS_Name	SS_Cap	SS_Type	Owner	Status	Longitude	Latitude	Address
Naogaon PBS-2	NGO-2	Bogra Zone	Joypurhat	100/164	4x25/41	Dhamurhat-3	10	Indoor	PBS	Proposed	88.70395	25.16988	Kashipur, Agridigun, Dhamirhat, Naogaon
Bogra PBS-1	BGR-1	Bogra Zone	Mohasthangarh Grid	160/240	2x80/120	Bogra-3	10	Indoor	PBS	Proposed	89.37749	24.90920	Banomalipara, Shakharia, Bagra Sadar, Bogra
Bogra PBS-1	BGR-1	Bogra Zone	Mohasthangarh Grid	160/240	2x80/120	Shibganj-4	10	Indoor	PBS	Proposed	89.37493	25.05770	Rahbol, Deuli, Shibganj, Bogra
Bogra PBS-1	BGR-1	Bogra Zone	Mohasthangarh Grid	160/240	2x80/120	Kahalu-2	10	Indoor	PBS	Proposed	89.22700	24.79300	Sabanpur, Durgapur, Kahalu, Bogra
Naogaon PBS-1	NGO-1	Bogra Zone	Naogaon Grid	150/225	3x50/75	Badolgachi-2	10	Indoor	PBS	Proposed	88.96875	24.96875	Jagotnagor, Mithapur, Badolgachi, Naogaon
Naogaon PBS-1	NGO-1	Bogra Zone	Naogaon Grid	150/225	3x50/75	Atrai-4	10	Indoor	PBS	Proposed	88.87326	24.68792	Muskipur, Monihari, Atrai, Naogaon

PBS_Name	ALP_Code	SE_Zone	Sourc_Grid	Grid_Cap	NoF_GTX	SS_Name	SS_Cap	SS_Type	Owner	Status	Longitude	Latitude	Address
Naogaon PBS-2	NGO-2	Bogra Zone	Niamatpur	120/182	2x35/50, 2x25/41	Porsha-2	10	Indoor	PBS	Proposed	88.56960	24.98011	Somnagor, Ghatnagor, Porsha, Naogaon
Naogaon PBS-1	NGO-1	Bogra Zone	Niamatpur	120/182	2x35/50, 2x25/41	Niamotpur-4	10	Indoor	PBS	Proposed	88.56174	24.73929	Jarullapur, Bahadurpur, Niamotpur, Naogaon
Sirajganj PBS-2	SRJ-2	Bogra Zone	Saydabad Grid			Belkuchi-5(Shomespur)	10	Indoor	PBS	Proposed	89.75712	24.37147	Sirajganj Economic Zone
Sirajganj PBS-1	SRJ-1	Bogra Zone	Shahjadpur	170/250 MVA	2x35/50, 2x50/75	Ullapara-9 (Salap)	10	Indoor	PBS	Proposed	89.48401	24.27285	Salop, Ullapara, Sirajganj
Sirajganj PBS-1	SRJ-1	Bogra Zone	Sherpur (Bogra)	100/150 MVA	2x50/75	Tarash-3 (Gulta)	10	Indoor	PBS	Proposed	89.35696	24.50856	Talom, Tarash, Sirajgonj
Sirajganj PBS-1	SRJ-1	Bogra Zone	Sherpur (Bogra)	100/150 MVA	2x50/75	Raygonj-4	10	Indoor	PBS	Proposed	89.43406	24.51962	Dhamainagor, Raigonj, Sirajgonj .

PBS_Name	ALP_Code	SE_Zone	Sourc_Grid	Grid_Cap	NoF_GTX	SS_Name	SS_Cap	SS_Type	Owner	Status	Longitude	Latitude	Address
Bogra PBS-1	BG R-1	Bogra Zone	Sherpur (Bogra)	2x50/75	2x50/75	Nandigram-3	10	Indoor	PBS	Proposed	89.24132	24.61395	Bijoyghat, Nandigram, Bogra
Sirajganj PBS-2	SRJ -2	Bogra Zone	Sirajganj	160/241	1x50/75	Sirajgonj-5 (BSCIC-2)	10	Indoor	PBS	Proposed	89.74043	24.35942	Sirajganj Economic Zone
Sirajganj PBS-2	SRJ -2	Bogra Zone	Sirajganj	160/241	1x50/75	Sirajgonj-6 (Economic Zone)	10	Indoor	PBS	Proposed	89.74779	24.36942	Sirajganj Economic Zone
Sirajganj PBS-2	SRJ -2	Bogra Zone	Ullapara Grid	160/240		Belkuchi-4	10	Indoor	PBS	Proposed	89.69909	24.31960	Subornosara, Belkuchi, Sirajganj
Bogura PBS-2	BG R-2	Bogura Zone	Bogura	290/435	1x50/75, 3x80/120	Gabtoli-3	10	Indoor	PBS	Proposed	89.51727	24.81249	Baliadighi,Gabtoli,Bogura
Bogura PBS-2	BG R-2	Bogura Zone	Bogura	290/435	1x50/75, 3x80/120	Shajahanpur-2	10	Indoor	PBS	Proposed	89.40481	24.78733	Khottapara, Shajahanpur, Bogura

PBS_Name	ALP_Code	SE_Zone	Sourc_Grid	Grid_Cap	NoF_GTX	SS_Name	SS_Cap	SS_Type	Owner	Status	Longitude	Latitude	Address
Bogura PBS-2	BG R-2	Bogura Zone	Bogura	290/435	1x50/75, 3x80/120	BEZA	20	Indoor	PBS	Proposed	89.35120	24.78776	Ashekpur, Shajahanpur, Bogura
Bogura PBS-2	BG R-2	Bogura Zone	Mohasthangarh	160/240	2x80/120	Gabtoli-4	10	Indoor	PBS	Proposed	89.41619	24.99064	Golabari, Gabtoli, Bogura
Bogura PBS-2	BG R-2	Bogura Zone	Sherpur	100/150	2x50/75	Dhunat-2	10	Indoor	PBS	Proposed	89.54368	24.60539	Mathurapur, Dhunat, Bogura
Bogura PBS-2	BG R-2	Bogura Zone	Sherpur	100/150	2x50/75	Sherpur-4	10	Indoor	PBS	Proposed	89.38844	24.58361	Bishalpur, Sherpur, Bogura
Bogura PBS-2	BG R-2	Bogura Zone	Sherpur	100/150	2x50/75	Dhunat-3	10	Indoor	PBS	Proposed	89.56455	24.73751	Gosaibari, Dhunat, Bogura
Chapai Nawabganj PBS	NWB	Rajshahi Zone	Amnura Grid	105/150	3×35/50	Shibgonj-5 (Binodpur)	10	Indoor	PBS	Proposed	88.11491	24.74135	Khaserhat,Shibgonj,Chapainawabgonj

PBS_Name	ALP_Code	SE_Zone	Sourc_Grid	Grid_Cap	NoF_GTX	SS_Name	SS_Cap	SS_Type	Owner	Status	Longitude	Latitude	Address
Pabna PBS-1	PA1	Rajshahi Zone	Bhangura Grid	100/150	2x50/75	Chatmohor-3	10	Indoor	PBS	Proposed	89.26240	24.15766	Pachuria,Chatmohor, Pabna.
Pabna PBS-1	PA1	Rajshahi Zone	Bhangura Grid	100/150	2x50/75	Bhangura-3	10	Indoor	PBS	Proposed	89.45221	24.24503	Paramandopur, Bhangura, Pabna
Chapai Nawabganj PBS	NWB	Rajshahi Zone	Chapai Nawabganj Grid	140/211	1×15/20 ,1×25/41,2×50/75	Shibganj-4 (Ranihati)	10	Indoor	PBS	Proposed	88.21252	24.58132	Ranihati,Nawabgonj, Chapainawabgonj
Natore PBS-2	NT-2	Rajshahi Zone	Iswardi	100/150	2x50/75	Lalpur-2	10	Indoor	PBS	Proposed	88.90547	24.19465	Paikpara, Durduria, Lalpur, Natore
Natore PBS-2	NT-2	Rajshahi Zone	Iswardi	100/150	2x50/75	Lalpur-3	10	Indoor	PBS	Proposed	89.07994	24.17892	Sundorbaria, Durduria, Lalpur, Natore
Natore PBS-1	NT-1	Rajshahi Zone	Natore	165/240	2x50/75 , 1x35/50 , 2x15/20	Bagmara-5	10	Indoor	PBS	Proposed	88.87810	24.60392	Vanshipara, Jhikra, Bagmara, Rajshahi

PBS_Name	ALP_Code	SE_Zone	Sourc_Grid	Grid_Cap	NoF_GTX	SS_Name	SS_Cap	SS_Type	Owner	Status	Longitude	Latitude	Address
Natore PBS-1	NT-1	Rajshahi Zone	Natore	165/240	2x50/75, 1x35/50, 2x15/20	Singra-4	10	Indoor	PBS	Proposed	89.26080	24.56070	Ratal, Sukash, Singra, Natore
Natore PBS-1	NT-1	Rajshahi Zone	Natore	165/240	2x50/75, 1x35/50, 2x15/20	Natore-4	10	Indoor	PBS	Proposed	88.89376	24.36997	Dostanabad, Kafuria, Natore Sadar, Natore
Natore PBS-1	NT-1	Rajshahi Zone	Natore	165/240	2x50/75, 1x35/50, 2x15/20	Natore-5	10	Indoor	PBS	Proposed	88.99919	24.46682	Thakur Laskhikole, Piprul, Noldanga, Natore
Natore PBS-2	NT-2	Rajshahi Zone	Natore	115/172	2x25/41, 2x15/20, 1x35/50	Gurudaspur-3	10	Indoor	PBS	Proposed	89.10487	24.34431	Alipur,Chapila,Gurudashpur, Natore
Natore PBS-2	NT-2	Rajshahi Zone	Natore	115/172	2x25/41, 2x15/20, 1x35/50	Baraigram-4	10	Indoor	PBS	Proposed	89.21221	24.26297	Chargobindopur, Jonail, Boroigram, Natore
Rajshahi PBS	RAJ	Rajshahi Zone	Niamotpur	120/182	2x35/50, 2x25/41	Tanore-4	10	Indoor	PBS	Proposed	88.54841	24.68277	Dorganga, Kolma, Tanore, Rajshahi

PBS_Name	ALP_Code	SE_Zone	Sourc_Grid	Grid_Cap	NoF_GTX	SS_Name	SS_Cap	SS_Type	Owner	Status	Longitude	Latitude	Address
Chapai Nawabganj PBS	NWB	Rajshahi Zone	Niamotpur Grid	120/182	2×25/41,2×35/50	Bholahat-2 (Haspukur)	10	Indoor	PBS	Proposed	88.21783	24.92778	Haspukur,Bhalahat,Chapainawabgonj
Pabna PBS-1	PA1	Rajshahi Zone	Pabna	150/232	2x50/75, 2x25/41,	Atghoria-3	10	Indoor	PBS	Proposed	89.18558	24.13571	Majhpara,Atghoria,Pabna.
Pabna PBS-1	PA1	Rajshahi Zone	Pabna	150/232	2x50/75, 2x25/41,	Pabna Sadar-3	10	Indoor	PBS	Proposed	89.17487	23.98870	Chorbhangabaria, Pabna
Pabna PBS-2	PA-2	Rajshahi Zone	Pabna	100/150	2x50/75, 2x25/41	Pabna-3 (Varara/Sadullapur)	20	Indoor	PBS	Proposed	89.35226	23.97239	Dublia, Sadullahpur, Pabna Sadar, Pabna
Rajshahi PBS	RAJ	Rajshahi Zone	Rajshahi (Katakhali)	195/290	2x80/120, 1x35/50	Mohonpur-2	10	Indoor	PBS	Proposed	88.62923	24.59362	Gocha, Raighati, Mohonpur, Rajshahi
Rajshahi PBS	RAJ	Rajshahi Zone	Rajshahi (Katakhali)	195/290	2x80/120, 1x35/50	Durgapur-3	10	Indoor	PBS	Proposed	88.80032	24.48978	Alipur, Noupara, Durgapur,, Rajshahi

PBS_Name	ALP_Code	SE_Zone	Sourc_Grid	Grid_Cap	NoF_GTX	SS_Name	SS_Cap	SS_Type	Owner	Status	Longitude	Latitude	Address
Natore PBS-1	NT-1	Rajshahi Zone	Rajshahi (Katakhali)	195/290	2x80/120, 35/50x1	Puthia-3	10	Indoor	PBS	Proposed	88.87404	24.46611	Jagopara, Shilmaria, Puthia, Rajshahi
Natore PBS-1	NT-1	Rajshahi Zone	Rajshahi (Katakhali)	195/290	2x80/120, 35/50x1	Bagmara-4	10	Indoor	PBS	Proposed	88.75422	24.54150	Jashopara, Ganipur, Bagmara, Rajshahi
Natore PBS-2	NT-2	Rajshahi Zone	Rajshahi (Katakhali)	195/290	2x80/120, 1x35/50	Charghat-3	10	Indoor	PBS	Proposed	88.74384	24.33378	Holidagachi,Sholua, Charghat, Rajshahi
Pabna PBS-2	PA-2	Rajshahi Zone	Sahajadpur	170/250	2x50/75, 2x35/50	Bera-3 (Kaitala)	20	Indoor	PBS	Proposed	89.64917	24.06802	Paikhando, Bera Paurashava, Bera, Pabna
Pabna PBS-2	PA-2	Rajshahi Zone	Sahajadpur	170/250	2x50/75, 2x35/50	Pabna-4 (Pushpapara)	20	Indoor	PBS	Proposed	89.35160	24.05394	Dharmogram, Ataikul, Pabna Sadar, Pabna
Pabna PBS-2	PA-2	Rajshahi Zone	Sahajadpur	170/250	2x50/75, 2x35/50	Santhia-3 (Dulauri)	20	Indoor	PBS	Proposed	89.46119	24.10567	Nurdaho, Dhulauri, Sathia, Pabna

PBS_Name	ALP_Code	SE_Zone	Sourc_Grid	Grid_Cap	NoF_GTX	SS_Name	SS_Cap	SS_Type	Owner	Status	Longitude	Latitude	Address
Dinajpur PBS-2	DJ-2	Rangpur Zone	Barapukuria Grid	125/191	2x50/75, 1x25/41	Nawabganj-3	10	Indoor	PBS	Proposed	89.10801	25.33084	Bajitpur, Bhaduria, Nobabganj, Dinajpur
Dinajpur PBS-2	DJ-2	Rangpur Zone	Barapukuria Grid	125/191	2x50/75, 1x25/41	Birampur-3	10	Indoor	PBS	Proposed	88.92404	25.37383	Saghata, Jotbani, Birampur, Dinajpur
Rangpur PBS-2	RN-2	Rangpur Zone	Jaldhaka	100/150	2x50/75	Gongachara-2	10	Indoor	PBS	Proposed	89.17683	25.88046	Moniram, Barobil, Gongachora, Rangpur
Rangpur PBS-2	RN-2	Rangpur Zone	Jaldhaka	100/150	2x50/75	Gongachara-3	10	Indoor	PBS	Proposed	89.25907	25.88616	Char Ichli, Laskmipur, Goggachora, Rangpur
Nilphamari PBS	NPH	Rangpur Zone	Jaldhaka	100/150	2x50/75	Jaldhaka-2	10	Indoor	PBS	Proposed	88.92895	26.06366	Rashidpur, Dharmopal, Jaldhaka, Nilphamari
Nilphamari PBS	NPH	Rangpur Zone	Jaldhaka	100/150	2x50/75	Dimla-2	10	Indoor	PBS	Proposed	89.02226	26.13590	Dalia, Khalisha Chapni, Dimla, Nilphamari

PBS_Name	ALP_Code	SE_Zone	Sourc_Grid	Grid_Cap	NoF_GTX	SS_Name	SS_Cap	SS_Type	Owner	Status	Longitude	Latitude	Address
Kurigram-Lalmonirhat	KRL	Rangpur Zone	Kurigram	100/150	2x50/75	Kurigram-3	10	Indoor	PBS	Proposed	89.54240	25.86251	Mirerbari, Chinai, Rajarhat, Kurigram
Kurigram-Lalmonirhat	KRL	Rangpur Zone	Kurigram	100/150	2x50/75	Rajarhat-2	10	Indoor	PBS	Proposed	89.55120	25.75760	Rothiramkamoljhau, Rajarhat, Kurigram
Kurigram-Lalmonirhat	KRL	Rangpur Zone	Kurigram	100/150	2x50/75	Ulipur-3	10	Indoor	PBS	Proposed	89.66500	25.66140	Dhamsreni, Modhupur, Ulipur, Kurigram
Kurigram-Lalmonirhat	KRL	Rangpur Zone	Kurigram	100/150	2x50/75	Fulbari-2	10	Indoor	PBS	Proposed	89.61266	25.92799	Rabaitari, Fulbari, Kurigram
Kurigram-Lalmonirhat	KRL	Rangpur Zone	Lalmonirhat	125/183	2x50/75, 1x25/33	Adithmari-3	10	Indoor	PBS	Proposed	89.31347	25.93365	Modonpur, Namuri, Aditmari, Lalmonirhat
Rangpur PBS-1	RN-1	Rangpur Zone	Mithapukur	100/150	2x50/75	Mithapukur-5	10	Indoor	PBS	Proposed	89.15495	25.52694	Polipara, Masimpur, 10 No Balua Masimpur, Mithapukur, Rangpur

PBS_Name	ALP_Code	SE_Zone	Sourc_Grid	Grid_Cap	NoF_GTX	SS_Name	SS_Cap	SS_Type	Owner	Status	Longitude	Latitude	Address
Rangpur PBS-1	RN-1	Rangpur Zone	Palasbari	150/232	2x25/41, 2x50/75	Sadullapur-2	10	Indoor	PBS	Proposed	89.23633	25.20267	Jugibari, Idilpur, Sadullahpur, Gaibandha
Dinajpur PBS-2	DJ-2	Rangpur Zone	Palasbari	150/232	2x25/41, 2x50/75	Dugdugihat (Ghoraghat)-2	10	Indoor	PDB	Proposed	89.14187	25.16832	Abirer Para, 3 No Singra, Ghoraghat, Dinajpur
Gaibandha PBS	GBD	Rangpur Zone	Palasbari	150/232	2x50/75, 2x25/41	Palashbari-2	10	Indoor	PBS	Proposed	89.27390	25.15120	Ghurabandha,Monoharpur,Palashbari
Gaibandha PBS	GBD	Rangpur Zone	Palasbari	150/232	2x50/75, 2x25/41	Saghata-2	10	Indoor	PBS	Proposed	89.31420	25.05150	Koichora, Kamalerpara, Saghata, Gaibandha
Thakurgaon PBS	THK	Rangpur Zone	Panchagar	50/82	2x25/41	Panchagar-2	10	Indoor	PBS	Proposed	88.66195	26.33899	Boguladangi, Chakla, Panchaghar
Thakurgaon PBS	THK	Rangpur Zone	Panchagar	50/82	2x25/41	Atwari-2	10	Indoor	PBS	Proposed	88.45358	26.31181	Jugikata, Dhamore, Taeari Sadar, Panchaghar

PBS_Name	ALP_Code	SE_Zone	Sourc_Grid	Grid_Cap	NoF_GTX	SS_Name	SS_Cap	SS_Type	Owner	Status	Longitude	Latitude	Address
Dinajpur PBS-1	DJ-1	Rangpur Zone	Purbo Sadipur	125/191		Bochaganj (Bokultola)	10	Indoor	PBS	Proposed	88.49850	25.86284	Jinor, Muraripur, Bochaganj, Dinajpur
Dinajpur PBS-1	DJ-1	Rangpur Zone	Purbo Sadipur	125/191		Dinajpur Sadar-4 (Kaugaon)	10	Indoor	PBS	Proposed	88.76693	25.53927	Sree Krisnopur Khamar, Chirirbandor, Dinajpur
Dinajpur PBS-1	DJ-1	Rangpur Zone	Purbo Sadipur	125/191		Chirirbandor-3 (Amtali)	10	Indoor	PBS	Proposed	88.72928	25.57592	Uthrail, Dinajpur Sadar, Dinajpur
Rangpur PBS-1	RN-1	Rangpur Zone	Rangpur	185/281	2x80/120, 1x25/41	Pirgacha-3	10	Indoor	PBS	Proposed	89.44946	25.68959	Poschim Brahmonikunda, Annodanagor, Rangpur
Rangpur PBS-2	RN-2	Rangpur Zone	Rangpur	185/281	2x80/120, 1x25/41	Rangpur-6	10	Indoor	PBS	Proposed	89.29583	25.68457	Azizullah, Tampat, Rangpur Sadar, Rangpur
Rangpur PBS-2	RN-2	Rangpur Zone	Rangpur	185/281	2x80/120, 1x25/41	Rangpur-7	10	Indoor	PBS	Proposed	89.16252	25.69132	Keshobpur, Soddopuskurini, Rangpur Sadar, Rangpur

PBS_Name	ALP_Code	SE_Zone	Sourc_Grid	Grid_Cap	NoF_GTX	SS_Name	SS_Cap	SS_Type	Owner	Status	Longitude	Latitude	Address
Rangpur PBS-2	RN-2	Rangpur Zone	Rangpur	185/281	2x80/120, 1x25/41	Rangpur-8	10	Indoor	PBS	Proposed	89.27717	25.77657	Fulamer Tol, Ward No-08, Rangpur City Corporation, Rangpur
Rangpur PBS-2	RN-2	Rangpur Zone	Saidpur	135/207	2x50/75	Badargonj-3	10	Indoor	PBS	Proposed	88.97469	25.72775	Moagach, Gopinathpur, Badorganj, Rangpur
Nilphamari PBS	NPH	Rangpur Zone	Saidpur	135/207	2x50/75	Kishorgonj-2	10	Indoor	PBS	Proposed	89.05019	25.85733	North Singra, Magura, Kishoreganj, Nilphamari
Thakurgaon PBS	THK	Rangpur Zone	Thakurgaon	50/82	2x25/41	Thakurgaon-5	10	Indoor	PBS	Proposed	88.39846	25.97810	Rampur, Jamalpur, Thakurgaon Sadar, Thakurgaon
Thakurgaon PBS	THK	Rangpur Zone	Thakurgaon	50/82	2x25/41	Thakurgaon-6	10	Indoor	PBS	Proposed	88.54994	26.10374	Choto Balia, Balia, Thakurgaon Sadar, Thakurgaon
Thakurgaon PBS	THK	Rangpur Zone	Thakurgaon	50/82	2x25/41	Baliadangi-2	10	Indoor	PBS	Proposed	88.28564	26.15106	Thumnia, Dhontola, Baliadangi, Thakurgaon

103. In summary, the following specific activities need to be considered for assessing environmental and social impacts during construction phase of a 33/11 kV Substation:

- Purchase of land for Substation.
- Mobilization of material and equipment.
- Land development.
- Civil works, including design and construction of foundation for structures, boundary walls, guard room, etc.
- Installation of electrical equipment, including 33 kV and 11 kV Auto reclosers,
- 33/1.732/11/1.732 kV transformers, construction of Terminal structures for 33 and
- 11 kV lines; and
- Testing and commissioning of Substation.

a) Construction Phase of Substation (New & upgradation)

- **Materials**: Major material and equipment used in a substation are power transformers, breakers, CT. PT, Control panel, DC battery and charger, energy meters, relays, steel structure, Cable (Overhead & underground), metallic hardware, Bricks, stone, sand, cement, water, rod, etc.
- **Civil construction works**: Construction of control building, Safety tank, transformer pad, gantry structure, internal road, drainage system, security room, etc.
- **Electrical works:** Installation and commissioning of power transformer, breakers, CT. PT, Control panel, DC battery and charger, energy meters, relays, etc.
- **Estimated timeline/ Work schedule:** Average timeline for substation construction is about 12 months per contract.
- **Labor requirements:** All together about 30 persons are required for installation and commissioning of each substation throughout the construction period.
- **Resource use**: material and manpower resources for construction is provided by the turnkey contractors and BREB will provide Financial and technical support.
- **Solid waste and water management:** BREB will ensure on-site temporary sanitary system and supply of pure water for the workers during construction period. These facilities are provided by the contractors.

b) Operation Phase of Substation (New & upgradation)

104. BREB conducts regular operations and maintenance (O&M) works to keep the substation running. A dedicated technical team of BREB are assigned for each substation's regular O&M activities. Necessary material, equipment, and manpower, as mentioned above, are provider from BREB's own fund.

2. Augmentation of Existing Substations

105. The project will upgrade/modernize the capacities of 32 nos. 33/11 kV existing substations. Upgrading work involves increasing the capacity of transformers by installation of new (or replacement of existing) transformers, installation of bays, construction and renovation of existing control rooms, and installation of associated feeders. All work will be done within the premises of the existing substations. Works for upgrading and modernizing the existing substations will be limited within the boundary of the existing substation area and will be similar in nature to the works at new substations albeit limited in scope. Following repair and maintenance of existing substation components, the retired equipment will be dismantled and disposed of. This will largely involve manual work supported by a mobile crane and trucks for transportation of old transformers, switchgear, lines, and other waste lines to authorized third party vendors. Metal components will be delivered to recycling depots and non-recyclable waste disposed of by licensed contractors at registered landfills. The handling, transport, storage, and disposal of old transformers by third party vendors will be subject to approval from the concern authorities. Details PBS list of augmentation is given in the following table.

Table III-8: Details Technical information of augmented substation

PBS_Name	Sourc_Grid	Grid_Cap	SS_Name	NoF_Feeder	PeaK_Load	Longitude	Latitude	Address
Bogra PBS-1	Bogra Grid	260/390	Nandigram-1	9	17	89.266506	24.660007	Katham, Nandigram
Bogra PBS-1	Naogaon Grid	150/225	Dupchanchia-1	6	11	89.127535	24.850962	Chowmohoni, Chowmohoni, Dupcacia, Bogra
Bogra PBS-1	Bogra Grid	260/390	Shibganj-1	8	14	89.316733	25.023441	Amtoli Bazar,Post: Shibgonj, P.S: Shibgonj
Bogura PBS-2	Mohasthangarh Grid	160/240	Gabtoli-2	6	9.5	89.48793	24.93954	Sukanpukur,Gabtali,Bogra
Joypurhat PBS	Joypurhat	100/164	Khetlal-1	7	10	89.12884	25.02566	Itakhola,Khetlal,Joypurhat
Joypurhat PBS	Joypurhat	100/164	Panchbibi-1	6	10	89.03186	25.18422	Horihorpur,Panchbibi,Joypurhat
Naogaon PBS-1	Niamatpur	120/182	Manda-1	7	14	88.70472	24.75619	Barapoi,Kusumba, Manda, Naogaon
Naogaon PBS-1	Naogaon Grid	150/225	Naogaon (HQ)	7	8	88.91398	24.835258	Naogaon PBS-1, Chakbiram, Naogaon
Sirajganj PBS-1	Shahjadpur	170/250 MVA	Ullapara-1 HQ	13	20	89.576215	24.287131	Sirajgonj PBS-1 HQ, Ullapara R/S, Sirajgonj
Sirajganj PBS-1	Sirajganj	260/390 MVA	Tarash-1	8	17	89.508108	24.492959	Vuiagati, Raygonj, Sirajgonj
Sirajganj PBS-2	Sahajadpur	170/250	Belkuchi-1	11	23.5	89.69477	24.27485	Belkuchi Zonal Office, Sirajgonj
Sirajganj PBS-2	Sirajganj	160/241	Sirajgonj-2	5	7.5	89.63407	24.52943	Pipul Bariya A/O, Ghorachara, Sirajgonj
Chapai Nawabganj PBS	Amnura Grid	105/150	Chapainawabganj-4 (Gobratola)	5	0	88.29797	24.690803	Gobratola,nawabgonj, Chapainawabgonj
Chapai Nawabganj PBS	Amnura Grid	105/150	Shibgonj-2 (Dhobra)	5	0	88.14566	24.78888	Muslimpur,Shibgonj, Chapainawabgonj

PBS_Name	Sourc_Grid	Grid_Cap	SS_Name	NoF_Feeder	PeaK_Load	Longitude	Latitude	Address
Natore PBS-1	Rajshahi (Katakhali)	195/290	Puthia-2	4	8	88.74378	24.36877	Banesshwer, Rajshahi
Natore PBS-1	Natore	165/240	Puthia-1	6	9	88.846115	24.37839	Ganda Gohali, Puthia, Rajshahi
Natore PBS-2	Natore	165/240	Baraigram-3	5	10	89.12614	24.22015	Gormati, Baraigram, Natore
Natore PBS-2	Rajshahi (Katakhali)	195/290	Charghat-1	8	18	88.750049	24.288644	Charghat, Rajshahi
Pabna PBS-1	Bhangura Grid	100/150	Bhangura-1	6	10	89.388359	24.189793	Rokanpur,Bhangura, Pabna.
Pabna PBS-1	Bhangura Grid	100/150	Chatmohor-2	6	7	89.310425	24.28503	Katenga, Chatmohor, Pabna.
Pabna PBS-2	Sahajadpur	170/250	Kashinathpur(HQ)	9	13	89.603142	23.965754	Kashinathpur, Santhia, Pabna
Rajshahi PBS	Rajshahi (Katakhali)	195/290	Durgapur-1	6	14.1	88.759589	24.451356	Durgapur, Rajshahi
Rajshahi PBS	Rajshahi (N)	160/240	Paba-1	7	12	88.611671	24.466985	Naohata, Paba, Rajshahi
Rangpur PBS-2	Saidpur	135/207	Badargonj-1	5	7	89.078568	25.716147	Changmari Bazar,Modhupur,Badargonj,Rangpur
Rangpur PBS-2	Rangpur	185/281	Rangpur-1	8	10	89.13932	25.81143	Mohadebpur,Horidebpur,Rangpur Sadar,Rangpur
Dinajpur PBS-2	Barapukuria Grid	125/191	Birampur-1	9	14	88.994064	25.368082	Birampur, Birampur
Gaibandha PBS	Palasbari	150/232	Palashbari-1	2	5.5	89.34857	25.29297	Gridharipur, Palashbari
Gaibandha PBS	Palasbari	150/232	Gaibandha-1	0	0	89.475511	25.313661	Tulshighat, Shahapara, Gaibandha
Kurigram-Lalmonirhat PBS	Kurigram	100/150	Kurigram-1	8	7	89.60944	25.81098	Muktaram

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PBS_Name	Sourc_Grid	Grid_Cap	SS_Name	NoF_Feeder	PeaK_Load	Longitude	Latitude	Address
Kurigram-Lalmonirhat PBS	Lalmonirhat	125/183	Fulbari	5	8	89.5513	25.94237	Chandro Khana
Rangpur PBS-1	Rangpur	185/281	Sundarganj-1	0	10.6	89.516221	25.561886	Sundarganj
Rangpur PBS-1	Rangpur	185/281	Mithapukur-2	8	9.3	89.270042	25.630132	Baldipukur

3. New Distribution Lines

106. The project will involve erection of 3335 km of 33 kV and 3238 km of 11 kV or below distribution lines by 2028. The 33 kV new lines will connect new/upgraded substations from existing substations, whereas 11 kV new lines will be erected to connect new villages. The distribution line requires erection of poles, cables and other accessories. The new 33 kV and 11 kV lines will be mostly aligned along the ROW of existing rural roads although some sections may need to pass thorough agricultural or plantation areas; alignments will be determined following detailed line survey by contractors.

107. New distribution line works will involve staging and transportation of equipment, installation of poles for new lines, unrolling of cables, and installation. The new distribution line work will start with detailed route surveys to identify and locate poles and transformers along the route alignment adhering to the national electricity rules and EHS Guidelines on Distribution e.g., installation above or adjacent to residential properties or other locations intended for highly frequent human occupancy (e.g., schools or offices) will be avoided. This will be followed by surveys to ascertain the need to clear the ROW that may have vegetation to be trimmed etc.

Figure III.3: BREB's existing distribution line

108. Temporary labor camps will be setup and equipment (distribution poles, lines, and transformers) will be transported to the project construction site and temporary traffic diversions put in place. Digging of any foundation pits is done manually using auguring tools, concrete mixture for foundation is cast, and poles are unloaded for erection which is done using chain and pulley blocks. Then the pin insulators are mounted, and the stringing of new wires is done with correct sag to maintain prescribed ROW. Finally, for new lines the transformers are installed on single, double or four pole structures or ground mounted, for which earth works are required. The construction works for new distribution lines will involve minimal excavation and soil removal, to install new poles and any ground level transformers; new transformers and switchgear will however usually be pole mounted. There will be limited use of powered mechanical equipment other than cranes and trucks for equipment transportation. Much of the work will involve manual erection of equipment. The size of construction crew depends upon site conditions, the volume of work and techniques. Typically, a crew of 15 to 20 people will be employed, around 2-3 weeks of work will then be needed for the construction of a 1 km section of 33 kV or 11 kV line. The standard width of the ROW is 10' from the center of the line to either side (both 33 kV and 11 kV lines). The land area that would be affected by the ROW will be finalized during detail design stage.

a) Construction phase of distribution line

- **Materials**: Major material and equipment used in a distribution line are pole, conductors, cross-arm, anchor-log, insulator, distribution transformer, capacitor, hardware, etc.
- **Civil construction works**: Installation of pole, staining of conductor, digging for anchor log, fittings of hardware, etc.

- **Electrical works:** distribution line energization, shut-down, load bi-furcation. etc.
- **Estimated timeline/ Work schedule:** Average timeline for construction of distribution line is about 02 weeks per km.
- **Labor requirements:** Altogether about 10-12 persons are required for construction of 1 km distribution line within the duration of 02 weeks.
- **Resource use**: Manpower resources/ labor for construction is provided by the line construction contractors and BREB will provide material, financial and technical support.
- **Solid waste and water management:** BREB will ensure on-site temporary sanitary system and supply of pure water for the workers during construction period. These facilities are provided by the contractors.

b) Operation phase of distribution line

109. BREB conducts regular operations and maintenance (O&M) works to keep the distribution line in running. A dedicated technical team of BREB are assigned for each distribution feeder's regular O&M activities. Necessary material, equipment, and manpower, as mentioned above, are provider from BREB's own fund. Here we have enclosed the existing 33 kV line for Dinajpur PBS and proposed backbone line for a proposed substation is given below:

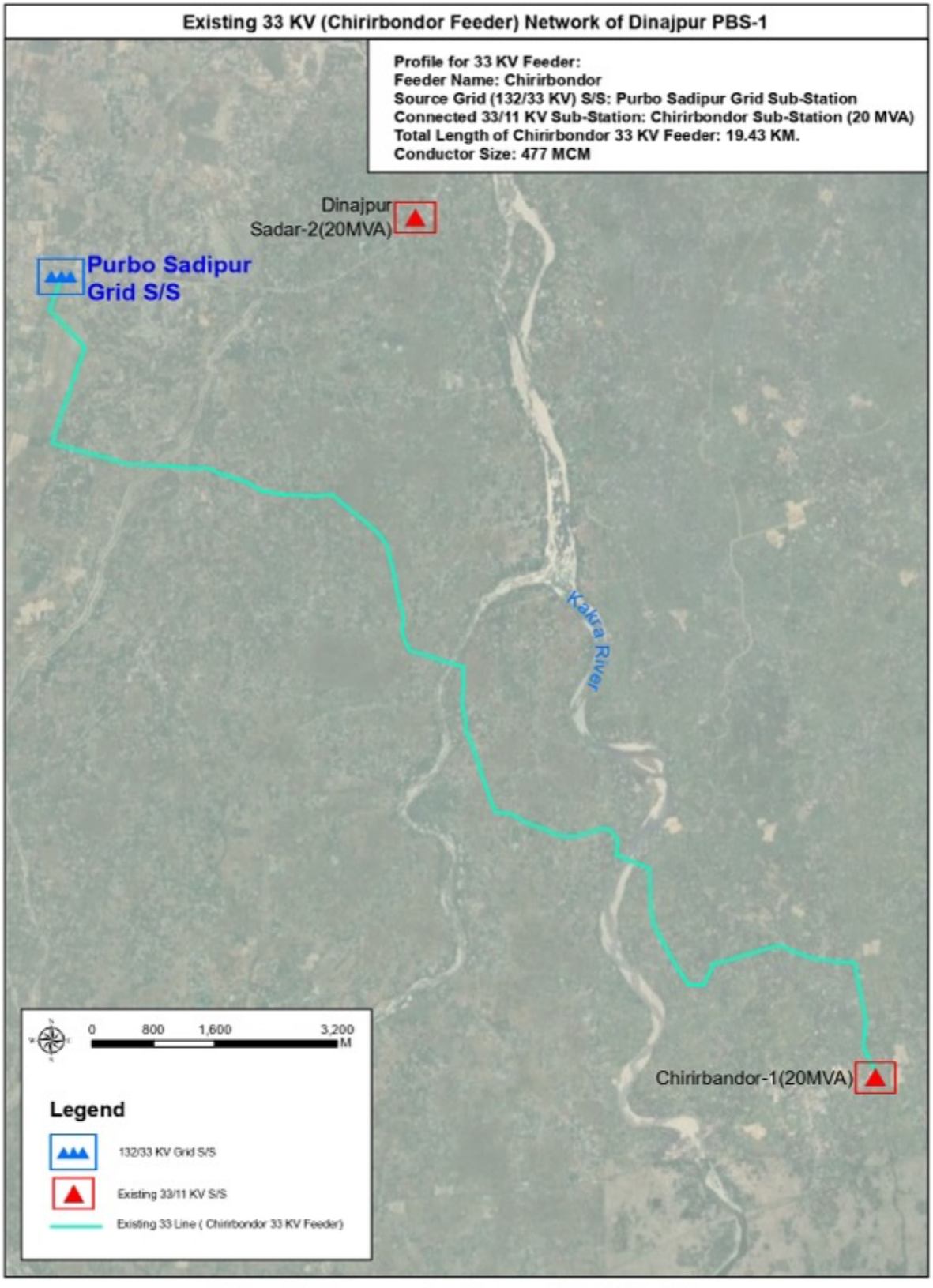

Figure III.4: Existing 33 kV distribution network of Dinajpur PBS-01

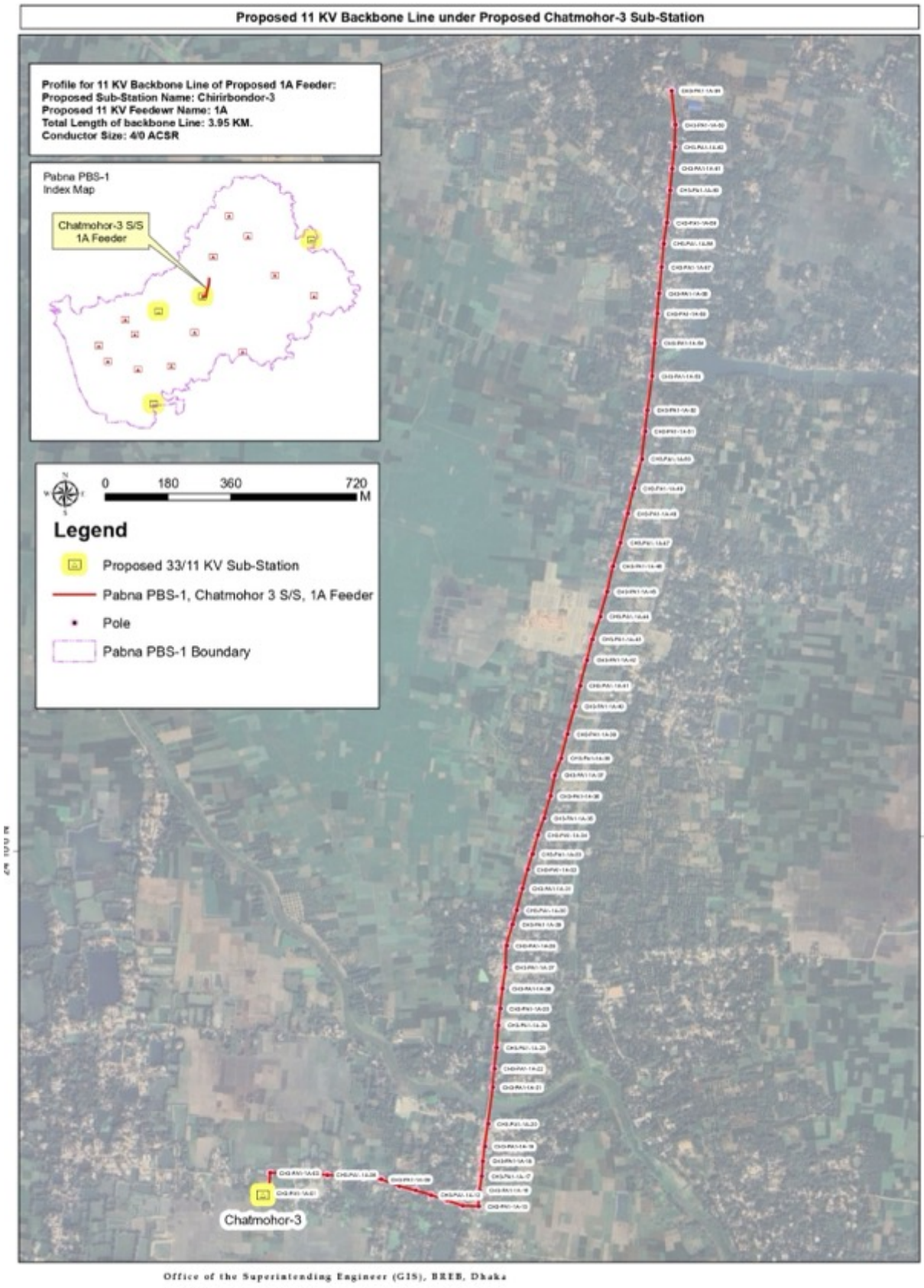

Figure III.5: Proposed 11 kV Backbone line under proposed Chatmohor-3 Substation

4. River Crossing Tower

110. A total of six (06) river crossing towers will be constructed, having very minimal impact over the surrounding environment. The main reason for the minimal impact is that all of the river crossing towers will be constructed far away from the riverbank and there are no possibilities if flood and erosion. Generally, a river crossing tower is a set of four towers. Two are main suspension tower and the rest of the two are anchor tower. In some cased in river crossing location existing poles will be replaced by the tower.

Table III-9: River Crossing tower under the proposed project

Sl.	Name of the PBS	No of RCT	Name of the River	Crossing width	Crossing point
1	Chapainawabganj	1	Mohananda	340	Parartola to Char Arupnagar
2	Dinajpur-1	2	Kakra, Purnavaba	183,190	Rabardam bazar, Sonkoir Rabardam, Ghuhu bhanga, Jomidar bari
3	Thakurgaon	1	Korotoa	243	Bongram
4	Gaibandha	2	Korotoa	335,250	Hossainpur, Palashbari to to fulhar, Gobindaganj

111. The towers for the river crossing will be constructed far away from the riverbanks to avoid any impacts on the aquatic resources and river-based activities such as navigation activities like passenger and cargo transport, boats, ferries, fishing etc. To construct river crossing tower, BREB will obtain navigation clearance from BIWTA (Bangladesh Inland Water Transport Authority). The clearance for the tower lines will be fixed upon considering river navigation class of BIWTA. From earlier experience of BREB, it has been anticipated that the four rivers are classified as Class 3 where vertical clearance is 12.19 meters and horizontal clearance is 30.48 meters.

Table III-10: Detail Tower information

Tower Code	PBS Name	River Name	Suspension	Address	Latitude	Longitude
T-1	Chapai Nawabganj PBS	Mahananda	ST-1	Paraltola (Harma) to Char Onup Nagor	24.513841	88.279358
T-1	Chapai Nawabganj PBS	Mahananda	AT-1	Paraltola (Harma) to Char Onup Nagor	24.513531	88.2787
T-1	Chapai Nawabganj PBS	Mahananda	ST-2	Paraltola (Harma) to Char Onup Nagor	24.515493	88.282869
T-1	Chapai Nawabganj PBS	Mahananda	AT-2	Paraltola (Harma) to Char Onup Nagor	24.515801	88.283529
T-2	Dinajpur PBS-1	Punarbhaba	ST-1	Rubberdam Bazar, Shonkoiro, Dinajpur	25.563337	88.581872
T-2	Dinajpur PBS-1	Punarbhaba	AT-1	Rubberdam Bazar, Shonkoiro, Dinajpur	25.56362	88.581194
T-2	Dinajpur PBS-1	Punarbhaba	ST-2	Rubberdam Bazar, Shonkoiro, Dinajpur	25.561864	88.585398
T-2	Dinajpur PBS-1	Punarbhaba	AT-2	Rubberdam Bazar, Shonkoiro, Dinajpur	25.561581	88.586076
T-3	Dinajpur PBS-1	Kakra	ST-1	Rubberdam , Ghughubhanga,	25.68514	88.751009

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Tower Code	PBS Name	River Name	Suspension	Address	Latitude	Longitude
				Jomidarbari, Dinajpur		
T-3	Dinajpur PBS-1	Kakra	AT-1	Rubberdam , Ghughubhanga, Jomidarbari, Dinajpur	25.685248	88.750735
T-3	Dinajpur PBS-1	Kakra	ST-2	Rubberdam , Ghughubhanga, Jomidarbari, Dinajpur	25.684407	88.752884
T-3	Dinajpur PBS-1	Kakra	AT-2	Rubberdam , Ghughubhanga, Jomidarbari, Dinajpur	25.6843	88.753158
T-4	Thakurgaon PBS	Karatoya	ST-1	Banghari (Shikarpur), Thakurpara, Bongram, Boda.	26.28524	88.603212
T-4	Thakurgaon PBS	Karatoya	AT-1	Banghari (Shikarpur), Thakurpara, Bongram, Boda.	26.28524	88.60171
T-4	Thakurgaon PBS	Karatoya	ST-2	Banghari (Shikarpur), Thakurpara, Bongram, Boda.	26.28524	88.60944
T-4	Thakurgaon PBS	Karatoya	AT-2	Banghari (Shikarpur), Thakurpara, Bongram, Boda.	26.28524	88.610942
T-5	Gaibandha PBS	Karatoya	ST-1	Hossainpur, Polashbari to Fulhar, Katabari, Gobindoganj	25.2296	89.31227
T-5	Gaibandha PBS	Karatoya	AT-1	Hossainpur, Polashbari to Fulhar, Katabari, Gobindoganj	25.229959	89.312229
T-5	Gaibandha PBS	Karatoya	ST-2	Hossainpur, Polashbari to Fulhar, Katabari, Gobindoganj	25.227221	89.312544
T-5	Gaibandha PBS	Karatoya	AT-2	Hossainpur, Polashbari to Fulhar, Katabari, Gobindoganj	25.226862	89.312586
T-6	Gaibandha PBS	Karatoya	ST-1	Balubhora, Dorbasto, Gobindoganj to Sahebganj, Katabari, Gobindoganj	25.166786	89.387067
T-6	Gaibandha PBS	Karatoya	AT-1	Balubhora, Dorbasto,	25.167216	89.386917

Tower Code	PBS Name	River Name	Suspension	Address	Latitude	Longitude
				Gobindoganj to Sahebganj, Katabari, Gobindoganj		
T-6	Gaibandha PBS	Karatoya	ST-2	Balubhora, Dorbasto, Gobindoganj to Sahebganj, Katabari, Gobindoganj	25.164635	89.387816
T-6	Gaibandha PBS	Karatoya	AT-2	Balubhora, Dorbasto, Gobindoganj to Sahebganj, Katabari, Gobindoganj	25.164205	89.387966

a) Construction phase of River crossing Tower

- **Materials**: Major material and equipment used in a river crossing tower are steel bar, conductors, insulator, hardware, bricks, stone, sand, cement, water, rod etc.
- **Civil construction works**: Installation of anchor tower, suspension tower, staining of conductor, tower base foundation, fittings of hardware, etc.
- **Electrical works:** distribution line energization.
- **Estimated timeline/ Work schedule:** Average timeline for construction of river crossing tower is about 06 months per set.
- **Labor requirements:** Altogether about 30 persons are required for construction of each set of rivers crossing tower within the duration of 06 months.
- **Resource use**: Manpower resources/ labor for construction is provided by the river crossing tower construction contractors (turnkey) and BREB will provide material, financial and technical support.
- **Solid waste and water management:** BREB will ensure on-site temporary sanitary system and supply of pure water for the workers during construction period. These facilities are provided by the contractors.

Table III-11: Sensitive Receptor surrounding the river crossing tower

Tower Code	PBS Name	River Name	Latitude	Longitude	Sensitive Receptor	Distance
T-3	Dinajpur PBS-1	Kakra	25.68544	88.75091	Sankair Kakra nodi rubberdan junior School	200 m
T-3	Dinajpur PBS-1	Kakra	25.68544	88.75091	Residential area	140 m
T-5	Gaibandha PBS	Karatoya	25.23144	89.31055	Bannakera Govt. Primary School	150
T-5	Gaibandha PBS	Karatoya	25.23122	89.31070	Kadomtoli High School	160m
T-5	Gaibandha PBS	Karatoya	25.23152	89.31097	Kadomtoli Hafezia Madrasha	100 m

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Tower Code	PBS Name	River Name	Latitude	Longitude	Sensitive Receptor	Distance
T-5	Gaibandha PBS	Karatoya	25.23152	89.31097	Residential area	440 m

b) Operation phase of River crossing Tower

112. BREB conducts regular operations and maintenance (O&M) works to keep the distribution line running. A dedicated technical team of BREB are assigned for each distribution feeder's regular O&M activities. Necessary material, equipment and manpower, as mentioned above, are provider from BREB's own fund. The details schematic map has been prepared for the proposed river crossing tower which have been given below:

Figure III.6: Project location on proposed Kakra river crossing tower

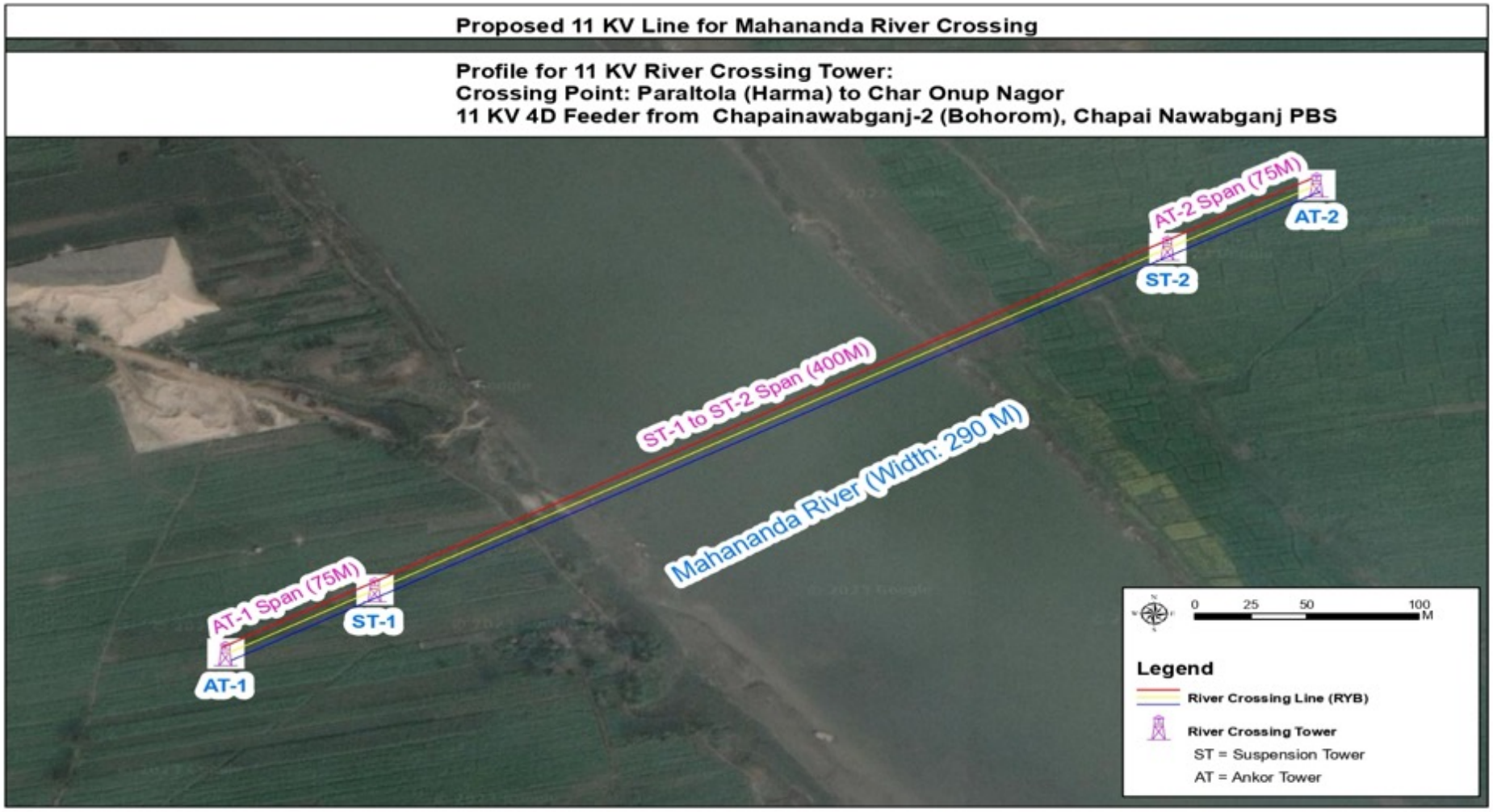

Figure III.7: Proposed 11 kV line for Mahanada River Crossing

Figure III.8: Proposed 11 kV line for Kakra River Crossing

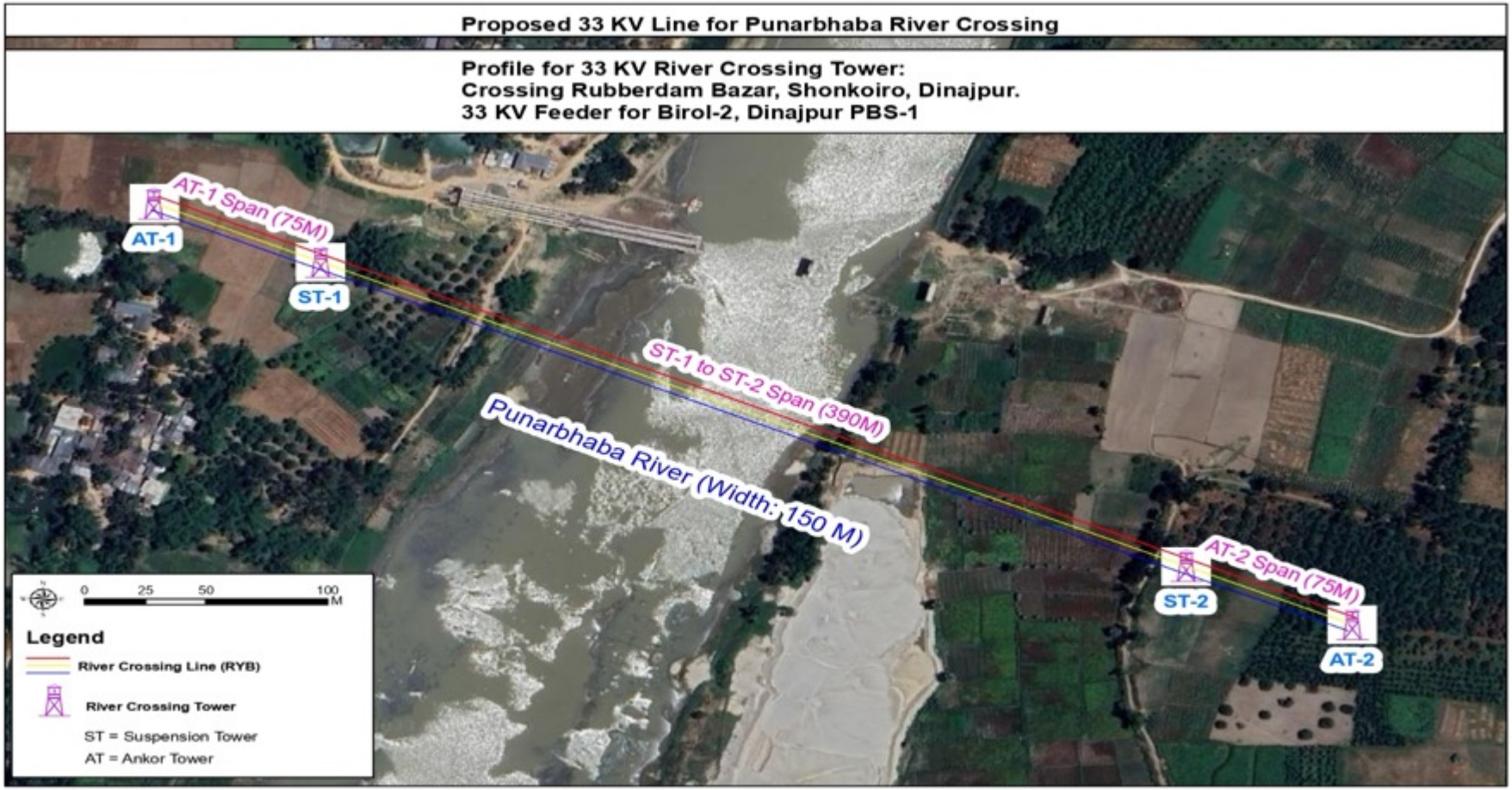

Figure III.9: Proposed 11 kV line for Purnabhba River Crossing

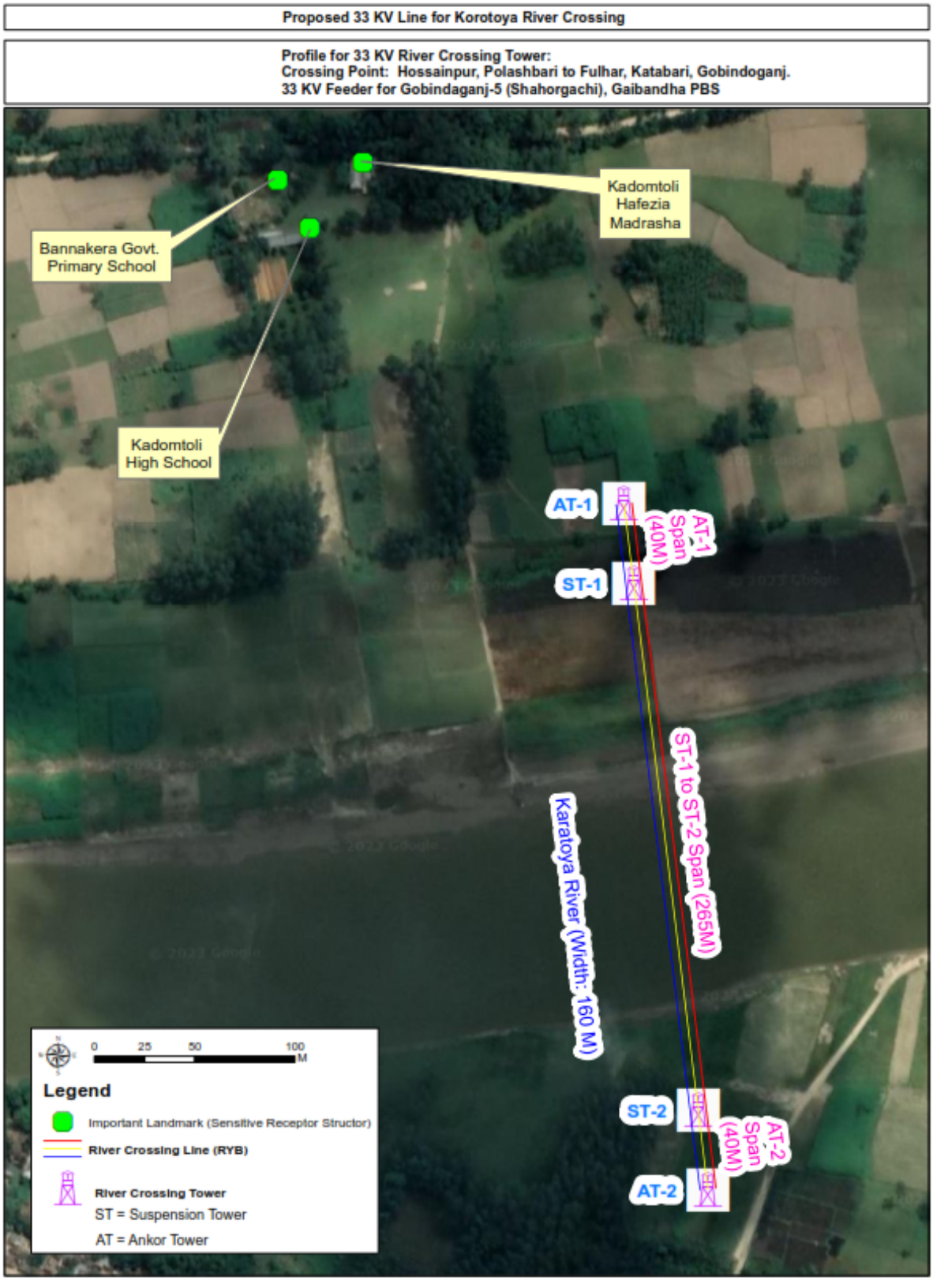

Figure III.10: Proposed 11 kV line for Korotoya River Crossing at Gobindoganj-5

Figure III.11: Proposed 11 kV line for Korotoya River Crossing at Gobindoganj-1

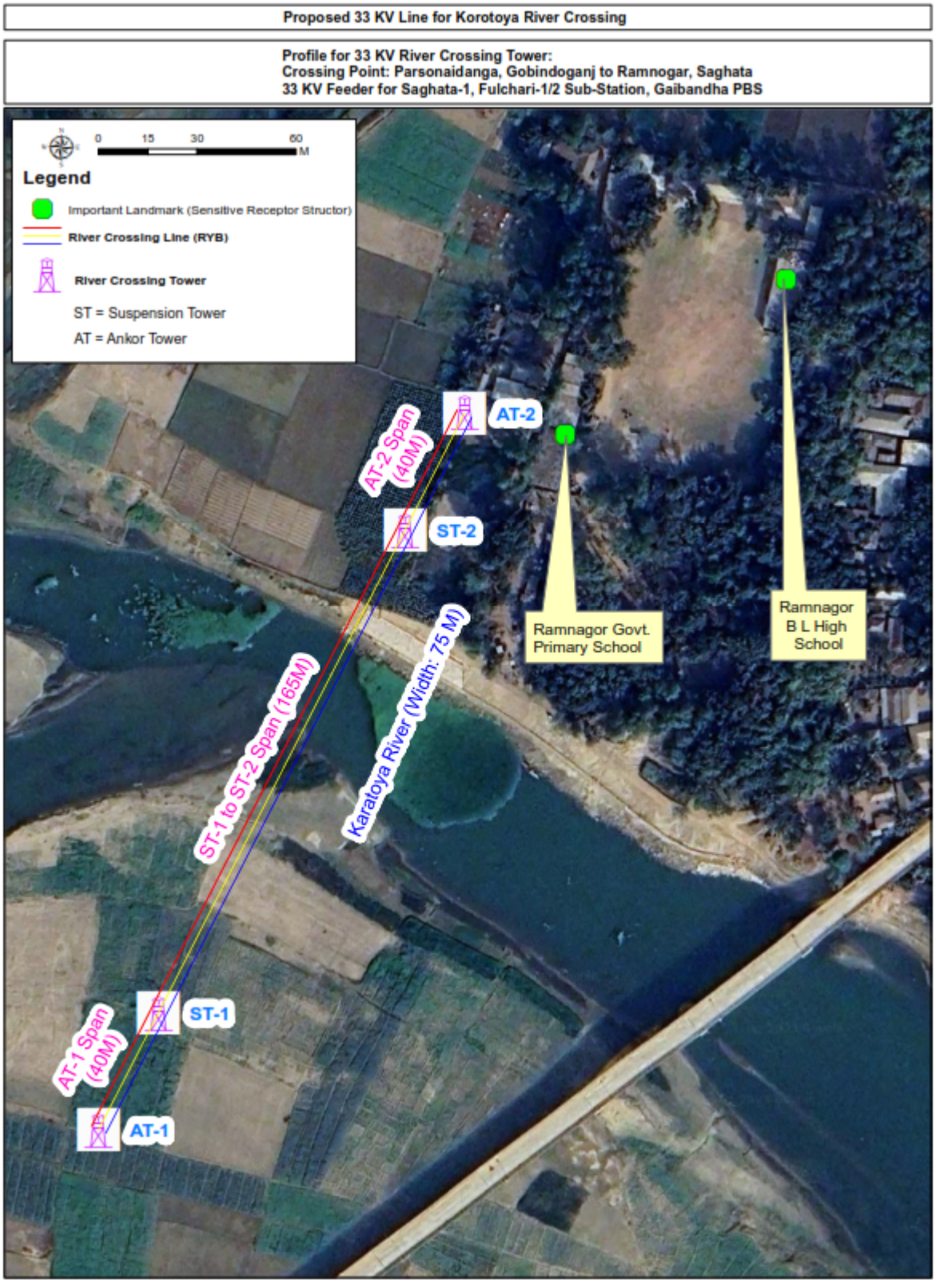

Figure III.12: Proposed 11 kV line for Korotoya River Crossing at Saghata-1

5. Reconstruction of 314 km line in flood prone area

113. Another important component of the project is to reconstruct a 314 Km line in flood prone areas. Under this component the major activity will be replacement of old pole by new pole by increasing pole height as well as using flood-resistant materials for poles, transformers, and other equipment enhances their ability to withstand floodwater exposure.

114. In addition, Use of additional pole to reduce the span length building robust network against cyclone/ storm. Others material (Hardware, insulator, x-arm, anchor log etc. except conductor) which is related to the additional pole use in flood prone area.

115. The detailed list of the flood prone areas under this project in the given table as well as a map of flood prone areas has been prepared for this proposed project.

Table III-12: Flood Prone area under the proposed project

SL	SE_Zone	PBS Name	Union	Affected Line_KM	Division	District	Upazilla
1	Bogra Zone	Bogra PBS-2	Kutubpur	0.3	RAJSHAHI	BOGRA	Sariakandi
2	Bogra Zone	Bogra PBS-2	Fulbari	0.3	RAJSHAHI	BOGRA	Gabtali
3	Bogra Zone	Bogra PBS-2	Kamalpur	0.5	RAJSHAHI	BOGRA	Dhunat
4	Bogra Zone	Bogra PBS-2	Chandan Baisha	0.5	RAJSHAHI	BOGRA	Sariakandi
5	Bogra Zone	Bogra PBS-2	Bhelabari	0.5	RAJSHAHI	BOGRA	Dhunat
6	Bogra Zone	Bogra PBS-2	Hat Sherpur	1.0	RAJSHAHI	BOGRA	Sariakandi
7	Bogra Zone	Bogra PBS-2	Sariakandi	1.0	RAJSHAHI	BOGRA	Sariakandi
8	Bogra Zone	Naogaon PBS-1	Kamargaon	0.3	RAJSHAHI	NAOGAON	Manda
9	Bogra Zone	Naogaon PBS-1	Royghati	0.5	RAJSHAHI	NAOGAON	Manda
10	Bogra Zone	Sirajganj PBS-1	Dhukaria Bera	0.2	RAJSHAHI	SIRAJGANJ	Belkuchi
11	Bogra Zone	Sirajganj PBS-1	Bhadraghat	0.3	RAJSHAHI	SIRAJGANJ	Kamarkhanda
12	Bogra Zone	Sirajganj PBS-1	Sonatani	0.5	RAJSHAHI	SIRAJGANJ	Chauhali
13	Bogra Zone	Sirajganj PBS-1	Narnia	1.0	RAJSHAHI	SIRAJGANJ	Shahjadpur
14	Bogra Zone	Sirajganj PBS-1	Sadia Chandpur	1.3	DHAKA	TANGAIL	Tangail Sadar
15	Bogra Zone	Sirajganj PBS-1	Nagdemra	1.5	RAJSHAHI	PABNA	Faridpur
16	Bogra Zone	Sirajganj PBS-1	Baruhas	10.0	RAJSHAHI	NATORE	Singra
17	Bogra Zone	Sirajganj PBS-1	Magura Binod	10.0	RAJSHAHI	NATORE	Gurudaspur
18	Bogra Zone	Sirajganj PBS-1	Saguna	10.0	RAJSHAHI	NATORE	Gurudaspur
19	Bogra Zone	Sirajganj PBS-1	Bara Pangashi	13.0	RAJSHAHI	SIRAJGANJ	Ullahpara

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SL	SE_Zone	PBS Name	Union	Affected Line_KM	Division	District	Upazilla
20	Bogra Zone	Sirajganj PBS-1	Udhunia	16.5	RAJSHAHI	PABNA	Bhangura
21	Bogra Zone	Sirajganj PBS-1	Khukni	2.0	RAJSHAHI	SIRAJGANJ	Belkuchi
22	Bogra Zone	Sirajganj PBS-1	Shahjadpur	2.0	RAJSHAHI	SIRAJGANJ	Shahjadpur
23	Bogra Zone	Sirajganj PBS-1	Pourasabha	2.0	RAJSHAHI	SIRAJGANJ	Shahjadpur
24	Bogra Zone	Sirajganj PBS-1	Ratankandi	2.0	RAJSHAHI	BOGRA	Dhunat
25	Bogra Zone	Sirajganj PBS-1	Dil Pasar	3.0	RAJSHAHI	PABNA	Bhangura
26	Bogra Zone	Sirajganj PBS-1	Pancha Krushi	3.0	RAJSHAHI	SIRAJGANJ	Belkuchi
27	Bogra Zone	Sirajganj PBS-1	Jalalpur	3.0	RAJSHAHI	SIRAJGANJ	Chauhali
28	Bogra Zone	Sirajganj PBS-1	Potajia	3.0	RAJSHAHI	PABNA	Faridpur
29	Bogra Zone	Sirajganj PBS-1	Rupabati	3.0	RAJSHAHI	PABNA	Bera
30	Bogra Zone	Sirajganj PBS-1	Garadaha	3.0	RAJSHAHI	SIRAJGANJ	Shahjadpur
31	Bogra Zone	Sirajganj PBS-1	Koyra	3.0	RAJSHAHI	SIRAJGANJ	Ullahpara
32	Bogra Zone	Sirajganj PBS-1	Kaijuri	3.5	RAJSHAHI	SIRAJGANJ	Chauhali
33	Bogra Zone	Sirajganj PBS-1	Mohanpur	4.0	RAJSHAHI	PABNA	Bhangura
34	Bogra Zone	Sirajganj PBS-1	Kayempur	4.0	RAJSHAHI	PABNA	Faridpur
35	Bogra Zone	Sirajganj PBS-1	Bangala	5.0	RAJSHAHI	SIRAJGANJ	Tarash
36	Bogra Zone	Sirajganj PBS-1	Beltail	5.0	RAJSHAHI	SIRAJGANJ	Belkuchi
37	Bogra Zone	Sirajganj PBS-1	Porjana	5.0	RAJSHAHI	SIRAJGANJ	Shahjadpur
38	Bogra Zone	Sirajganj PBS-1	Salap	5.5	RAJSHAHI	SIRAJGANJ	Ullahpara
39	Bogra Zone	Sirajganj PBS-1	Pungali	6.0	RAJSHAHI	PABNA	Faridpur
40	Bogra Zone	Sirajganj PBS-1	Gala	6.0	RAJSHAHI	PABNA	Bera
41	Bogra Zone	Sirajganj PBS-1	Khan Marich	7.0	RAJSHAHI	PABNA	Bhangura
42	Bogra Zone	Sirajganj PBS-1	Bri-Lahiribari	7.0	RAJSHAHI	PABNA	Bhangura
43	Bogra Zone	Sirajganj PBS-1	Handial	7.0	RAJSHAHI	NATORE	Gurudaspur
44	Bogra Zone	Sirajganj PBS-2	Rajapur	1.0	DHAKA	TANGAIL	Kalihati
45	Bogra Zone	Sirajganj PBS-2	Subhagachha	2.0	RAJSHAHI	SIRAJGANJ	Kazipur
46	Bogra Zone	Sirajganj PBS-2	Maijbari	3.0	RAJSHAHI	BOGRA	Dhunat

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SL	SE_Zone	PBS Name	Union	Affected Line_KM	Division	District	Upazilla
47	Bogra Zone	Sirajganj PBS-2	Kazipur	3.3	RAJSHAHI	SIRAJGANJ	Kazipur
48	Bogra Zone	Sirajganj PBS-2	Saidabad	4.2	DHAKA	TANGAIL	Bhuapur
49	Bogra Zone	Sirajganj PBS-2	Belkuchi	4.2	DHAKA	TANGAIL	Kalihati
50	Bogra Zone	Sirajganj PBS-2	Khoksabari	4.5	RAJSHAHI	SIRAJGANJ	Sirajganj Sadar
51	Bogra Zone	Sirajganj PBS-2	Chhangachha	5.0	RAJSHAHI	SIRAJGANJ	Kazipur
52	Rajshahi Zone	Natore PBS-2	Haripur	2.0	RAJSHAHI	NATORE	Baraigram
53	Rajshahi Zone	Natore PBS-2	Chhaikhola	5.0	RAJSHAHI	NATORE	Baraigram
54	Rajshahi Zone	Pabna PBS-1	Char Sadipur	0.5	KHULNA	KUSHTIA	Kumarkhali
55	Rajshahi Zone	Pabna PBS-1	Gunaigachha	2.0	RAJSHAHI	PABNA	Bhangura
56	Rajshahi Zone	Pabna PBS-1	Bilchalon	3.0	RAJSHAHI	PABNA	Bhangura
57	Rajshahi Zone	Pabna PBS-1	Hadal	4.0	RAJSHAHI	PABNA	Atgharia
58	Rajshahi Zone	Pabna PBS-1	Faridpur	4.0	RAJSHAHI	PABNA	Bhangura
59	Rajshahi Zone	Pabna PBS-1	Banwarinagar	4.0	RAJSHAHI	PABNA	Faridpur
60	Rajshahi Zone	Pabna PBS-1	Ashta Manisha	7.0	RAJSHAHI	PABNA	Bhangura
61	Rajshahi Zone	Pabna PBS-1	Parbhanguria	8.0	RAJSHAHI	PABNA	Bhangura
62	Rajshahi Zone	Pabna PBS-2	Bharara	2.0	DHAKA	RAJBARI	Pangsha
63	Rajshahi Zone	Pabna PBS-2	Karanja	1.5	RAJSHAHI	PABNA	Bera
64	Rajshahi Zone	Pabna PBS-2	Ahammedpur	2.0	RAJSHAHI	PABNA	Bera
65	Rajshahi Zone	Pabna PBS-2	Manikhat	2.0	RAJSHAHI	PABNA	Sujanagar
66	Rajshahi Zone	Pabna PBS-2	Dulai	2.5	RAJSHAHI	PABNA	Santhia
67	Rajshahi Zone	Rajshahi PBS	Dhurail	0.3	RAJSHAHI	RAJSHAHI	Mohanpur
68	Rajshahi Zone	Rajshahi PBS	Ghasigram	0.5	RAJSHAHI	RAJSHAHI	Mohanpur
69	Rangpur Zone	Gaibandha PBS	Sreepur	2.0	RANGPUR	GAIBANDHA	Gaibandha Sadar
70	Rangpur Zone	Gaibandha PBS	Banagram	1.0	RANGPUR	GAIBANDHA	Gaibandha Sadar
71	Rangpur Zone	Gaibandha PBS	Kachua	10.0	RANGPUR	GAIBANDHA	Gobindaganj
72	Rangpur Zone	Gaibandha PBS	Chaluabari	4.0	DHAKA	JAMALPUR	Islampur
73	Rangpur Zone	Gaibandha PBS	Gazaria	5.0	RANGPUR	GAIBANDHA	Fulchhari

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SL	SE_Zone	PBS Name	Union	Affected Line_KM	Division	District	Upazilla
74	Rangpur Zone	Gaibandha PBS	Kanchi Para	5.0	RANGPUR	GAIBANDHA	Fulchhari
75	Rangpur Zone	Gaibandha PBS	Uria	5.0	RANGPUR	GAIBANDHA	Fulchhari
76	Rangpur Zone	Gaibandha PBS	Kishoregari	7.0	RANGPUR	DINAJPUR	Ghoraghat
77	Rangpur Zone	Gaibandha PBS	Boali	8.0	RANGPUR	GAIBANDHA	Fulchhari
78	Rangpur Zone	Gaibandha PBS	Betkapa	9.0	RANGPUR	GAIBANDHA	Gaibandha Sadar
79	Rangpur Zone	Kurigram-Lalmonirhat PBS	Andhari Jhar	0.5	RANGPUR	KURIGRAM	Bhurungamari
80	Rangpur Zone	Kurigram-Lalmonirhat PBS	Boldia	0.5	RANGPUR	KURIGRAM	Bhurungamari
81	Rangpur Zone	Kurigram-Lalmonirhat PBS	Paiker Chhara	0.5	RANGPUR	KURIGRAM	Bhurungamari
82	Rangpur Zone	Kurigram-Lalmonirhat PBS	Shilkhuri	0.5	RANGPUR	KURIGRAM	Bhurungamari
83	Rangpur Zone	Kurigram-Lalmonirhat PBS	Tilai	0.5	RANGPUR	KURIGRAM	Bhurungamari
84	Rangpur Zone	Kurigram-Lalmonirhat PBS	Kaliganj	0.5	RANGPUR	KURIGRAM	Nageshwari
85	Rangpur Zone	Kurigram-Lalmonirhat PBS	Noonkhawa	0.5	RANGPUR	KURIGRAM	Kurigram Sadar
86	Rangpur Zone	Kurigram-Lalmonirhat PBS	Bazra	0.5	RANGPUR	GAIBANDHA	Sundarganj
87	Rangpur Zone	Kurigram-Lalmonirhat PBS	Mogalbachha	0.5	RANGPUR	KURIGRAM	Kurigram Sadar
88	Rangpur Zone	Kurigram-Lalmonirhat PBS	Gharialdanga	0.5	RANGPUR	KURIGRAM	Rajarhat
89	Rangpur Zone	Kurigram-Lalmonirhat PBS	Chilmari	0.5	RANGPUR	GAIBANDHA	Sundarganj
90	Rangpur Zone	Kurigram-Lalmonirhat PBS	Chhinai	0.5	RANGPUR	KURIGRAM	Kurigram Sadar
91	Rangpur Zone	Kurigram-Lalmonirhat PBS	Bamandanga	0.5	RANGPUR	KURIGRAM	Bhurungamari
92	Rangpur Zone	Kurigram-Lalmonirhat PBS	Narayanpur	0.5	RANGPUR	KURIGRAM	Kurigram Sadar
93	Rangpur Zone	Kurigram-Lalmonirhat PBS	Jatrapur	0.5	RANGPUR	KURIGRAM	Kurigram Sadar

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SL	SE_Zone	PBS Name	Union	Affected Line_KM	Division	District	Upazilla
94	Rangpur Zone	Kurigram-Lalmonirhat PBS	Bidyananda	0.5	RANGPUR	KURIGRAM	Rajarhat
95	Rangpur Zone	Kurigram-Lalmonirhat PBS	Haripur	2.0	RANGPUR	GAIBANDHA	Sundarganj
96	Rangpur Zone	Kurigram-Lalmonirhat PBS	Belka	1.0	RANGPUR	GAIBANDHA	Sundarganj
97	Rangpur Zone	Kurigram-Lalmonirhat PBS	Kapasia	2.0	RANGPUR	GAIBANDHA	Gaibandha Sadar
98	Rangpur Zone	Rangpur PBS-1	Chandipur	1.0	RANGPUR	GAIBANDHA	Sundarganj
99	Rangpur Zone	Rangpur PBS-1	Rasulpur	2.0	RANGPUR	GAIBANDHA	Sadullapur
100	Rangpur Zone	Rangpur PBS-1	Damodarpur	2.0	RANGPUR	GAIBANDHA	Sadullapur
Total (Rajshahi & Rangpur) Division				**314**			

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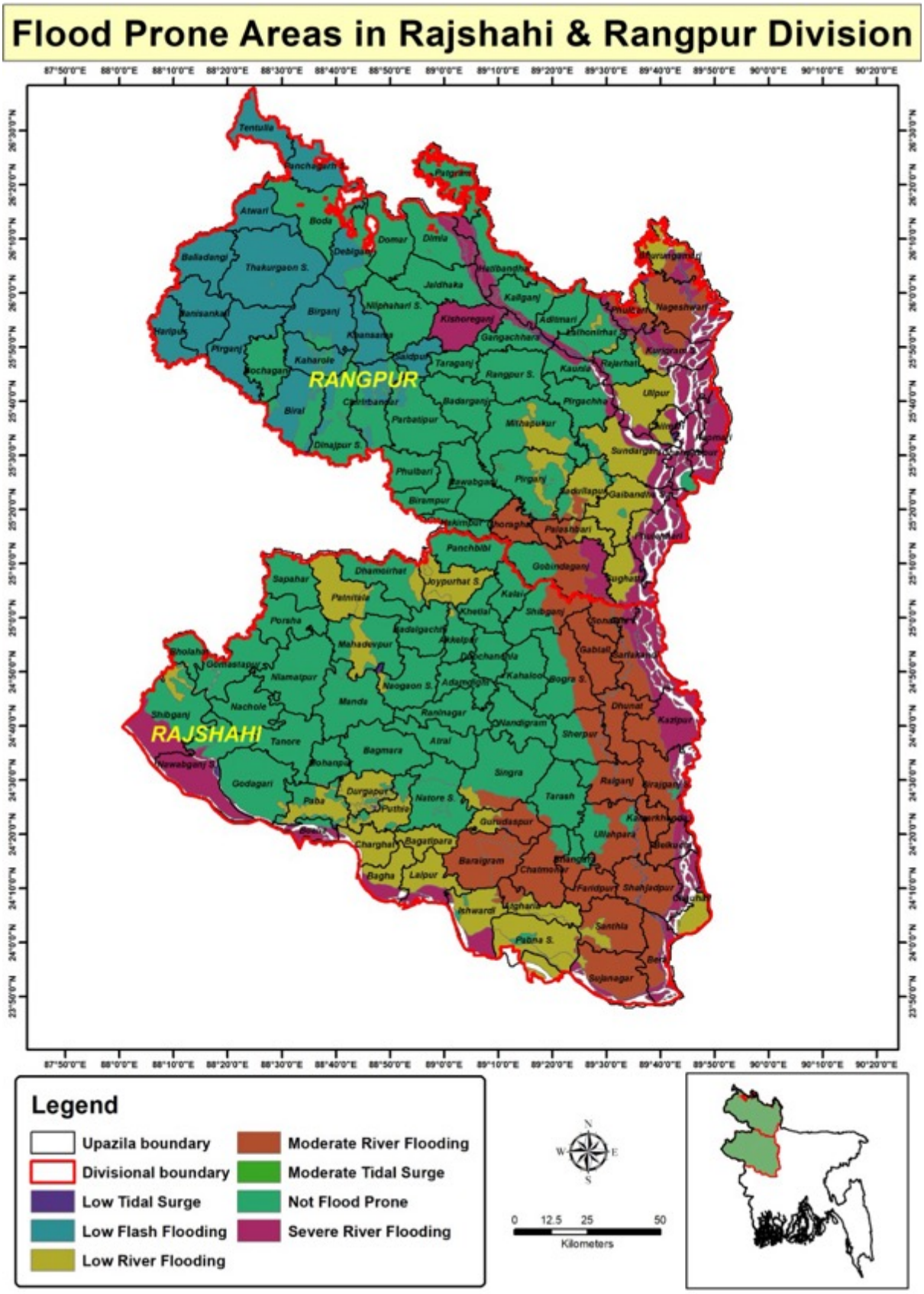


Figure III.13: Flood Prone area map under Rajshai-Rangpur division.

6. Underground Cable

116. Underground cable installation only applies to cables within the indoor S/S for internal connection. These are not underground distribution lines spanning kilometers across roads, private or public land. The provision of construction of new underground lines (48km 33 kV and 60 km 11kV) is considered only where overhead line is not possible at all to construct for energization purposes. Some pictures are given below.


Figure III.14 Underground cable passing through the slab to indoor S/S

a) Methods of Laying Underground Cable

117. For laying the underground cable, BREB is considering 2 criteria for installation, depth of cable installation and clearance of cable installation. These two considerations are mentioned below:

Table III-13: Depth of cable installation

33 kV	1.0 m
11kV cable	1.0 m
Low voltage and control cable	0.6 m
Cable under road crossing	---- 1.0 m
Cable at railway crossings	--- 1.0 m

Table III-14: Clearance of cable installation

Power Cable to Power Cable	No restriction, more the distance better the current carrying capacity
Power Cable to Control Cable	0.2 m
Power Cable to Communication Cable	0.3 m
Power Cable to Gas and Water Main	0.3 m

G. PROJECT PLAN

118. BREB has planned to alleviate the insufficient electricity supply condition of the north-western part of Bangladesh. With this in view, 21 PBS has been selected under division to be upgraded into modern & sustainable electricity distribution network for the growing electricity demand. In earlier times due to lack of proper transport system and communication, load growth was not increased. But current connectivity level, BREB has adopted a new model.

119. Based on the information/ data as collected, summary statement was prepared on requirement of 33 kV line and 11 kV & Below Voltage line, insulated conductor, LT to HT conversion, River crossing tower, 33/11 kV Substation, Present Average/peak Demand, Forecasted Average/peak Demand up to 2028.

120. The overall objectives of the project are:

- To upgrade and enhance 1385 MVA capacity of rural electrical distribution network by 30 June 2028 to meet-up increasing demand of electricity in the project areas.
- To access an uninterruptible, reliable, affordable & efficient power supply for 8.6 million existing consumers, reducing 2.15% system loss and 15% SAIDI.

System up to 2028:

- To construct 84 nos. of +1190 MVA 33/11 kV new Substations
- To upgrade (Augmentation) 32 nos. of 33/11 kV (total 195 MVA extension) existing Substations.
- To construct/conversion of 6465 km of 33 kV and below line (New/ Upgradation/ Underground line).
- Installation of 4800 km Insulated Conductor
- Conversion of 3350 km LT to HT line
- Conversion of 4560 km HT 1-ph to HT 3-ph line
- To construct 06 sets of River Crossing Tower
- Installation of SCADA System for 5 Substations in Rangpur PBS-1
- Reconstruction of 314 km line in flood prone area.
- Installation of 4990 fault locator.

H. RESOURCES AND UTILITY DEMAND

1. Water

121. Water will be required for construction work and the same will be sourced from existing tube-well during augmentation work, wherever available. In case of non-availability of tube well, a contractor will procure water from a nearby source. During the construction of the new substation, the contractor will install a tube well for procuring water. In the case of construction of ground water abstraction units (tube wells) at Project site, then licenses will need to be obtained prior to installation of any tube-wells.

2. Land

122. Sufficient land is available at the fenced substation areas for augmentation of existing substations. In average total 0.40-0.50 acres land will be required for each new substation construction. According to the field survey and received data from PBS, it is anticipated that BREB always intend to purchase land from landowner through “Willing Buyer Willing Selling Approach” where two parties are benefited. Out of 84 new substations, most of the substation’s land will be purchased through willing buy and sell.

123. Another project component is that underground cable installation only applies to cables within the indoor S/S for internal connection. These are not underground distribution lines spanning kilometers across roads, private or public land.

3. Power Requirement

124. Power for construction work will be sourced from existing substations. Diesel generator set may also be used as backup power supply during construction phase of the project.

4. Material

125. BREB uses ordinary machinery for construction works such as forklifts, backhoe, tower cranes, roller, compactors, dump trucks, etc. and ordinary construction tools such as shovel, axe, saw, hammer, wire grip, four-wheel or chain wrist safety gears, conductor stringing equipment, etc. As well as BREB mainly sourced this earth, gravel etc from locally.

126. The main materials specified for the Project are as follows:

- Line Hardware

- Insulator
- Conductor & wire (Bare & others)
- Conductor & wire (Insulated & others)
- Conductor & wire (Underground cable)
- Conductor & Guy Accessories
- Distribution Transformer
- Sectionalizing devices
- Fuse Links
- Connector
- Guy & grounding wire
- 1-P Electronic Meter
- Power Transformer
- 11 kV ACR
- CT/ PT
- 33 kV VCB with CT/PT & control Cable
- SPC Poles
- Wooden Pole
- Cross-arm
- Anchor log
- Substation Switch
- Copper Conductor
- Post Insulator
- Substation steel cross-arm
- Substation Hardware & connector

5. Dredge Material

127. BREB has no plan to use dredged materials as Dredged materials can vary significantly in composition, with some containing contaminants like heavy metals or organic matter. These contaminants could pose environmental risks or corrosion issues for substation equipment. In addition, Substation construction requires predictable and consistent material properties to ensure structural integrity. Dredged materials can be inconsistent, making it difficult to achieve the necessary level of control.

I. SCHEDULE OF IMPLEMENTATION

128. The tentative commencement date of the project is 1st July 2023, and the date of completion is 30 June 2028.

129. BREB pre-construction activities are a) land purchase, b) Soil test, c) water test, d) Noise level and e) air quality test, etc. These activities require around 06 months before starting the construction. Some construction activities of BREB are a) Site clearance, b) land development c) material test d) civil and electrical works, etc. These activities require around 12 months for the construction of each substation and 08 month for the distribution line. The implementation timeline for this project is estimated 05 years.

J. CAPITAL COST OF THE PROJECT

130. BREB was not directly involved in cost estimation, precisely in each item of the project. It collected capital cost data from various documents and reports provided by BREB. However, we have reviewed some of the major cost items and found a few anomalies and revised the cost estimate accordingly. In carrying out financial analysis of the project, we mostly relied on secondary data provided by BREB. Collecting the data and information from the documents, total cost of the project is estimated, which is summarized below:

Table III-15: Estimated Cost of the project (Taka in Lac)

Sector	COST (Taka in lac)
GOB	98,985.14
P.A. (AIIB)	363,999.92
Own Fund	92,368.29
Others	0.00
Total	555,353.35

131. BREB has also emphasizes the allocation of specific funds for climate resilience structures. The detailed cost estimate for climate resilience structures has been given in the following table.

132. In accordance with climate vulnerability specific funds for climate resilience are allocated. The details breakdown of these cost is given below.

Table III-16: Estimated Cost of the project (Taka in Lac)

Item	Quantity	Cost (MUSD)	Cost (Lac BDT)
Rehabilitation of Electric Line in the flood prone areas	314 km	1.22	1327.07
Use of higher size conductor (#477 to #636 mcm) in the 33 kV new & up-gradation line to reduce system loss at the extreme heat	9861 km	9.28	10104.31
Use of Shield wire (D-2 instead of D1) although in the 33 kV new & up-gradation to protect from lightning	3271 km	0.90	981.28
Increase of FGL for substations	84 nos	0.36	390.77
Use of additional pole to reduce the span length building robust network against cyclone/ storm	19597 km	16.83	18317.96
Others material (Hardware, insulator, x-arm, anchor log etc. except conductor) which is related to the additional pole use	19597 km	23.98	26102.04
Increase of installation cost for additional materials	19597 km	23.77	25867.40
Total (This fund is about 17% of total project cost.)		**76.34**	**83090.84**

IV. BASELINE ENVIRONMENTAL AND SOCIAL DATA

A. GENERAL

133. In identifying, predicting, and evaluating impacts, it is necessary to establish a baseline of environmental quality in the area of the project's site. For many components of the environment, the baseline environmental quality is assessed by conducting field investigations within an impact zone. The environmental assessment was based on findings from public consultations and several focus group discussions (FGDs), secondary data from sources such as BBS 2011. Public consultation was held to discuss issues and concerns related to the environment and socio-economy. Social-survey and disclosure was conducted to carry out information on environmental and social risks and impacts of Projects.

134. For macro-environmental conditions like climate (temperature, rainfall, humidity, and wind speed), physiography, geology, etc., data were obtained mostly from secondary sources. During the feasibility study, only a limited amount of first-hand information was collected in order to document the micro-environmental characteristics inside and adjacent to the project corridors.

135. Most of the proposed substation's land has been finalized but not purchased yet. The proposed distribution route is not also fixed as per project scope, and significant amount of distribution line will be upgraded. Nevertheless, the lines will mostly be located in barren land or agricultural land, thus the SS and distribution lines will not fall within any restricted areas.

136. Given the nature and footprint of the project operations, the project's area of influence is defined as a radius of 1 km around substations and 500 m of alignments along the distribution line. The right of way along a distribution line is considered the area of direct effect. However, in terms of indirect effects on ecologically sensitive places, such as national protected area networks, the possible impact zone of substations and distribution line alignments is assessed up to a radius of 5 km. Based on these considerations and the available design data, the environmental & social baseline data have been collected.

137. The following section describes the baseline environment in three broad categories:

- **Physical Environment-** factors such climate, geology and hydrology.
- **Biological Environment-** factors related to life such as flora, fauna and ecosystem; and
- **Socio-economic Environment-** anthropological factors like demography, income, land use and infrastructure.

B. RAJSHAHI DIVISION

1. Physical Environment

a) Climate

138. According to the classification, the Rajshahi division is located in the western region and Southwestern climatic zone (Figure IV.1). Western zone comprises the greater Rajshahi district and parts of adjacent districts. This is the driest area in Bangladesh with rainfall generally below 1,500 mm and summer humidity less than 50%. In summer, it is the hottest and driest of all climatic zones. Mean summer maximum temperature is over 35°C. Except that the extremes in the Northwestern part are less and the rainfall is lower, this zone is similar to the northern part of the northern region. The lower rainfall makes this area both atmospherically and pedologically drier (Banglapedia, 2015).

139. The climatic condition of the whole project area may be considered same as reported as per Bogra, Ishwardi, and Rajshahi, stations of Bangladesh Meteorological Department

(BMD) since these stations are within the project areas. The climatic diagrams are based on 30 years of weather model simulations. The weather models with historical data from 1989 to 2019 onwards and generated a continuous 30-year global history with hourly weather data.

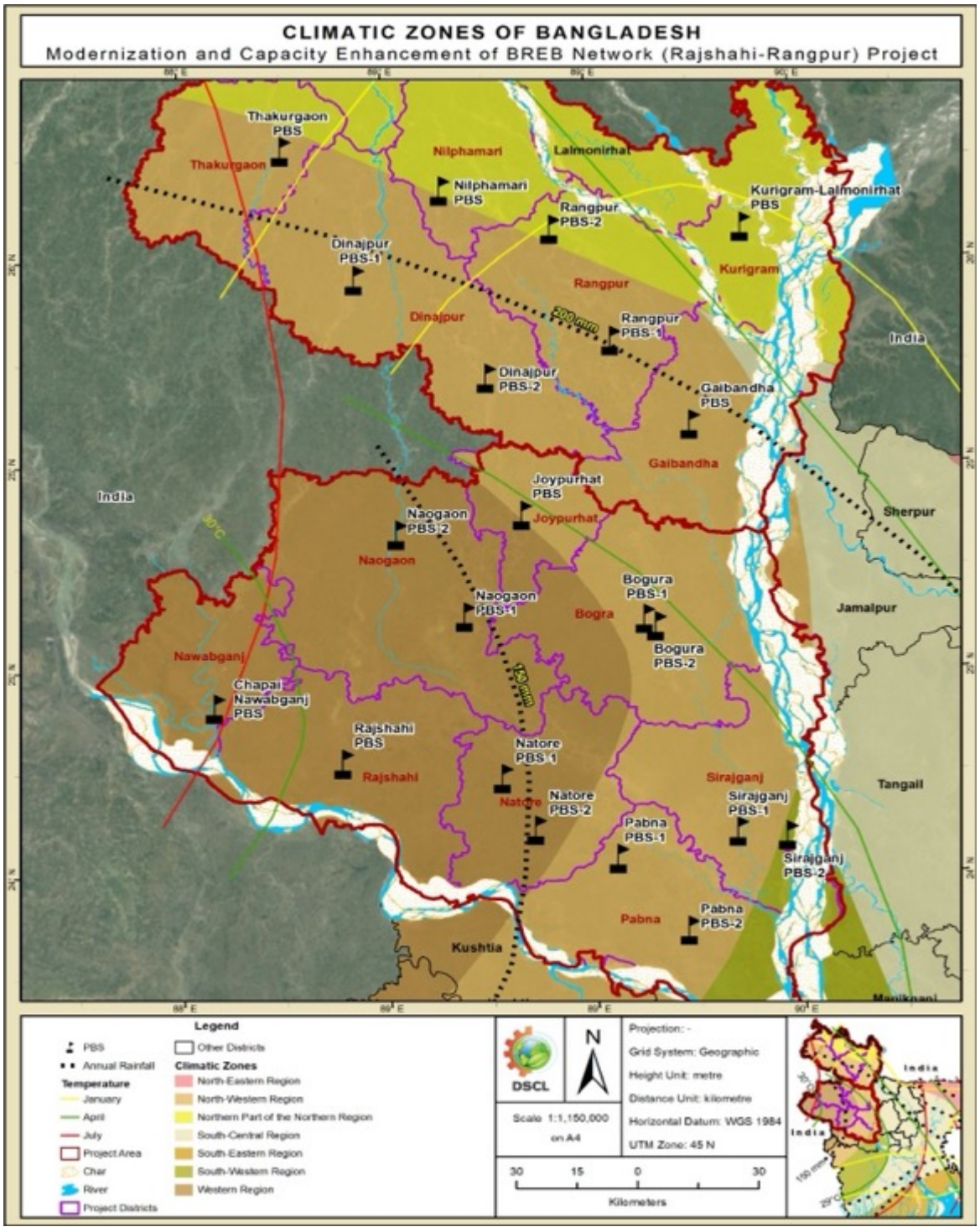
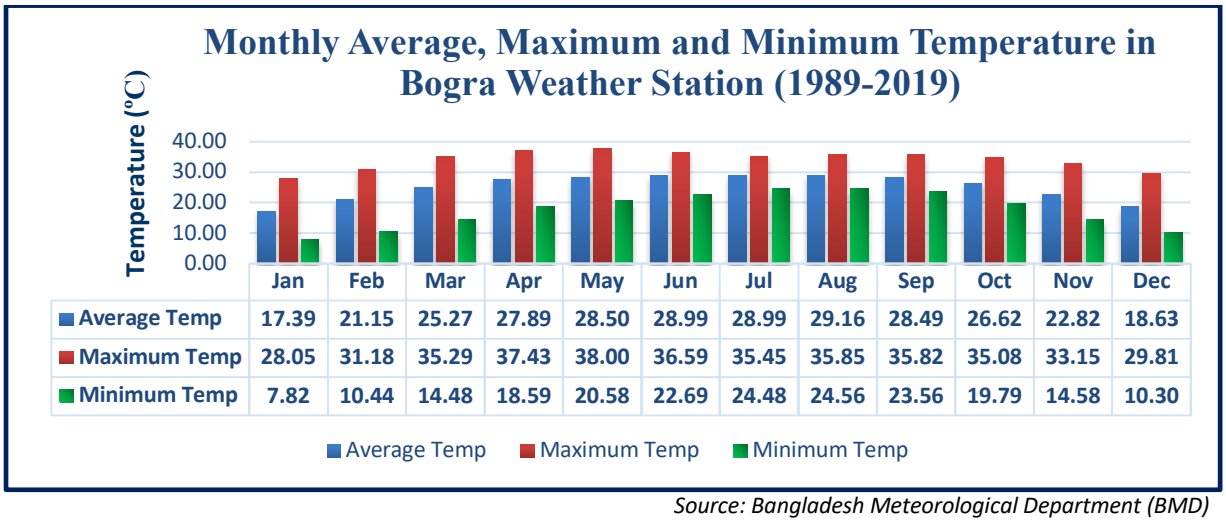


Figure IV.1: Climate Zone of study area

(iii) Temperature

140. Rajshahi has a tropical wet and dry climate. The climate of Rajshahi is generally marked with monsoons, high temperature, considerable humidity, and moderate rainfall. The hot season commences early in March and continues till the middle of July. The maximum temperature observed is about 35 to 40 °C during the months of April, May, June and July and the minimum temperature recorded in January is about 6 to 8 °C. Figure IV.2 to IV.4 shows the details of the temperature pattern in the project areas.

141. At the Bogra weather station of the Bangladesh Meteorological Department, monthly average temperatures were gathered from 1989 to 2019. From the figure IV.2, the highest average recorded temperature was 38°C in May. The lowest average recorded temperature was found in the month of January which was 7.82°C.

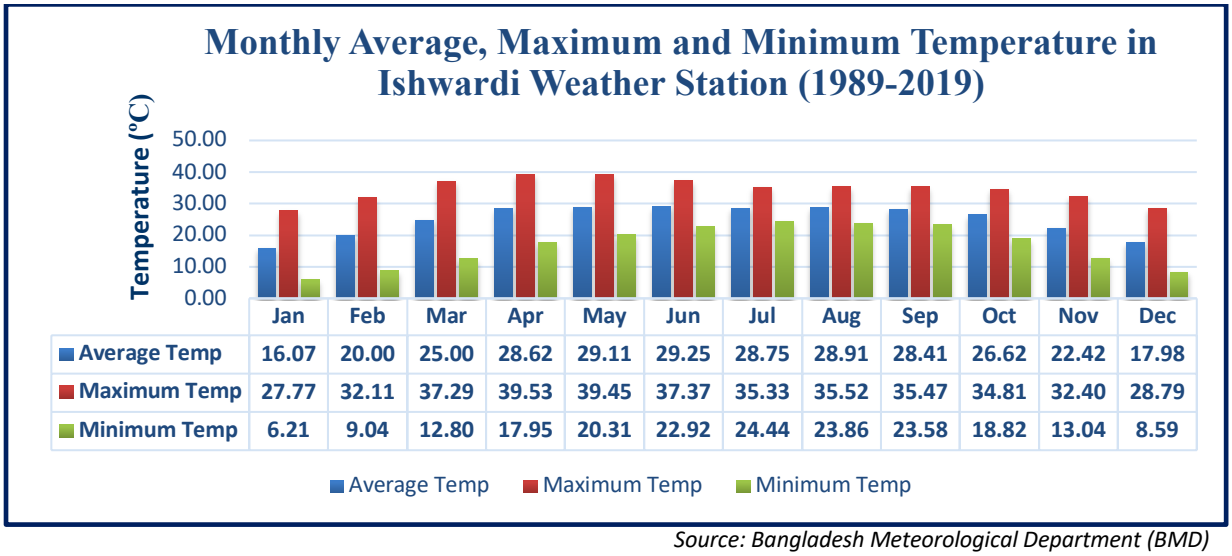


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Temp	17.39	21.15	25.27	27.89	28.50	28.99	28.99	29.16	28.49	26.62	22.82	18.63
Maximum Temp	28.05	31.18	35.29	37.43	38.00	36.59	35.45	35.85	35.82	35.08	33.15	29.81
Minimum Temp	7.82	10.44	14.48	18.59	20.58	22.69	24.48	24.56	23.56	19.79	14.58	10.30

Source: Bangladesh Meteorological Department (BMD)

Figure IV.2: Monthly Average, Maximum and Minimum Temperature of Bogra Weather Station

142. At the Ishwardi weather station of the Bangladesh Meteorological Department, monthly average temperatures were gathered from 1989 to 2019. From the figure IV.3, the highest average recorded temperature was around 39.5°C in April-May. The lowest average recorded temperature was found in the month of January, which was 6.21°C.

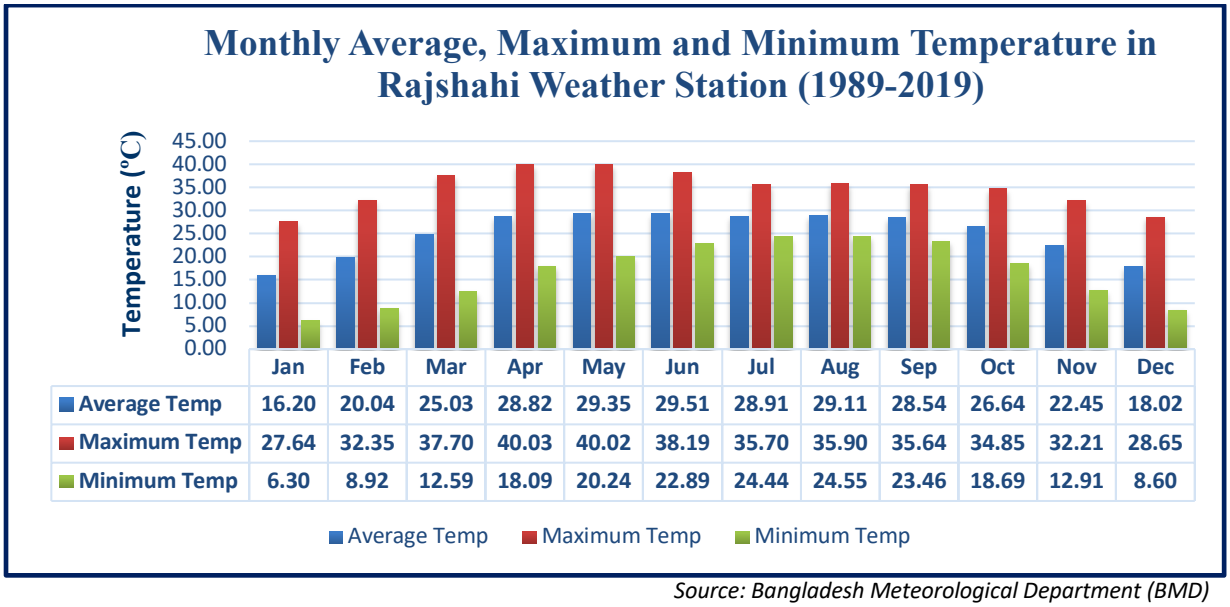


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Temp	16.07	20.00	25.00	28.62	29.11	29.25	28.75	28.91	28.41	26.62	22.42	17.98
Maximum Temp	27.77	32.11	37.29	39.53	39.45	37.37	35.33	35.52	35.47	34.81	32.40	28.79
Minimum Temp	6.21	9.04	12.80	17.95	20.31	22.92	24.44	23.86	23.58	18.82	13.04	8.59

Source: Bangladesh Meteorological Department (BMD)

Figure IV.3: Monthly Average, Maximum and Minimum Temperature of Ishwardi Weather Station

143. At the Rajshahi weather station of the Bangladesh Meteorological Department, monthly average temperatures were gathered from 1989 to 2019. From the figure IV.4, the highest average recorded temperature was near 40°C in April-May. The lowest average recorded temperature was found in the month of January, which was 6.30°C.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Temp	16.20	20.04	25.03	28.82	29.35	29.51	28.91	29.11	28.54	26.64	22.45	18.02
Maximum Temp	27.64	32.35	37.70	40.03	40.02	38.19	35.70	35.90	35.64	34.85	32.21	28.65
Minimum Temp	6.30	8.92	12.59	18.09	20.24	22.89	24.44	24.55	23.46	18.69	12.91	8.60

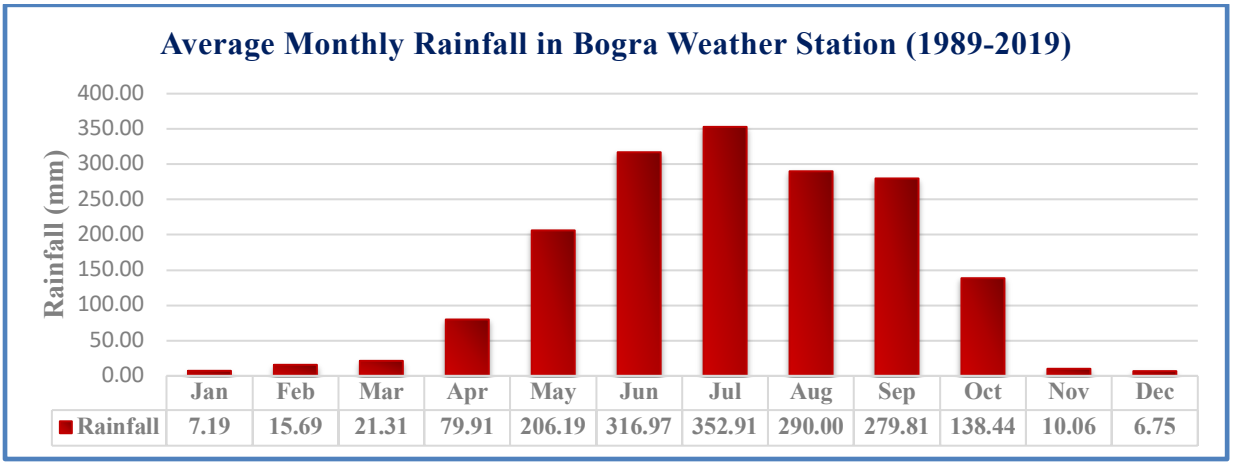
Source: Bangladesh Meteorological Department (BMD)

Figure IV.4 Monthly Average, Maximum and Minimum Temperature of Rajshahi Weather Station

(iv) Rainfall

144. Rainfall is the most dominant climatic element. Heavy rainfall is characteristic of Bangladesh frequently causing floods across the country or at a local scale. With the exception of the relatively dry western region of Rajshahi, where the annual rainfall is about 1,600 mm (63.0 in), most parts of the country receive at least 2,300 mm (90.6 in) of rainfall per year. About 80% of Bangladesh's rain falls during the monsoon season. Seasonal results are based on monthly analysis. In the context of monthly variation, for all of the three weather stations, July is the highest month of rainfall while December is the lowest one.

145. The rainfall data obtained from the Bogra weather station shows that the highest rainfall occurs in July and the lowest rainfall occurs in December to January during winter season. From the figure IV.5, the highest average recorded rainfall was near 353 mm in July. The lowest average recorded rainfall was found in the month of December which was 6.75 mm.



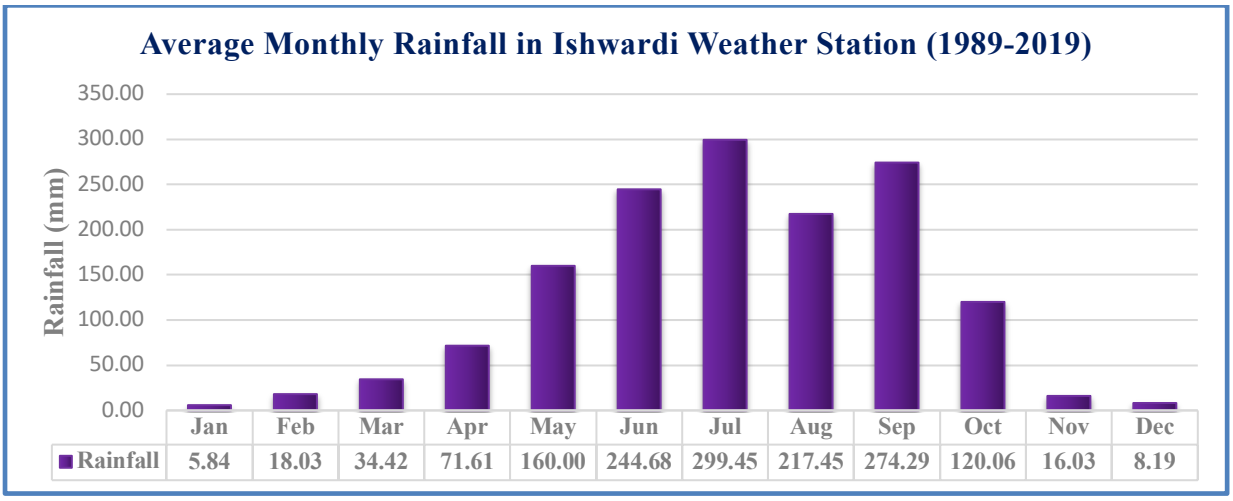
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall	7.19	15.69	21.31	79.91	206.19	316.97	352.91	290.00	279.81	138.44	10.06	6.75

Source: Bangladesh Meteorological Department (BMD)

Figure IV.5: Average Monthly Rainfall of Bogra Weather Station

146. The rainfall data obtained from the Ishwardi weather station shows that the highest rainfall occurs in July and the lowest rainfall occurs in December to January during winter season. From the figure IV.6, the highest average recorded rainfall was near 300 mm in July.

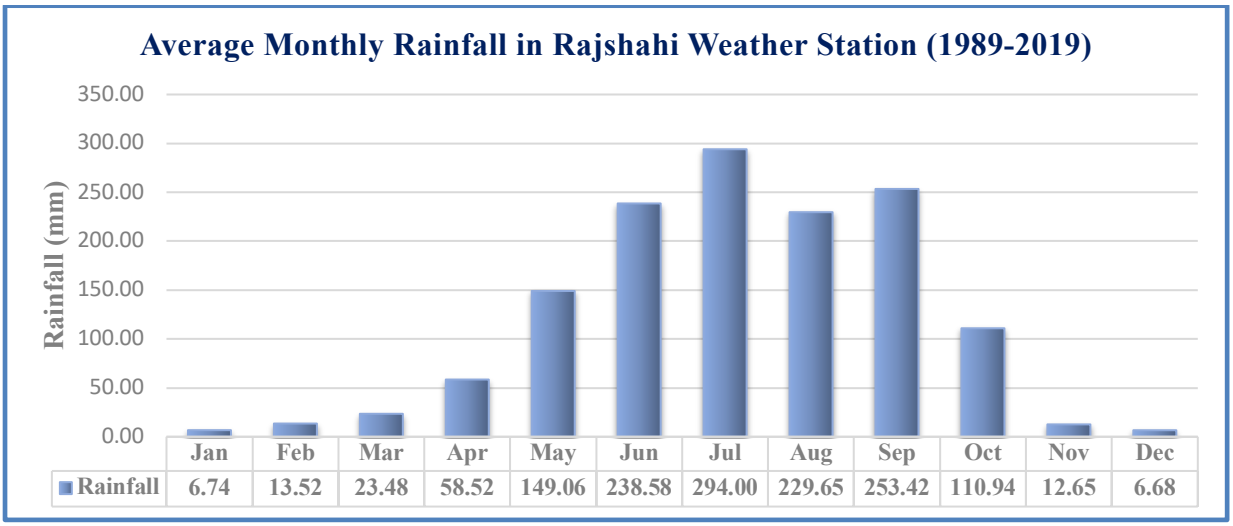
The lowest average recorded rainfall was found in the month of December which was 5.84 mm.



Source: Bangladesh Meteorological Department (BMD)

Figure IV.6: Average Monthly Rainfall of Ishwardi Weather Station

147. The rainfall data obtained from the Rajshahi weather station shows that the highest rainfall occurs in July and the lowest rainfall occurs in December to January during winter season. From the figure IV.7, the highest average recorded rainfall was near 294 mm in July. The lowest average recorded rainfall was found in the month of December which was 6.58 mm.

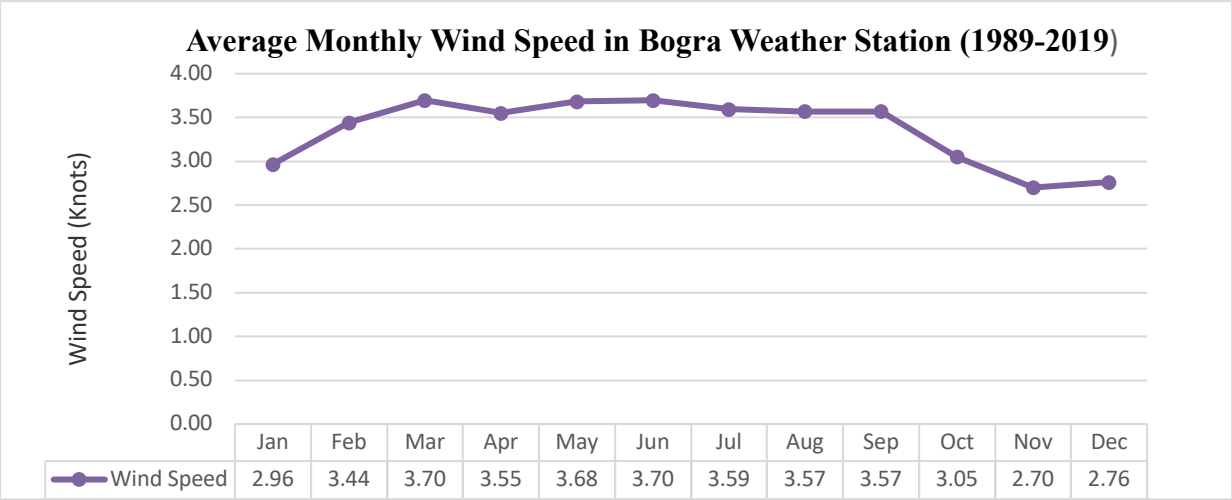


Source: Bangladesh Meteorological Department (BMD)

Figure IV.7: Average Monthly Rainfall of Rajshahi Weather Station

(v) Wind Speed and Direction

148. Wind speed data across the project area show different scenarios. Wind speed varies from location to location and is also dependent on the time of year. The windiest months of the year tend to be during the pre-monsoon period. Wind speeds stay high during the summer monsoon but gradually decrease until November which is usually the calmest month in the project area. For all of the three weather stations, figure IV.8 to IV.13 shows the days per month, during which the wind reaches a certain speed. where the monsoon creates steady strong winds from December to April, and calm winds from June to October.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind Speed	2.96	3.44	3.70	3.55	3.68	3.70	3.59	3.57	3.57	3.05	2.70	2.76

Source: Bangladesh Meteorological Department (BMD)

Figure IV.8: Average Monthly Wind Speed of Bogra Weather Station

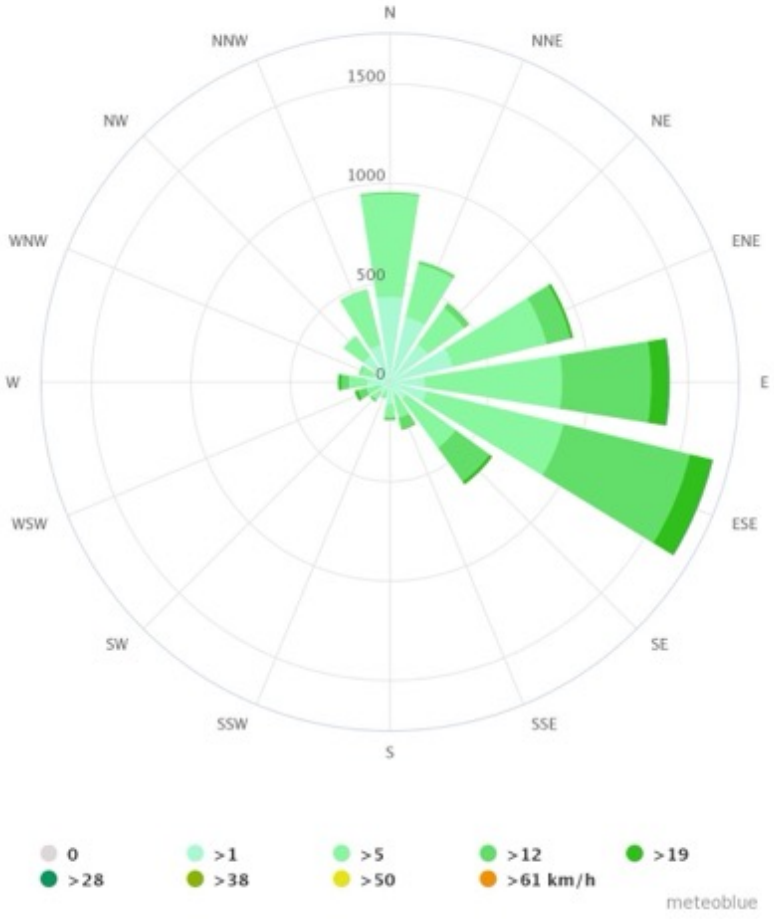
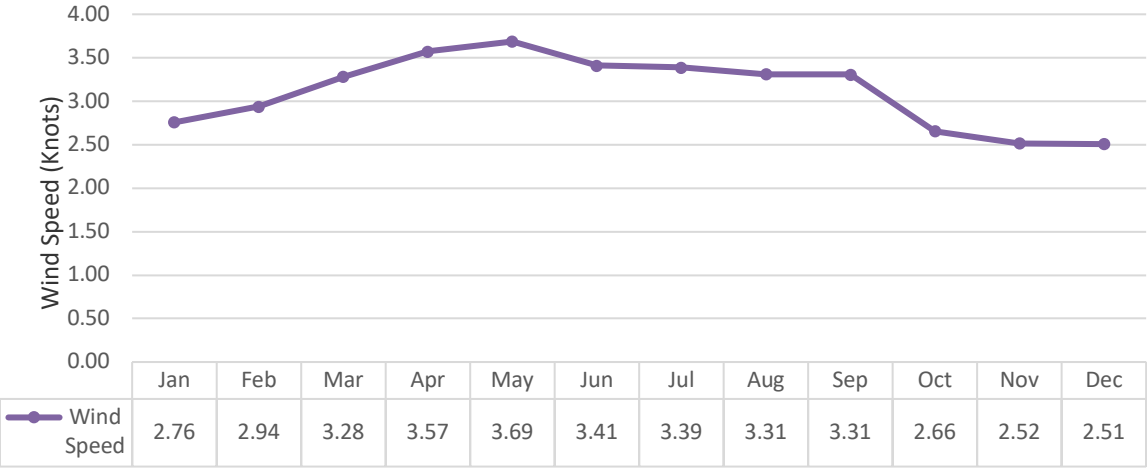


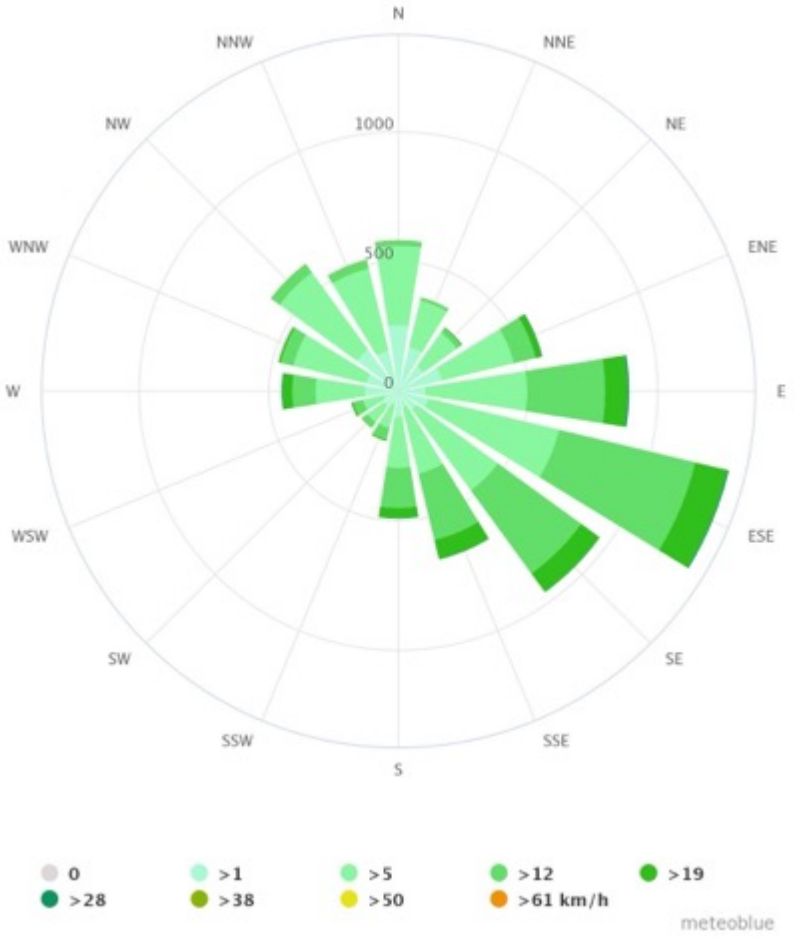
Figure IV.9: Wind rose diagram of Bogra Weather Station



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind Speed	2.76	2.94	3.28	3.57	3.69	3.41	3.39	3.31	3.31	2.66	2.52	2.51

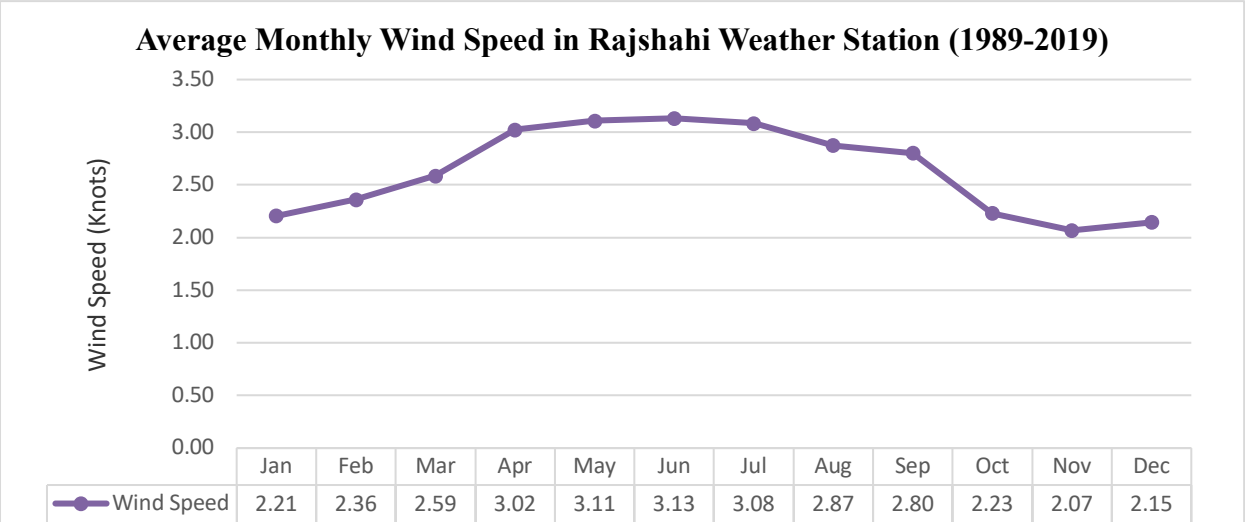
Source: Bangladesh Meteorological Department (BMD)

Figure IV.10: Average Monthly Wind Speed of Ishwardi Weather Station



(Source: Meteoblue)

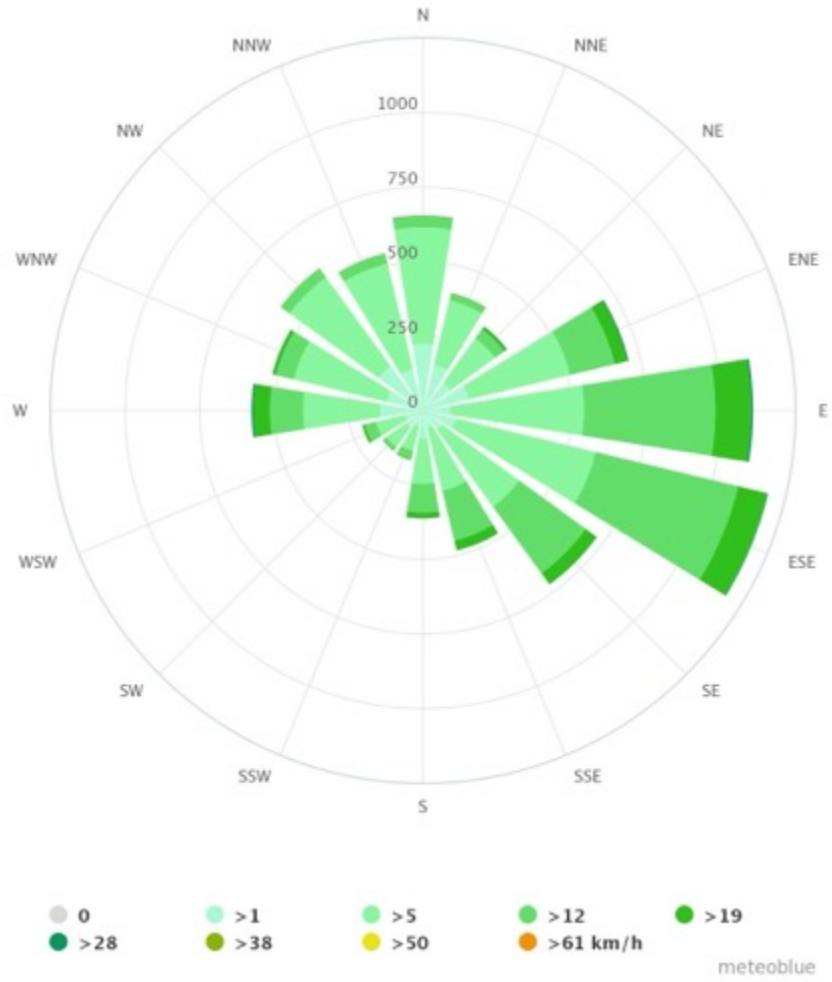
Figure IV.11: Wind rose diagram of Ishwardi Weather Station



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind Speed	2.21	2.36	2.59	3.02	3.11	3.13	3.08	2.87	2.80	2.23	2.07	2.15

Source: Bangladesh Meteorological Department (BMD)

Figure IV.12: Average Monthly Wind Speed of Rajshahi Weather Station

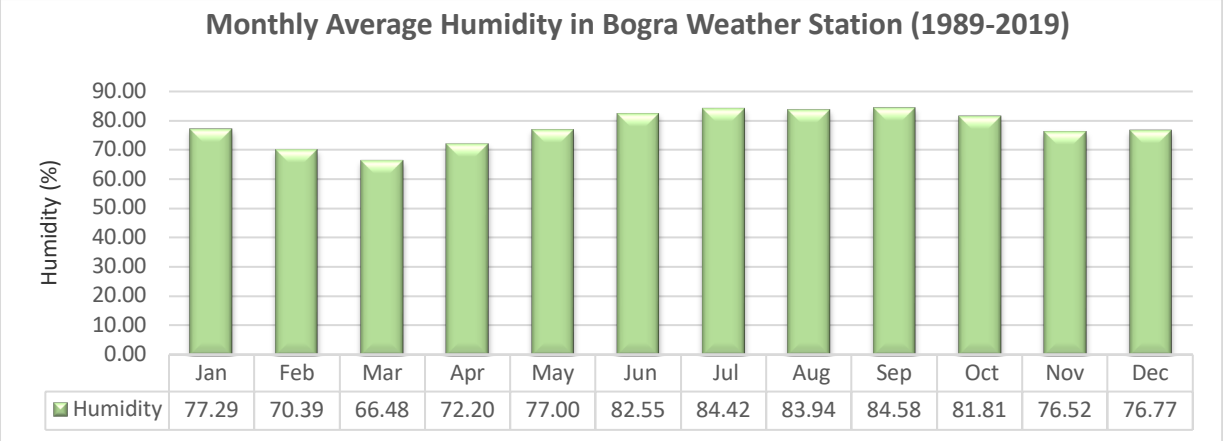


(Source: Meteoblue)

Figure IV.13: Wind Rose diagram of Rajshahi Weather Station

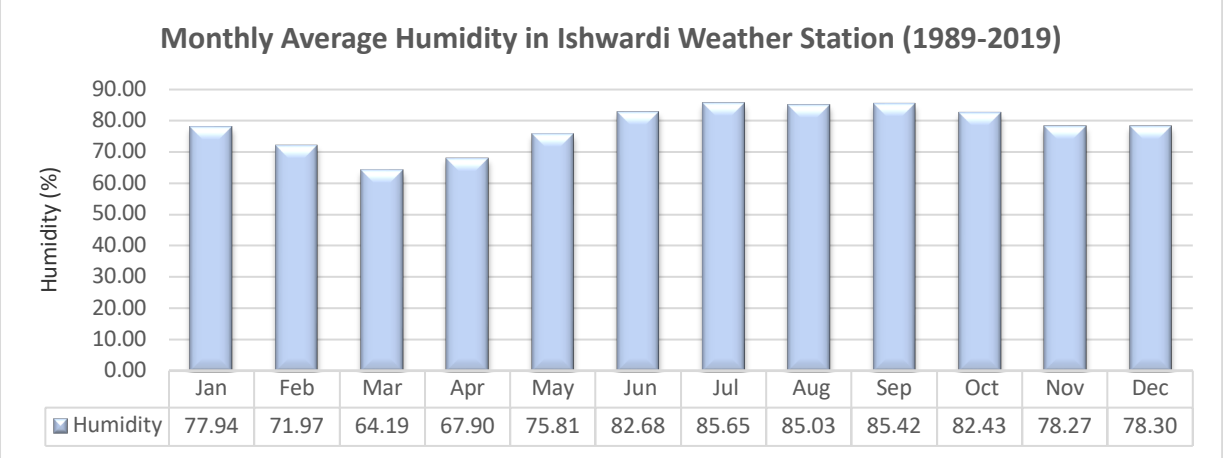
(vi)Relative Humidity

149. Humidity across the general project area shows similar variation during the year with the highest readings between June and October (figures IV.14-IV.16) in the height of monsoon rains. Humidity is highest at Rajshahi experience 86.58% in July. The lowest recorded average monthly humidity 64.19% in March at Ishwardi.



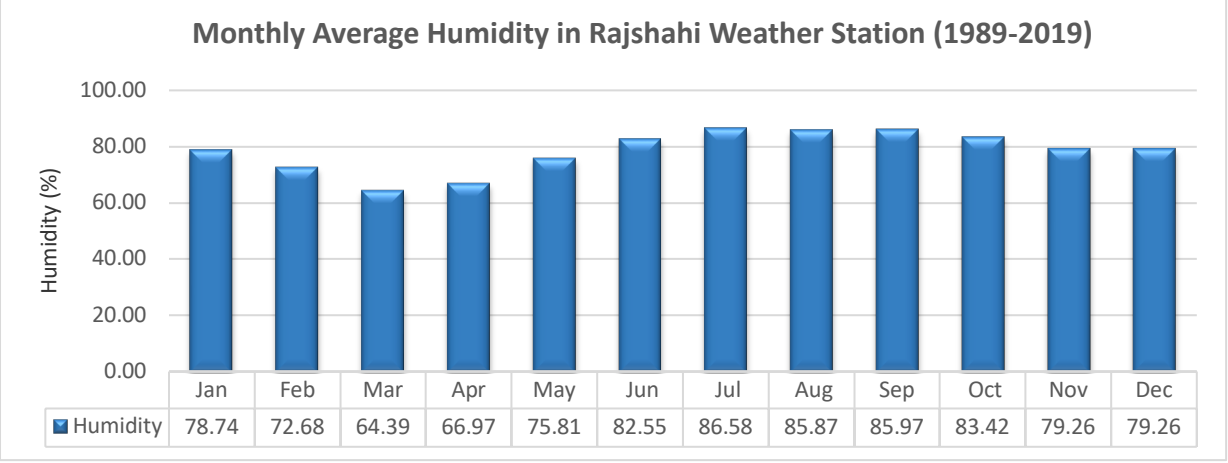
Source: Bangladesh Meteorological Department (BMD)

Figure IV.14: Average Monthly Relative Humidity of Bogra Weather Station



Source: Bangladesh Meteorological Department (BMD)

Figure IV.15: Average Monthly Relative Humidity of Ishwardi Weather Station



Source: Bangladesh Meteorological Department (BMD)

Figure IV.16: Average Monthly Relative Humidity of Rajshahi Weather Station

b) Topography

150. Topography is the configuration of a land surface including its relief and contours, the distribution of mountains and valleys, the patterns of rivers, and all other features, natural and artificial, that produce the landscape. Although Bangladesh is a small country, it has considerable topographic diversity. It has three distinctive features: (i) a broad alluvial plain subject to frequent flooding, (ii) a slightly elevated relatively older plain, and (iii) a small hill region drained by flashy rivers. The general topography of the project area slopes from north to south with elevation ranged from 10m a.m.s.l to 75m a.m.s.l. At the very north-west point Naogaon and Chapainawabganj district are lying, and the elevation is 30m a.m.s.l to 75m a.m.s.l and in Bogra the elevation is 10m a.m.s.l to 35m a.m.s.l.

c) Physiographic Features

151. The proposed project areas lie mostly in the north-western part of the country and depend on the Ganges River for freshwater supply. The Rajshahi division as well as the subprojects in this division comprises the following major physiographic units (Figure IV.17).

152. In the time of small-scale mapping, the Mahananda floodplain in the northwest and some detached areas of the Old Meghna estuarine floodplain in the southeast used to be included within this unit.

153. The southern part of the main eastern bloc of the Barind Tract is tilted down towards the southwest and passes under lower Atrai basin sediments in the south. The Barind Tract covers most parts of the greater Dinajpur, Rangpur, Pabna, Rajshahi, Bogra, Joypurhat, and Naogaon districts of the Rajshahi division.

154. The diversity results from the fact that the tista floodplain has occupied and abandoned several different channels during the past few thousand years including the valleys now occupied by Mahananda, Punarbhaba, Atrai, little Jamuna, Karatoya, and Ghaghat rivers. The small floodplains of Dudhkumar and Gangadhar Rivers are also included in this unit. The main geomorphic agent of this unit is the river, Tista. This river along with the others brings sediments of different sizes to the floodplain at different times.

155. The construction of polder projects since the 1960s has improved drainage to some extent. However, deep flooding can still occur within polders as well as outside when there is heavy rainfall locally and when flash floods flow down the Atrai or off the adjoining Barind Tract, causing natural or man-made breaches of embankments.

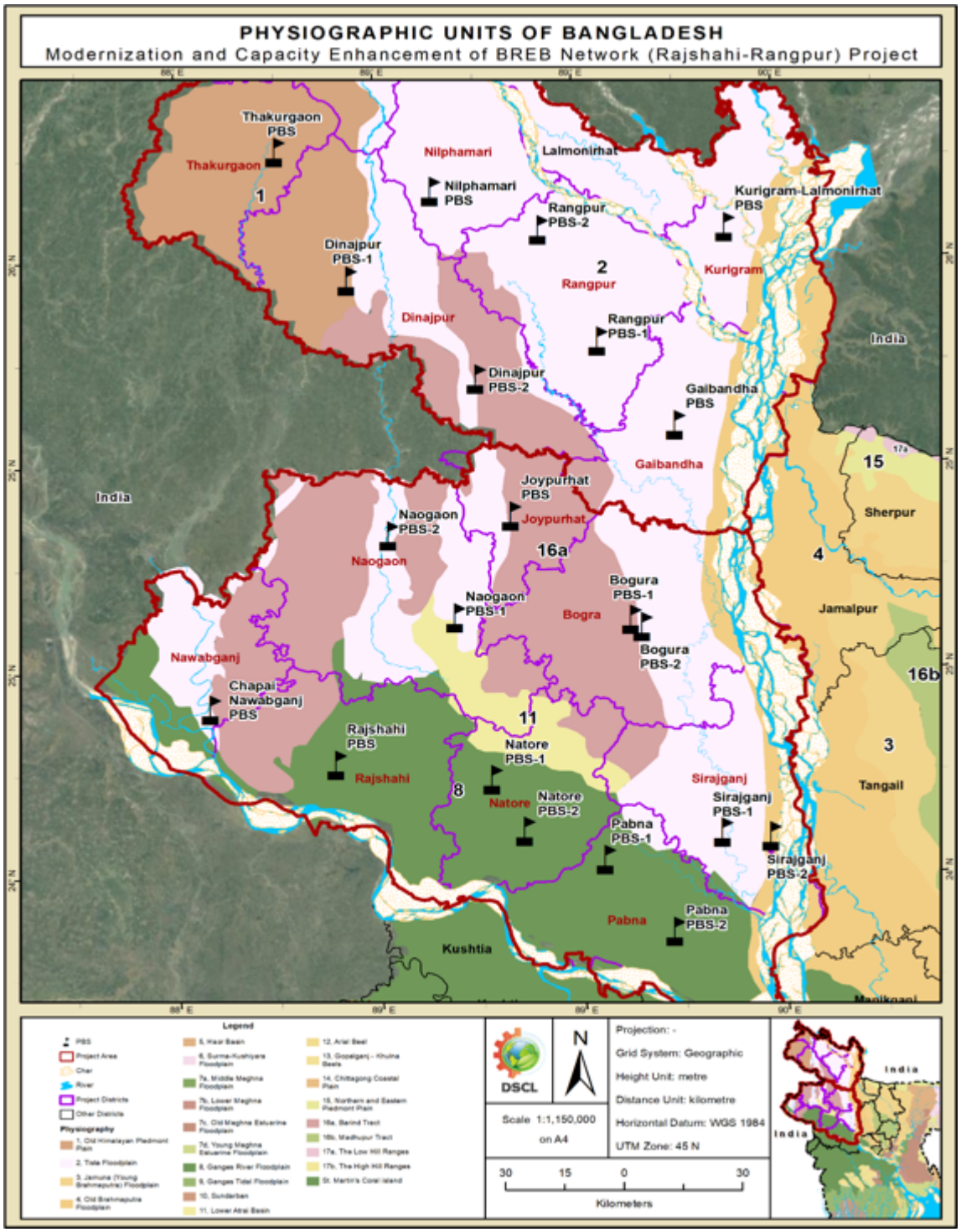


Figure IV.17: Physiographic map of study area

d) Geology

156. The stable Precambrian platform occupies mostly Rajshahi areas and is characterized by limited to moderate thickness of sedimentary rocks above a Precambrian igneous and metamorphic basement. This unit is geologically stable in relative terms and has not been affected by fold movement. Some fault bounded graben basins occur within the Precambrian Basement. These basins contain coal-bearing rock units of the Permian Period (286 to 245 million years ago), the oldest sedimentary rock found in Bangladesh. The Precambrian platform is divided into a northern Rangpur Saddle with a very shallow Precambrian basement (130 to 1,000m) and a southern Bogra Shelf with a basement at moderate depth (1 to 6 km). Sedimentary layers in the Bogra shelf dip very gently towards the southeast until it reaches

the hinge zone when the dip suddenly increases to 15 to 20 degrees and the sedimentary units plunge to a great depth into the deep geosynclinal basin to the southeast. The detailed geologic patterns are shown in Figure IV.18.

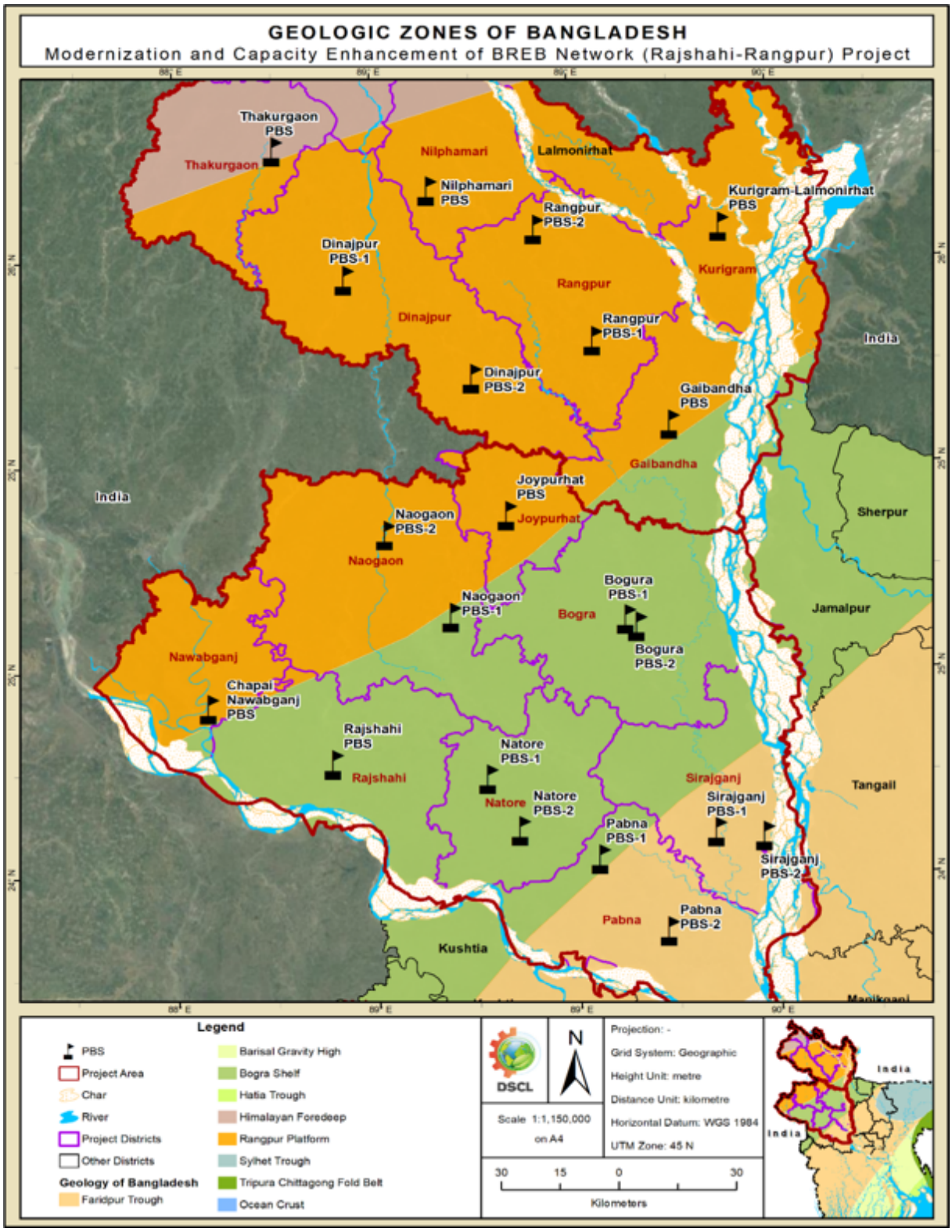


Figure IV.18: Physiographic map of study area

e) Soil

157. The Rajshahi division falls twelve different soil formation zones (Figure IV.19). The general soil types of the Rajshahi division predominantly include the following Acid Basin Clay occur mainly in the haor basin and more clearly in the Eastern Surma-Kushiyara floodplain, the lower Atrai Basin, Barind tract, Madhupur tract, and Brahmaputra and Ganges floodplains. Calcareous Dark Grey & Brown Floodplain soils where Soils of this group mainly occur on the Ganges tidal floodplain in the southwest, also minor areas on the river floodplain of the Ganges and Lower Meghna.

158. Deep Red Brown Terrace Soils occur extensively in the northeastern Barind Tract, on the Madhupur Tract, and the Akhaura Terrace.

159. Non-calcareous Alluvium soil occupies extensive areas on the active Tista and Brahmaputra-Jamuna floodplains. They are sandy or silty, grey or olive, neutral to slightly alkaline.

160. Non-calcareous Grey Floodplain Soils: Generally, comprise a grey topsoil and a cambic B-horizon in the subsoil with a grey matrix or grey gleans. They extensively occupy Tista, Karatoya-Bangali, Jamuna, middle Meghna and eastern Surma-Kushiyara floodplains.

161. Non-calcareous Dark Grey & Grey Floodplain Soils occur extensively on the Old Brahmaputra and old Meghna estuarine floodplain. Silt loam and silty clay loam are predominant on the Meghna estuarine floodplain and in the Tista meander floodplain, whereas silty clays.

162. Deep & Shallow Grey Terrace Soils: Shallow grey terrace soils occur extensively on the level Barind Tract and the high Barind Tract. The soils are grey, silty, and poorly drained, which overlie heavy, grey, little-altered Madhupur Clay at a shallow depth.

163. Calcareous Dark Grey & Brown Floodplain Soils: Occur extensively on the Ganges floodplain and locally on the soils that comprise cambic B-horizon and lime in part or throughout the solum and with dark grey topsoil and/or upper subsoil.

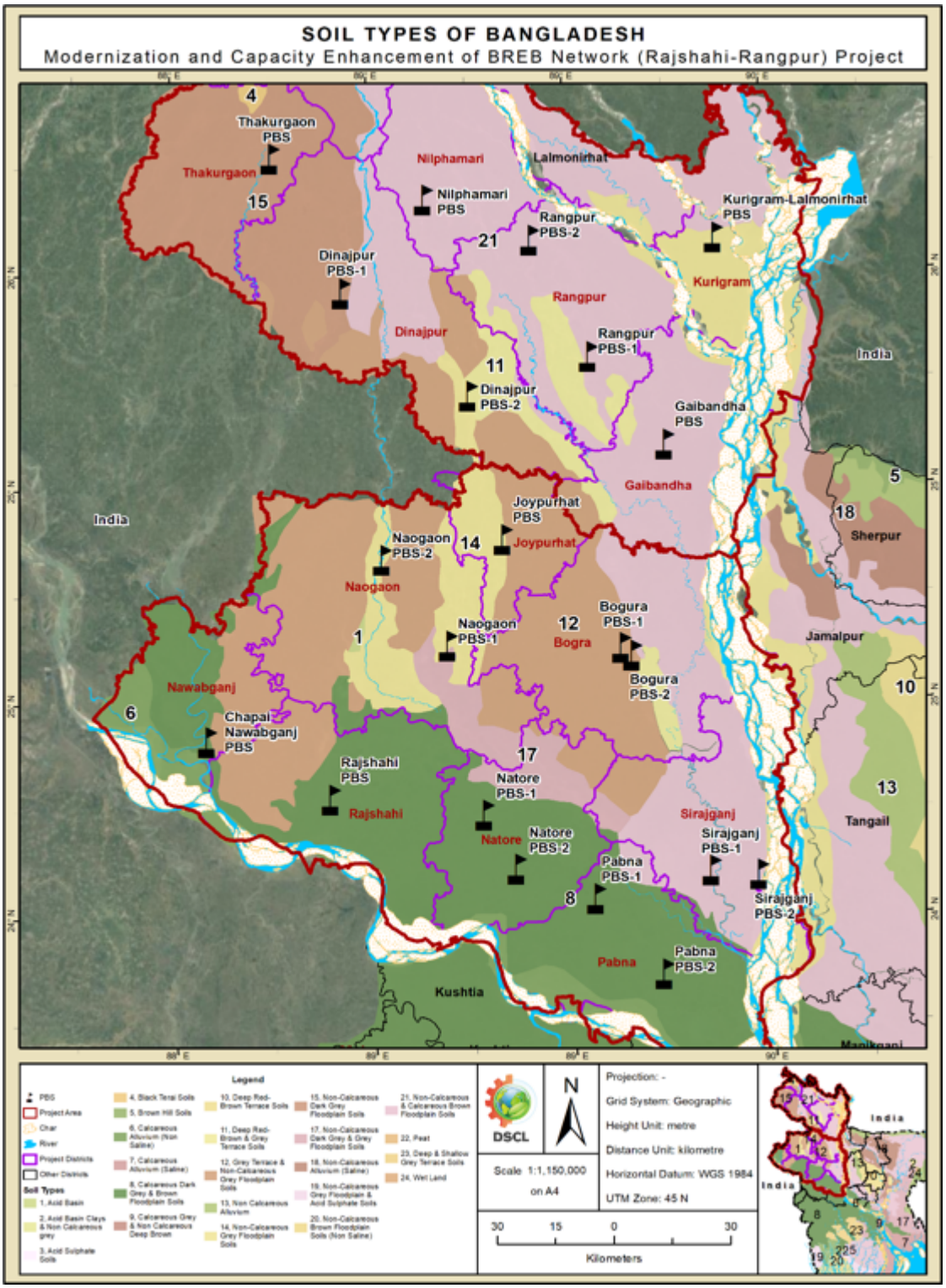


Figure IV.19: Soil Map of the study area

f) Ambient Air Quality

164. Ambient air quality monitoring at the subproject sites was measured to verify the baseline quality of air as per DoE and international standards & the digital equipment's were used for air quality monitoring. Dispersal of pollutants depends upon factors like atmospheric stability, the height of the source, prevailing wind direction and other weather conditions. The air quality was done in 2021 as per geographical condition of the sites. In addition, most of the substation sites were not finalized in 2021. So, the testing was performed at three (03) project locations in Rajshahi division from 26 October 2021 to 08 November 2021 (see Figure IV.20).

The monitored parameters were CO, O_3, NO_X, SO_2, $PM_{2.5}$ and PM_{10}. Oceanus Portable Gas Detector OC-905 was used to measure SO2, NOX, and CO. Oceanus Portable Gas Detector OC-300 measured PM2.5 & PM10 of gaseous pollutant. The weather was mostly sunny during the monitoring period. Proper Personal Protective Equipment (PPE) was used during the monitoring period. All the locations of sample collections are summarized in Table IV 1. Electro-Chemical Sensor devices were calibrated before testing the relevant parameters. Results of the air quality monitoring at the subproject locations have been shown in Table IV 1. The sample site descriptions are provided in Table IV-2. The laboratory test result is given in Appendix 2 of the report.

Vill: Khottapara; Upz:Shahjahnpur; Dist: Bogra
Bogra PBS-2

Vill: Alipur; Upz:Gurudaspur; Dist: Natore
Natore PBS-2

Vill: Goborchapa, Sagorpur; Upz:Bodolgachi; Dist: Naogaon
Naogaon PBS-1

Figure IV.20: Ambient Air Quality Sampling in the Project Area

Table IV-1: Test Result of Ambient Air Quality Analysis

Location	GPS Location	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	NO_x (µg/m³)	SO_2 (µg/m³)	CO (ppm)	O_3 (µg/m³)
		AEROQUAL Series 500 Particulate matter monitors		AEROQUAL Series 500 NOx monitor	AEROQUAL Series 500 SOx monitor	CO Meter	O_3 Meter
Khuttapara, Shahjahanpur, Bogra	N-24.787325° E 89.404508°	33.78	37.23	13.96	3.78	0.23	7.56
Sagorpur, Goborchapa, Beside Anowar Brick Field, Naogaon	N-25.002121° E-88.959550°	80.36	61.72	21.23	24.76	1.78	10.93
Alipur, Gurdaspur, Natore	N-24.344171° E-89.104993°	47.53	39.15	4.38	9.53	0.46	6.47
Weather Condition	Mostly Sunny						

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Location	GPS Location	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_x ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (ppm)	O_3 ($\mu g/m^3$)
		AEROQUAL Series 500 Particulate matter monitors		AEROQUAL Series 500 NOx monitor	AEROQUAL Series 500 SOx monitor	CO Meter	O_3 Meter
Standard for Ambient Air Quality according to DoE, Bangladesh		150	65	100	365	9	157
Standard for Ambient Air Quality according to WHO guidelines, 2022		-	-	-	500	10	100

Table IV-2: Description of the surrounding environment

Location	Sample Site Description
Khuttapara, Shahjahanpur, Bogra **(AAQ_01)**	➢ The weather was sunny during the monitoring period. ➢ Visible dust particles were moderate. ➢ Traffic movement was moderate. ➢ People's movement was low. ➢ Moderate level of agricultural land. ➢ No sensitive receptor was found within the 500m buffer zone during our survey.
Sagorpur, Goborchapa, Bodolgachi, Naogaon **(AAQ_05)**	➢ Besides road and brickfield. ➢ The visible dust particle was high. ➢ The weather was sunny during the monitoring period. ➢ People's movement was moderate. ➢ The vehicle movement was comparatively moderate. ➢ No sensitive receptor was found within the 500m buffer zone during our survey.
Alipur, Gurudaspur (Beside Alipur Baitul Anam Jame Mpsque), Bodolgachi, Natore. **(AAQ-06)**	➢ The weather was sunny during the monitoring period. ➢ The visible dust particle was low. ➢ People's movement was low. ➢ Vehicle movement was moderate. ➢ No sensitive receptor was found within the 500m buffer zone during our survey.

165. From the assessment of the ambient air quality of the project area it has been anticipated that all the parameters are within national standard according to the ECR-97

g) Noise Level

166. Excessive noise is a potential issue for both human and biological receivers. It can cause a range of negative points, from mild annoyance and moderately elevated levels of aggression to patterns and temporary or permanent hearing loss in severe cases. Noise Level Measurement was analyzed from project boundaries in Rajshahi division at three (03) specific locations from 26 October 2021 to 08 November 2021 (figure IV.22). Results of the noise level monitored at the sampling locations have been shown in Table IV 3.

Vill: Khottapara; Upz:Shahjahnpur; Dist: Bogra Bogra PBS-2

Vill: Namuri; Upz:Polashi; Dist: Lalmonirhat Kur-Lalmoni PBS

Vill: Goborchapa, Sagorpur; Upz:Bodolgachi; Dist: Naogaon, Naogaon PBS-1

Figure IV.21: Noise Level Measurement in the Project Area

Table IV-3: Results of Noise Level Measurement

Sample ID	Location	GPS Location	Land Use Category	Measurement Time		Noise Level
				Day		Day
				Start	End	
NM_01	Khuttapara, Shahjahanpur, Bogra	N-24.787325° E 89.404508°	Residential	10:10 am	10:40 am	47.56
NM_05	Alipur, Gurdaspur, Natore	N-24.344110° E-89.104993°	Residential	01:25 pm	01:55 pm	51.64
NM_06	Sagorpur, Goborchapa, Noagaon	N-25.002198° E-88.959503°	Residential	01:00 pm	01:30 pm	49.76

Notes

- *Land use category is based on the classification provided in the Noise Pollution Control Rules (2006).*
- *The sound level standard for the Residential area at daytime is 55 dBA, and nighttime is 45 dBA.*
- *The sound level standard for the mixed areas at daytime is 60 dBA and nighttime is 50 dBA.*
- *Noise level is the average noise recorded over the duration of the monitoring period.*
- *According to IFC EHS guidelines, sound level standard for the Residential, institutional, and educational area at daytime is 55 dBA, and nighttime is 45 dBA.*
- *According to IFC EHS guidelines, sound level standard for the industrial and commercial area at daytime is 70 dBA, and nighttime is 70 dBA*

Table IV-4: Description of the surrounding environment

Location	Sample Site Description
Khuttapara, Shahjahanpur, Bogra **(NM_01)**	➢ Traffic movement was moderate. ➢ People's movement was low. ➢ Residential area. ➢ No sensitive receptor was found within the 500m buffer zone during our survey.
Alipur, Gurdaspur, Natore **(NM_05)**	➢ Traffic movement was moderate. ➢ People's movement was moderate. ➢ Residential Area ➢ Beside Road. ➢ No sensitive receptor was found within the 500m buffer zone during our survey.
Sagorpur, Goborchapa, Noagaon **(NM_06)**	➢ Traffic movement was high. ➢ People's movement was moderate. ➢ Residential Area. ➢ No sensitive receptor was found within the 500m buffer zone during our survey.

The result table shows that the time-weighted average value of the sound monitoring in the sampling locations is within the national standard set for residential areas. Noise impacts

should not exceed the levels stated or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site. In general, the noise level limit is represented by the background or ambient noise levels that would be present in the absence of the facility or noise source(s) under investigation (IFC EHS Guidelines 2007.

h) Water Resources and Hydrology

167. Water Resources of Bangladesh is endowed with plenty of surface and groundwater resources. The surface water resources comprise water available from flowing rivers and static water bodies as ponds, beels and haors.

Figure IV.22: Hydrological Network Map of the study area

(i) Surface Water

168. Rajshahi division is in the northwestern part of Bangladesh, which is bounded by the River Padma in the South and the River Jamuna in the East. In Bangladesh there are 1000

main rivers, including three principal rivers (viz. Borak-Meghna, Brahmaputra-Jamuna and Ganga-Padma) and 300 major rivers, having a total length of 24,140 km and total catchment area of river systems is about 1.61 million km2 (Rashid 1991). The River Ganga (Padma) originated from the Gangotri glacial of the Himalayas, flows 2 400 km before entering Rajshahi, Bangladesh. From Rajshahi, it is called Padma, and again flows 112 km to meet the River Meghna at Chandpur (Bangla Academy Science Encyclopedia, BASE 2002). The River Ganga was dammed at Farakka diverting flow to facilitate navigation in the rivers Hugli and Bhagiroti in Kolkata, India. The Farakka Barrage has severe adverse impacts on the geomorphology, ecology, fish and fisheries of the River Padma and its branches and surrounding areas.

169. The River Brahmaputra is originated from the Manosh Shorobar (glacial) of the Koilash mountain, flows through Tibet and Assam, and enters into Kurigram, Bangladesh. From Dewanganj, Jamalpur, the Brahmaputra divided into two branches, the River Jam una and River Brahmaputra. The Brahmaputra flows through Mymensingh, Kishoreganj and Norshingdi to meet the River Meghna at Bhairabbazar (BASE 2002) while River Jam una flows through Tangail, Serajganj, Pabna and Manikganj to meet the River Padma at Goalonda. The River Teesta, originating in India, was dammed at Gajaldoba, India; water was withdrawn for the last 20 years with the consequence of siltation downstream in Bangladesh, destroying fish habitats, extinction of some species, and desertification of adjacent areas (Ghosh 2001). During the rainy season, all the 44 sluice gates of the Teesta barrage are kept open causing flood in Bangladesh. This study aims to generate data on geomorphology, ecology and fisheries of the river systems of the Rajshahi division, which will help researchers, policymakers, planners, development partners, and administrators to formulate guidelines to manage and conserve the riverine ecosystem, fish and fisheries of this division.

170. Padma River and Jamuna River are major navigation routes crossing the project area. These routes are extensively used for the transportation of goods and people. Local people use small boats and trawlers for local transportation of goods and other vessels like ships, barges, and cargo for transportation across the country through these rivers.

171. The Rajshahi division of Bangladesh has in recent decades has been afflicted by recurrent and severe droughts. Too little water in the rivers during the dry seasons and less rainfall creates drought situations. Statistics show that 92% of water in Bangladesh comes via external rivers and only 8% is local rainfall. However, the construction of barrages, hydroelectric dams, and other structural interventions in the upstream of these rivers heavily obstruct the normal flow of water towards Bangladesh. It not only creates tremendous stress on surface water resources in the northern districts of Bangladesh, but also causes a significant decrease in groundwater recharge, resulting in the depletion of soil moisture.

172. The scarcity of water in these areas has also been exacerbated by the low and uneven distribution of rainfall in recent years due to the effects of climate change. According to Bangladesh Meteorological Department (BMD), “There was 21 per cent less rain during the monsoon period from June to August in 2009 and the northern districts suffer from drought”. Drought is one of the major environmental stresses in the north that drastically limits the grain yield of rice, a staple food of Bangladeshi people. This causes a lot of people to become unemployed and fall into acute food shortage between late July and early November.

173. The surface water samples were collected from 03 (three) locations in Rajshahi division between 26 October 2021 to 08 November 2021 covering a total of 11 parameters. Surface water quality has been collected from nearest water bodies of proposed substation’s location. The reason for choosing the waterbodies is if any construction yard or labor camp established near the water body during the construction period, the water body may be contaminated. Another reason for choosing the location was, during our survey in 2021 the 6 number of rivers crossing tower location were not finalized. The locations with detailed addresses are summarized in Table IV.5. The locations of the sample collection are shown on the map (Figure IV.23). The parameters measured were pH, Turbidity, Temperature, ORP,

Electric Conductivity (EC), COD, BOD5, TDS, DO and Sulphates. EZDO 8200 Multimeter was used to conduct pH, TDS, EC, and temperature tests. Lutron DO-5509 was used to conduct the test of Dissolved Oxygen (DO).

Vill: Khuttapara; Upz:Shahjahnpur; Dist: Bogra
Bogra PBS-2

Vill: Goborchapa, Sagorpur; Upz:Bodolgachi; Dist: Naogaon
Naogaon PBS-1

Vill: Alipur; Upz:Gurudaspur; Dist: Natore
Natore PBS-2

Figure IV.23: Sampling of Surface Water in the Project Area

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Table IV-5: Test Results of Surface Water Analysis

Parameters	Unit	SW_01 Khottapara, Shahjahanpur, Bogra N-24.792203 E-89.406331	SW_05 Goborchipa, Sagorpur, Naogaon N-25.001613 E-88.960054	SW_06 Alipur, Gurudaspur, Natore N-24.344634 E-89.104948	Standards for Surface Water (best practice for fishing) by ECR'97	Analysis Method
pH*	-	6.78	7.61	7.4	6.5-8.5	Multimeter
Total Dissolved Solids (TDS)*	mg/L	100	78.3	363	NYS	Multimeter
ORP*	mV	209	-52.3	-293	NYS	Multimeter
Electric Conductivity (EC)*	µs/cm	277	120.2	552	NYS	Multimeter
Temperature*	°F	30.0	28.5	26.7	-	Multimeter
Salinity*	mg/L	136	58.8	275	-	-
BOD	mg/L	7	9	8	0.2	5 days incubation
COD	mg/L	28	36	28	4.0	CRM
Turbidity	NTU	11	13.3	18.1	10	Turbidity meter
Phosphate	mg/L	0.95	0.40	0.69	6.0	UVS

NYS= Not Yet Standard

(ii) Groundwater

174. Groundwater level in the project areas is depleting in an accelerating rate from year to year. The rate of depletion in wet season is higher than the rate in dry season. Recharging of groundwater occur mainly in between four monsoon months June-September (about 80% of rainfall occur in monsoon period in Bangladesh) and replenishment of water level by annual rainfall is overruled by annual increasing amount of withdrawal.

175. Constructing substations and distribution lines in Bangladesh can pose a threat to groundwater resources. Excavation activities during foundation laying and trenching for cables can disturb the soil, potentially allowing pollutants to seep into the groundwater. Though BREB always reduces the risks through minimizing excavation depths where possible. Use trench shielding to prevent cave-ins and limit soil disturbance. Implement proper spoil handling practices to avoid stockpiling contaminated soil near water sources. In ESMP proper management plan including mitigation measures have been discussed to prevent soil and groundwater contamination.

176. Groundwater samples were collected from Three (03) sampling locations along the project corridor from 26 October 2021 to 08 November 2021. The locations with details addresses are summarized in Table IV 6. A total of 12 Parameters were tested. All samples were collected with Kemmerer Bottle and then transferred in 1 liter plastic sampling bottles. The sampling bottles were washed by distilled water before sample collection. The sampling bottles were then kept in an ice cooler. Safety vest, hand Gloves and helmets were used during the surface water samples collection. EZDO 8200 Multimeter was used to conduct the on-site test of pH, Total Dissolved Solids (TDS), Electronic Conductivity (EC) and Temperature. Lutron DO-5509 was used to conduct the on-site test of Dissolved Oxygen (DO). The rest of the collected samples were then sent to Department of Public Health Engineering (DPHE) for analysis of remaining Parameters.


Vill: Khottapara; Upz:Shahjahnpur; Dist: Bogra
Bogra PBS-2


Vill: Goborchapa, Sagorpur; Upz:Bodolgachi; Dist: Naogaon
Naogaon PBS-1


Vill: Alipur; Upz:Gurudaspur; Dist: Natore
Natore PBS-2

Figure IV.24: Sampling of Groundwater in the Project Area

Table IV-6: Test Results of Groundwater Analysis

Parameter	Unit	GW_02 Modonpur, Polashi, Lalmonirhat N-25.933803 E-89.311287	GW_03 Mirbag, Kawnia, Rangpur N-25.760756 E-89.361436	GW_04 Birol, Dinajpur N-25.586075 E-88.542650	Standards for potable water*	Standard for potable water according to WHO	Method of Analysis
pH*	-	6.9	6.46	7.91	6.5-8.5	NYS	Multimeter

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Parameter	Unit	GW_02 Modonpur, Polashi, Lalmonirhat N-25.933803 E-89.311287	GW_03 Mirbag, Kawnia, Rangpur N-25.760756 E-89.361436	GW_04 Birol, Dinajpur N-25.586075 E-88.542650	Standards for potable water*	Standard for potable water according to WHO	Method of Analysis
Total Dissolved Solids (TDS)*	mg/L	165	170	183	1000	NYS	Multimeter
ORP*	mV	-294	16.2	15.9	NYS	NYS	Multimeter
Electric Conductivity (EC)*	µs/cm	252	259	289	NYS	NYS	Multimeter
Temperature *	°C	26.2	27.0	29.1	NYS	NYS	Multimeter
Turbidity	NTU	1.2	11.3	2.1	10	5	Turbidity meter
Arsenic	mg/L	0.001	0.001	0.001	0.05	0.01	AAS
Iron	mg/L	0.27	1.57	0.32	0.3-1	0.3	AAS
Hardness (as CaCO3)	mg/L	120	145	125	200-500	300	Calmagite Method
Chloride	mg/L	30	15	15	150-600	250	Titrimetric
Total Suspended Solid (TSS)	mg/L	1	2	1	NYS	5	Gravimetric Method

NYS= Not Yet Standard

i) Natural Hazards

177. Natural hazard events can be characterized by their magnitude or intensity, speed of onset, duration, and the area they cover. Hazards occur at different intensities (or magnitudes) over different time scales (sometimes known as temporal scales). The occurrence of hazards of different intensities in terms of probabilities or return periods, within the context of uncertainty. In general, the longer the return period the greater the intensity of the hazard. Because of these long return periods, some communities may have no memory of the potential threat of a high intensity hazard.

178. Natural hazards are naturally occurring physical phenomena. They can be: Geophysical: a hazard originating from solid earth (such as earthquakes, landslides and volcanic activity) Hydrological: caused by the occurrence, movement and distribution of water on earth (such as floods and avalanches).

(i) Seismicity

179. Bangladesh is situated in one of the most tectonically active regions in the world where three major plates meet (the Indian Plate, the Tibet Sub-Plate, and the Burmese Sub-Plate). The project area is located over the Indian Plate, which is moving north. However, due to the location of relevant plates, fault lines and hinge zones, Bangladesh itself is divided into four seismic zones based on the ranges of the seismic coefficient (note: the seismic coefficient is a measure of how strong an earthquake has the potential to be based on a combination of the mass of the plate and the seismic forces acting on it, as well as how frequently these quakes are likely to occur). As per the seismic zone map (Figure IV.25), Rajshahi division falls in all three zones. It means the project area is prone to all types of seismic intensity.

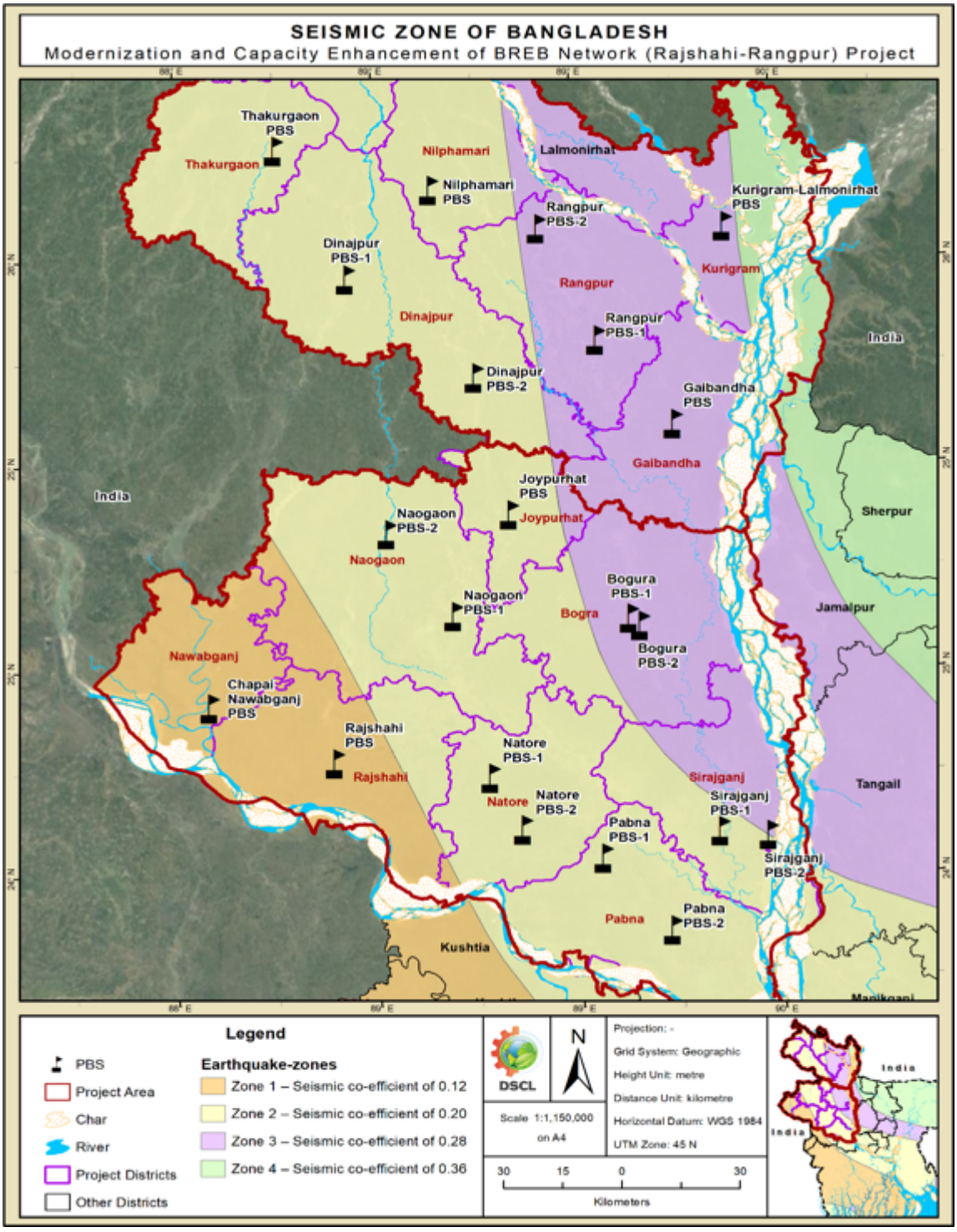

Figure IV.25: Seismic Zonation of the study area

(ii) Flood

180. Flood is a recurrent phenomenon in Bangladesh. Every year near about one-fifth of Bangladesh undergoes flood during the monsoon season. A flood season in Bangladesh may start as early as May and can continue until November.

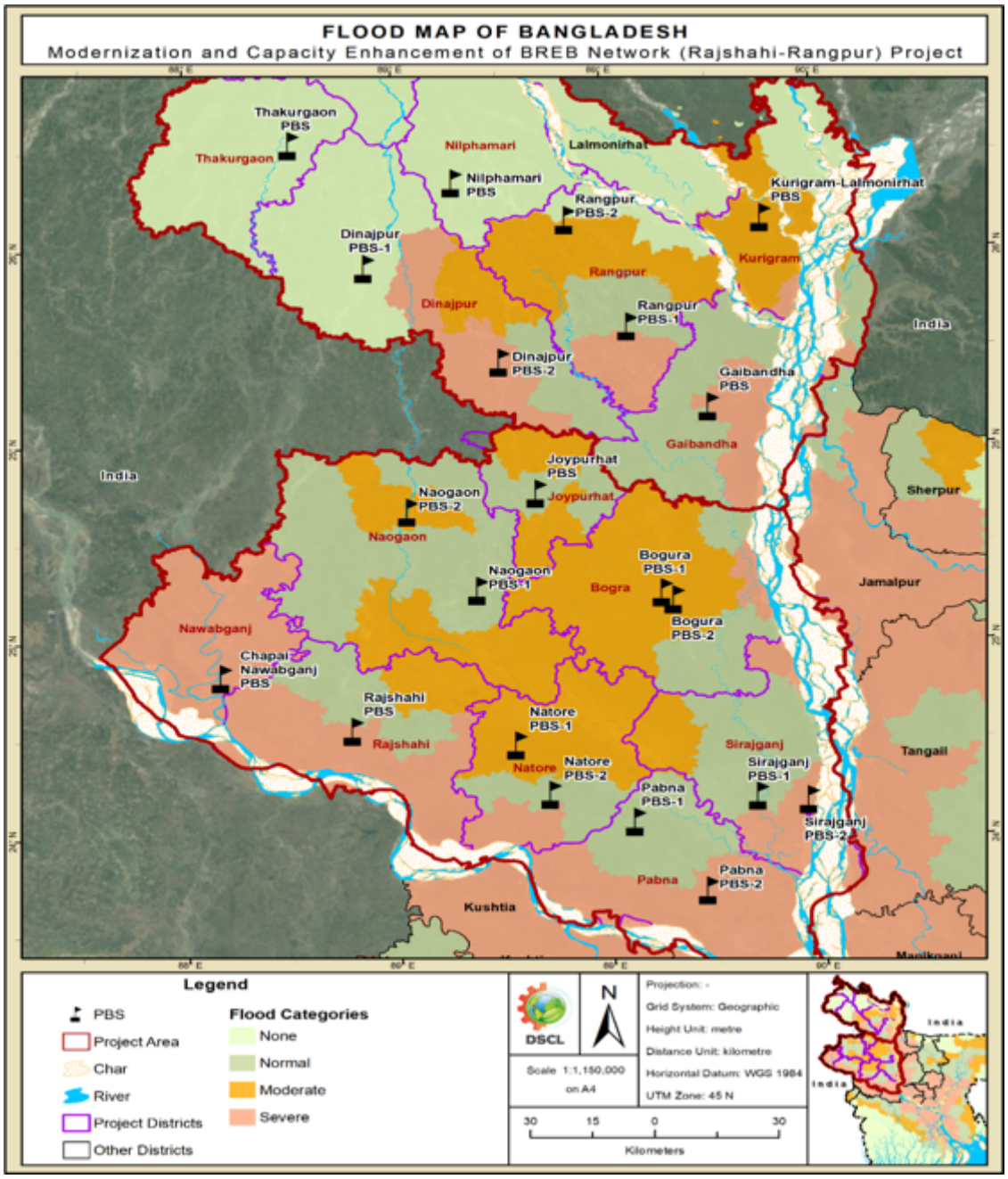

Figure IV.26: Flood Map of the study area

181. The project areas are located in low river flooding, moderate river flooding, moderate tidal surge, severe tidal surge and not flood-prone areas. The project area and their risk of flooding is showing in (Figure IV.26).

182. The Flood Forecasting and Warning Centre (FFWC), under the Bangladesh Water Development Board (BWDB), provides real-time data on water levels and flood forecasts. Here are some water levels and danger levels for various rivers in the Rajshahi division.

- Nawabganj Sadar Union: Balidanga
- Atrai River: Water Level 4.84 m, Danger Level 13.25 m
- Barisal River: Water Level 0.55 m, Danger Level 2.10 m
- Bhusirbandar River: Water Level 34.37 m, Danger Level 39.15 m

2. Biological Environment

a) Bio-ecological Zones

183. Within a relatively small geographic boundary, Bangladesh enjoys a diverse array of ecosystems. Being a low-lying deltaic country, seasonal variation in water availability is the major factor, which generates different ecological scenarios of Bangladesh. Temperature, rainfall, physiographic variations in soil and different hydrological conditions play vital roles in the country's diverse ecosystems. The ecosystems of Bangladesh could be categorized into two major groups, i.e. (i) land based and (ii) aquatic. The land-based ecosystems include forest and hill ecosystems, agro-ecosystems and homestead ecosystems; while seasonal and perennial wetlands, rivers, lakes, coastal mangroves, coastal mudflats and chars, and marine ecosystems fall into the aquatic category.

184. Each of the ecosystems has many sub-units with distinct characteristics as well. IUCN Bangladesh in 2002 classified the country into twenty-five bio-ecological zones. The subproject areas within the Rangpur division fall below the bio-ecological zone (Figure IV.27).

Figure IV.27: Bio-ecological Zone of Bangladesh

185. The Himalayan Piedmont Plain occupies most of Dinajpur and parts of Jamalpur, Netrokona, Sherpur, Sunamganj, and Barishal district. The area is composed of numerous smooth but irregular-shaped ridges with broad and braided rivers.

186. Barind Tract: Barind Tract is the largest Pleistocene physiographic unit of the Bengal basin, covering an area of about 7,770 sq km. The Barind Tract covers most parts of the greater Dinajpur, Rangpur, Pabna, Rajshahi, Bogra, Joypurhat and Naogaon districts of Rajshahi division.

187. **Tista Floodplain:** a big sub-region stretching between the Old Himalayan Piedmont Plain in the west and the right bank of the N-S flowing Brahmaputra in the east. An elongated outlier representing the floodplain of the ancient Tista extends up to Sherpur upazila of Bogra district in the south. Most of the land is shallowly flooded during the monsoon.

b) Biodiversity

188. In and around the subprojects area some wildlife species were identified as locally vulnerable. The name of these vulnerable species is Bengal monitor, Rat snake, Common

vine snake, Crested Serpent-eagle, Yellow-footed green pigeon, Common mongoose, Bengal fox, Small Indian Civet. Some species were also identified as locally endangered and these are Ring lizard, Monocellate cobra, and Jungle cat. Any construction must consider impacts on the rate of deforestation, loss of habitat, habitat fragmentation, and interruption of wildlife migration patterns.

c) Diversity of Floral and Faunal Species

189. The project areas have some flora of commercial importance. The major tree species found in the area are Mahogany, Betel nut, Raintree and (in Bengali and colloquial) Simul, Sishu, Arjun, Minjiri, Jarul, Hizal, Sheora, Krishnachura Chambal, Kadam, Royna, Koroi, Shilkoroi, Debdaru, Bot, Eucalyptus, Shilkoroi, Siris etc. No endangered floral species are reported. The dominant fruit-bearing trees include Mango, Jackfruit, Banana, Guava, Pineapple, Date, Palm, Coconut, Papaya etc. Besides domestic animals, wild dogs, jungle cat, jackal, mongoose and rodents like ants and snakes of various species are reported, though having a decreasing trend. Endangered animals like Wild cow, Wild Buffalo, Peafowl, Mugger Crocodile etc. are not reported. Mamma species like Monkey, Squirrel, Forest cat, Mongoose are available to a lesser extent. Amphibians including Kola bang, Gecho bang and Sona bang are also found to fewer extents. Some birds found in common having Bangala names Chorui, Doel, Holudpakhi, Chil, Dahuk, Babui, Koel, Kath thokra, Ghugu, Shalik, Chil, Pecha, Tia, Bok, Kak, Tuntuni, Bulbuli, Kokil etc.

190. A sizeable number of fruit, timber, fuel and medicinal trees with economic value have been observed in the SPIA areas. These trees provide a habitat for birds and some other animals. The composition of plant community includes low growing grass, herbs, shrubs and trees. A detailed list of floral species found in SPIA is shown in Table IV.7.

Table IV-7: Terrestrial Flora available in the SPIA

Scientific Name	Local Name (English Name)	Habit	Habitat	Status
• **Timber/Wood Trees**				
Swietenia mahagoni	Mehogoni	T	RS, HS	C
Azadirachta indica	Neem	T	HS	C
Albizzia procera	Koroi	T	RS, HS	C
Eucalyptus citriodora	U-caliptas	T	RS, HS	C
Dalbergia sisoo	Shishu	T	RS, HS	C
Bambosa spp.	Bash (Bamboo)	S	HS	C
Samanea saman	Raintree	T	RS, HS	C
Bombax ceiba	Shimul (Cotton Tree)	T	RS, HS	LC
Ficus infecToRia	Pakur	T	HS	LC
Polyalthia longifolia	Debdaru	T	RS	LC
Acacia aurculiformios	Akashmoni	T	RS, HS	C
Tectona grandis	Shegun	T	RS, HS	LC
Teominalia arjunna	Arjun	T	HS,RS	LC
• **Fruit Trees**				
Musa sapientum	Kalagash (Banana)	H	HS	C
Psidium guajava	Piara (Guava)	T	HS	LC
Cocos nucifera	Narikel (Coconut)	T	HS	C
Moringa oleifera	Sajna	T	HS	LC
Zizyphusm auritiana	Boroi	T	HS	LC
Citrus grandis	Jambura/Badam	S	HS	C
Aegle marmelos	Bel	T	HS	C
Feronia limonia	Kodbel	T	HS	LC
Phoenix sylvestris	Date Tree (Khejur)	T	HS,RS	C
Areca catechu	Supari (Betel Nut/Nut)	T	HS	C
Carica papaya	Pepe (Papya)	T	HS	C
Citrus aurantifolia	Labu (Lemon)	S	HS	C
Annona reticulate	Atafal	T	HS	C
Averrhoa carambola	Kamranga	T	HS	C

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Scientific Name	Local Name (English Name)	Habit	Habitat	Status
Punica granatum	Dalim	S	HS	LC
Manilkara sapota	Sobeda	T	HS	LC
Dellenia indica	Chalta	T	HS	LC
• **Fruit cum Timer Trees**				
carpus heterophyllus	Kathal (Jackfruits)	T	HS	LC
Mangifera indica	Aam(Mango)	T	HS	C
Syzygiumcumini	Jam(Blackberry)	T	HS	C
Tamerindusindica	Tetul (Tamarind)	T	HS	C
Borassusflabellifer	Tal (Palm Tree)	T	RS	LC
Elaeocarpus robustus	Jolpai (Olive)	T	HS	LC
Diospyros peregrina	Gub	T	HS,RS	LC
• **Medicinal Trees**				
Azadirachta indica	Neem	T	HS	C
Teominalia arjunna	Arjun	T	HS,RS	LC
	Bohera	T	HS	LC
	Tejpata	T	HS	LC
Ocimum canum	Tulshi	H	HS	LC
Coccinea cordifolia	Telakachu	S	HS	C
• **Fuel Trees**				
	Paiya	T	HS	C
Ficus benghalensis	Bot(Banyan Tree)	T	RS	LC
Acacia nilotica	Babla	T	HS	C
Ricinus communes	Venna	T	HS	C
Lannea coromandelica	Ziga	T	HS, RS	C
	Bonziga	T	HS	C
Ficushispida	Dumoor	T	RS	C
Anthocephalus cadamba	Kadom	T	HS	C
	Shewra	T	HS	C
	Bakul	T	HS	LC
• **Aesthetic**				
Delonix regia	Krisnochura	T	HS	LC
Cassia fistula	Sonalu	T	HS	LC
Codiaeum variegatum	Patabahar	S	HS	LC
Lawsenia inermis	Mehendi	S	HS	C
Gardenia coronaria	Gandha raj	S	HS	C
Casuarina litToRea	Jaw	T	HS	LC
Nymphaea nouchalli	Shapla	H	WL	C

Source: *Field level survey, 2017.* ***Note:*** *C-Common, LC- Less Common, UC- Uncommon, CU- Cultivated Habit: T=Tree, H= Herb, S=Shrub, G=Grass; Habitat: HS=Homestead, RS-Road side*

191. While most of the aquatic plant species of the subproject areas are subject to seasonal water level fluctuations, the abundance of wetlands supports a wide variety of aquatic biota. The common aquatic plants are Helencha (*Enhydro fluctuans*) Kalmi (*Ipomoea aquatica*), DholKalmi (*Ipomaoa fistulosa*), Cheicha (*Scirpus articulatus*), Kochuripana (*Eichorina crassipes*), Shapla (*Nymphaea nouchali*), Ducbweed (*Spiredella sp.*), Khudipana (*Lemna minor*), and Topapana (*Pistia stratiotes*).

192. The reproduction, breeding and multiplication of aquatic fishes are very finely tuned and adjusted to the rhythm and amplitude of monsoon flooding in and around the proposed cluster. There are many fishermen within the cluster whose income source is mainly fishing from the haor and beel as well as natural canals.

193. Pankauri (Indian Cormorant), Dhushor Bok (Grey Heron), Maachranga (Kingfisher) and Gangchil (Gull-billeded Tern) are the birds commonly found during field visit in the subproject areas. Leaving aside the other common birds like crows, sparrows, shaliks, cuckoos etc. and some domestic cattle, no other wild animals inhabit the area. The wildlife

that fully depends on the terrestrial land throughout their whole life, their existence, shelter, food, nesting, breeding and also producing own offspring is called terrestrial fauna. Core components of the terrestrial fauna are amphibians, reptiles, birds and mammals.

194. A number of avian species were observed in the area. These species are typical inhabitants of urban fringes and considered common both at local and regional levels. In addition to the avian species, the area is in habitat to a variety of reptiles, mammals and invertebrates. These include foxes, rodents, snakes, etc. A detailed list of faunal species found in the subproject area is presented in Table IV-.8.

195. Fresh water fish habitat such as river, haor, pond and ditches exist in and around the subproject areas, which provide shelter, feeding, and spawning ground for different types of freshwater fish species (such as carp, catfish, mrigel, taki, shoel, tengra, bain, baila, boal etc.). There are several natural habitats for aquatic flora and fauna in SPIA. The reproduction, breeding and multiplication of aquatic fishes are very finely tuned and adjusted to the rhythm and amplitude of monsoon flooding in and around the proposed cluster. There are many fishermen within the cluster in subproject areas whose income source is mainly fishing from the rivers.

196. The diversified habitat and ecosystem in the project area support various types of wildlife as given in Table IV-.8, Most of the faunal species such as (Avians, Amphibians, Reptiles and Mammals) were identified in the SPIA areas by using books and description of the local people during the field survey which are given in the following Table Table IV-.8.

Table IV-8: List of Faunal Species Available in the SPIA

Scientific Name	English Name	Local Name	Local Status
Bufo melanostictus	Common Toad	Kuno bang	NO
Rana temporalis	Bull Frog	Kola bang	NO
R. pipens	Grass Frog	Sona bang	NO
Class: Reptilia			
Hemidactylus flaviviridis	Common House Lizard	Tiktiki	NO
Calotes versicolor	Common Garden Lizard	Rokto-chosha	NO
Varanus bengalensis	Bengal moniToR	Gui shap	VU
Varanus salvaToR	Ring lizard	Kalo gui	EN
Xenochrophis piscaToR	Checkered keelback	Dhora shap	NO
Amphiesma stolata	Stripped keelback	Dora shap	NO
Enhydris enhydris	Common smooth water snake	Paina shap	NO
Coluber mucosus	Rat snake	Daraj shap	VU
Ahaetulla nasutus	Common vine snake	Laodoga shap	VU
Atretium schistosum	Olive keelback	Maitta shap	NO
Naja naja	Monocellate cobra/ Spectacled cobra	Khoia gokhra	EN
Class: Aves			
Ardeola grayii	Indian pond heron	Kani bok	NO
Casmerodius albus	Great egret	Sada bok	NO
Egretta intermedia	Intermediate egret	Mazla bok	NO
Egretta garzetta	Little egret	Choto bok	NO
Nycticorax nycticorax	Black-crowned night heron	Nishi bok	NO
Ixobrychus cinnamomeus	Cinnamon Bittern	Lal bok	NO
Anastomus oscitans	Asian Openbill	Shamuk-khol	NO
Haliastur indus	Brahminy kite	Shankho chil	NO
Milvus migrans	Black kite	Bhubon chil	NO
Actitis hypoleucos	Common sandpiper	Kada Khocha	--
Streptopelia chinensis	Spotted dove	Tila Ghughu	NO
Streptopelia decaocto	Eurasian collared dove	Raj Ghughu	NO
Psittacula krameri	Rose-ringed parakeet	Tia	NO
Amaurornis phoenicurus	White-breasted waterhen	Dahuk	NO
Eudynamys scolopacea	Asian cuckoo	Kokil	NO

Scientific Name	English Name	Local Name	Local Status
Centropus sinensis	Greater coucal	Kanakua	NO
Cuculus micropterus	Indian cuckoo	Bou-kotha-kao Pakhi	NO
Athene brama	Spotted owlet	Khuruley Pencha	NO
Alcedo atthis	Common kingfisher	Choto Maachranga	NO
Halcyon smyrnensis	White-throated kingfisher	Sada buk Maachranga	NO
Ceryle rudis	Pied kingfisher	Pakra Maachranga	NO
Megalaima haemacephala	Coppersmith barbet	Choto Basanta Bauri	NO
Oriolus xanthornus	Black-headed oriole	Holdey Pakhi	NO
Corvus splendens	House crow	Pati Kak	NO
Dicrurus macrocercus	Black drongo	Fingey	NO
Copsychus saularis	Oriental magpie robin	Doel	NO
Acridotheres fuscus	Jungle myna	Jhuti Shalik	NO
A. tristis	Common myna	Bath Shalik	NO
A. ginginianus	Bank myna	Gang Shalik	NO
Sturnus contra	Asian pied starling	GoBrey Shalik	NO
S. malabaricus	Chestnut-tailed starling	Kath Shalik	NO
Pycnonotus cafer	Red-vented bulbul	Bulbuli	NO
Turdoides striatus	Jungle babbler	Satbhai	NO
Orthotomus suToRius	Common tailorbird	Tuntuni	NO
Passer domesticus	House sparrow	Charui	NO
Ploceus philippinus	Baya weaver	Babui	NO
Upupa epops	Eurasian Hoopoe	Hudhud Pahkhi	
Class: Mammalia			
Pteropus giganteus	Flying Fox	Badur	NO
Pipistrellus coromandra	Indian Pipistrelle	--	NO
Megaderma lyra	Greater False Vampire	Badur	NO
Herpestes edwarsi	Common Mongoose	Bara benji	VU
H. auropunctatus	Small Indian Mongoose	Benji	NO
Vulpes bengalensis	Bengal Fox	Khek shial	VU
Rattus rattus	Common House Rat	Indur	NO
Bandicota indica	Bandicoot Rat	Bara indur	NO
B. bengalensis	Lesser Bandicoot Rat	Indur	NO
Mus musculus	House Mouse	Nengri indur	NO
Suncus murinus	House Shrew	Chicka	NO

Source: Baseline Environmental Survey, 2018 and Literature Review and IUCN Red Data Book (2003). Notes: EN – Endangered, VU – Vulnerable, NO – Not Threatened

197. Fish is the most important aquatic fauna of the subproject areas, along with other groups. The aquatic fauna includes Prawns (*Macrobrachium spp.*), crabs, snails (*Pila*, *Vivipara*, *Lymna* etc.), freshalater mussels (*Lamellidens sp.*) etc. Kolabang (*Rana tigrina*); Guishap (*Varanus bengalensis*) and Matia sap (*Enhydris enhydris*) are common. The aquatic birds are – Pancowri (*Phalacrocorax carbo*), Kanibok (*Ardeola grayii*), Sadabok (*Egretta garzetta*), Borobok (*Egretta alba*), Machranga (*Halcyon pileata*), Dahuk (*Gallicrex cinerea*), and winter migratory birds – Balihash (*Dendrocygna javanica*) and Chakha (*Tadorna ferruginea*).

Table IV-9: Common Fish Species in the SPIA

Sl. No.	Local Name	Scientific Name	English Name	Local Status
1	Tengra	*Batasio batasio*	Tista Batasio	NO
2	Pabda	*Ompok pabo*	Pabo catfish	EN
3	Puti	*Puntius sophore*	Spotfin Swamp Barb	NO
4	Darkina	*Esomus danricus*	Flying barb	DD
5	Dhela	*Osteobrama cotio*	Cotio	EN
6	Chela	*Salmostoma acinaces*	Silver Razorbelly Minnow	DD
7	Rui	*Labeo sp.*		DD
8	Catla	*Catla catla*	Catla	NO

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Sl. No.	Local Name	Scientific Name	English Name	Local Status
9	Mrigal	*Cirrhinus mrigala*	Mrigal	NO
10	Ayre	*Aorichthus aor*	Longwhiskered Catfish	VU
11	Chital	*Notopterus chitala*	Humped Featherback	EN
12	Boyal	*Wallago attu*	Freshwater	NO
13	Pungus	*Pangasius pangasius*	Pungas	CR
14	Elish	*Tenualosa ilisha*	Hilsha	NO
15	Bele	*Awaous gutum*		NO
16	Foli	*Notopterus notopterus*	Grey featherback	VU
17	Koi	*Anodontosoma chachunda*	Chachunda	NO
18	Mola	*Amblypharyngodon mola*	Pale carplet	NO
19	Chapila	*Gonialosa manmina*	Ganges River	NO
20	Baim	*Mactacembalus armatus*	Tire truck spineel	EN
21	Gajar	*Channa marulius*	Giant snakehead	EN
Note: EN= Endangered, VU= Vulnerable, CR= Critically Endangered, NO= Not Threatened, DD= Data Deficiet				

Source: Baseline Environmental Survey, 2021 and Literature Review and IUCN Red Data Book (2015)

d) Biodiversity/Environmentally Sensitive Areas

198. Many wildlife species are in stress in Bangladesh, many more are endangered / threatened, and a large number already faced extinction. The status of faunal species in Bangladesh has been published by IUCN (2000). According to the IUCN findings this country has lost 10% of its mammalian fauna, 3% avifauna and 4% reptiles over the last 100 years. More than 50 species are presently critically endangered in Bangladesh of which 23 species are already declared as endangered in the Red Data Book of IUCN. In addition, 83 species are commercially threatened and are included in the appendices of Convention on International Trade in Endangered Species (CITES). Among the most endangered species are: elephant, tiger, wild Cat, Leopard or wild goat, serao, dolphin; birds: white-winged duck, comb duck, stork, carne, pheasant, partridge, and crocodile, python, monitor, lizard, tiger terrapin, roofed turtle, soft turtle, and marine turtles.

199. In and around the subprojects area some wildlife species were identified as locally vulnerable. The name of these vulnerable species is Bengal monitor, Rat snake, Common vine snake, Crested Serpent-eagle, Yellow-footed green pigeon, Common mongoose, Bengal fox, Small Indian Civet. Some species were also identified as locally endangered and these are Ring lizard, Monocellate cobra, and Jungle cat. Any construction must consider impacts on the rate of deforestation, loss of habitat, habitat fragmentation, and interruption of wildlife migration patterns.

3. Socio-economic Environment

200. It is essential for every development project, whether small or large, to understand the social, human and economic aspects of the primary stakeholders, i.e., people living in and around the project site. The following tools and techniques were used to collect the relevant data/information on the social and economic aspects of affected people:

- Literature review;
- Group discussion; and
- Informal meetings with various professionals.

201. In addition, data obtained from secondary sources were compared with the primary data/information gathered during the study.

202. Data on population, age/sex composition, household patterns, and sources of drinking water, sanitation facility, and ownership of agricultural land were enumerated from the latest community series census published by the Bangladesh Bureau of Statistics (BBS).

a) Administrative Structures

203. Bangladesh is divided into eight administrative division. Each Division is divided into Districts/Zilas; there are 64 Districts within Bangladesh. Districts/ Zila's are subdivided into Upazilas (there are 483 Upazilas in Bangladesh), which consist of a number of Union Parishads. Union Parishads of which there are 4486 in Bangladesh are the locally elected governments at the village level.

204. The Project consists of several components under thirteen PBSs of Thirteen districts within Rajshahi division of Bangladesh. The study area covers 70 Upazilas and 558 unions as presented in Table IV-10.

Table IV-10: Administrative areas under 13 PBS

District	Upazila/ Thana/ City Corporation/ Pourashava	Unions
BOGRA	Adamdighi	6
	Bogra Sadar	11
	Dhunat	10
	Dhupchanchia	6
	Gabtali	11
	Kahaloo	9
	Nandigram	5
	Sariakandi	12
	Sherpur	9
	Shibganj	12
	Sonatala	7
	Shajahanpur	10
Subtotal	**12**	**108**
JOYPURHAT	Joypurhat Sadar	9
	Akkelpur	5
	Khetlal	5
	Panchbibi	8
	Kalai	5
Subtotal	**5**	**32**
NAOGAON	Mohadevpur	10
	Shapahar	6
	Raninagar	8
	Porsha	6
	Patnitala	11
	Dhamoirhat	8
	Naogaon Sadar	12
	Niamatpur	8
	Atrai	8
	Manda	14
	Badalgachi	8
Subtotal	**11**	**99**
NATORE	Bagatipara	5
	Baraigram	7
	Gurudaspur	6
	Lalpur	10
	Natore Sadar	12

District	Upazila/ Thana/ City Corporation/ Pourashava	Unions
	Singra	12
Subtotal	**6**	**52**
CHAPAI-NAWABGANJ	Gomostapur	8
	Bholahat	4
	Nachol	4
	Nawabganj Sadar	14
	Shibganj	15
Subtotal	**5**	**45**
PABNA	Atghoria	5
	Bera	7
	Chatmohar	11
	Faridpur	6
	Ishwardi	7
	Bhangura	6
	Sujanagar	10
	Santhia	10
	Pabna Sadar	10
Subtotal	**9**	**72**
RAJSHAHI	Godagari	9
	Paba	8
	Bagha	6
	Bagmara	16
	Charghat	6
	Durgapur	7
	Mohanpur	6
	Puthia	6
	Tanore	7
Subtotal	**13**	**71**
SIRAJGANJ	Tarash	8
	Ullapara	13
	Sirajganj Sadar	10
	Shahzadpur	13
	Raiganj	9
	Kazipur	11
	Chowhali	5
	Belkuchi	6
	Kamarkhand	4
Subtotal	**9**	**79**
Total	**70**	**558**

b) Quality of Life Indicator

(i) Population & Households

205. Population densities in Bangladesh are relatively high throughout the country. In the Rajshahi division, the average sex ratio is 100.4; the total population is about 18.5 million; male 51.53%, female 48.47%; Average population density is 1007 persons per km^2. Naogaon district has the lowest population density in the project area and Sirajganj district has the highest with more than 1,230 persons per km^2.

Table IV-11: Demographic Characteristics of the Study Area

District	Household	Population	Male	Female	Sex Ratio	Area (km^2)	Persons/ (km^2)
Bogra	865,100	3,400,874	17,08,806	16,92,068	101.1	2,920	1154
Joypurhat	242,400	913,768	459,284	454,484	101.3	965	942
Naogaon	655,400	2,600,157	1,300,227	1,299,930	100.1	3,436	750
Natore	424,600	1,706,673	854,183	852,490	100.6	1,896	894
Chapai nawabganj	357,000	1,647,521	810,218	837,303	97.0	1,703	960
Pabna	589,300	2,523,179	1,262,934	1,260,245	100.2	2,372	1053
Rajshahi	634,300	2,595,197	1,184,448	1,102,426	102.1	2,407	1069
Sirajganj	713,800	3,097,489	1,551,368	1,546,121	100.2	2,498	1230
Rajshahi division	4,481,900	18,484,858	9,525,247	8,959,610	100.4	18,197	1007

(ii) Religion

206. According to the population and housing census (2011), the population of the project areas is dominated by the Muslim community constituting almost 92.05% of the total population. The remaining 7.95% is primarily constituted by Hindus with Christians, Buddhists and others comprising an in smaller percentage.

Table IV-12: Religious Profile of the Study Area

District	Total Population	Muslim	Hindu	Christian	Buddhist	Others
Bogra	3,400,874	92.02	7.86	0.10	0.01	0.03
Joypurhat	913,768	87.72	11.11	0.35	0.00	0.82
Naogaon	2,600,157	86.26	12.67	0.44	0.00	0.63
Natore	1,706,673	87.34	11.52	0.90	0.00	0.24
Chapai nawabganj	1,647,521	96.27	3.68	0.03	0.00	0.02
Pabna	2,523,179	93.69	6.23	0.07	0.00	0.01
Rajshahi	2,595,197	93.16	5.74	0.75	0.02	0.33
Sirajganj	3,097,489	92.66	7.31	0.01	0.01	0.01
Rajshahi division	18,484,858	92.05	7.40	0.34	0.00	0.20

(iii) Age Structure of the Project Area

Population and Housing census (2011) shows that age structure in the project area covers 31.3% of the total population are children (ages up to 14 years), 60.6% are of working age i.e., between 15 to 59 years, which is considered as the active workforce. Table IV-10 Shows the population distribution by different age groups in the project area.

Table IV-13: Age structure of the Study Area

District	Percentage of Population in Each Age Group (%)									
	0-4	5–9	10-14	15-19	20-24	25-29	30-49	50-59	60-64	65+
Bogra	9.3	11.1	10.3	8.1	9.2	10.1	27.0	7.1	2.8	4.9
Joypurhat	8.4	10.2	9.9	7.8	8.7	10.1	29.0	7.5	4.9	3.4
Naogaon	8.7	10.6	10.0	8.1	9.3	10.1	28.0	7.2	2.9	5.1
Natore	9.1	11.0	10.3	8.2	9.1	10.0	27.4	6.8	4.4	3.6
Chapai nawabganj	10.5	12.6	12.1	9.3	9.2	8.7	24.5	6.3	4.1	2.8
Pabna	9.3	10	10.2	9.1	9.3	9.5	25	6.5	4.3	3.5
Rajshahi	8.4	10.3	10.7	9.1	9.9	10.1	27.2	6.6	2.6	4.6
Sirajganj	11.2	14	11.8	8.3	7.5	8.6	24	6.9	4.5	3.3
Rajshahi division	9.4	11.2	10.7	8.5	9.0	9.7	26.5	6.9	3.8	3.9

(iv) Literacy

207. The literacy rate for the population 7 years and above in the project area is 63.46% which is higher than the national literacy rate of 58.77%. Similarly, male literacy rate in the project area is higher than the national literacy rate whereas female literacy rate in the project area is lower than that of the country as a whole. Joypurhat district shows the highest literacy rates at 73.74% for males and 65.98% for females. While Sirajganj has the lowest rates at 56.84% for males and 53.80% for females.

Table IV-14: Literacy Rates by Each District in the Project Area

District	Total Literacy		Male Literacy		Female Literacy	
	Total Population	% of Total Literate	Total Male Population	% of Males Literate	Total Female Population	% of Females Literate
Bogra	2267367	66.67	1191721	69.74	5431316	62.69
Joypurhat	638724	69.90	338676	73.74	299869	65.98
Naogaon	1660720	63.87	87018	66.92	788730	60.68
Natore	1092271	64.00	59030	67.07	50344	60.91
Chapai nawabganj	940240	57.07	45890	56.64	481198	57.47
Pabna	1617610	64.11	741864	65.88	654266	62.30
Rajshahi	1489442	65.13	807911	68.21	682512	61.91
Sirajganj	1830711	56.84	985310	59.82	846645	53.80
Rajshahi division	11730491	63.46	6305714	66.20	5431316	60.62

(v) Occupations & Livelihood

208. According to the Population and Housing Census of Bangladesh (2011), approximately 30% of the total population in the study area are employed whereas 0.64% of peoples have no work. Also, 28.68% are involved in household work and 26.48% of the total population do not work.

Table IV-15: Occupation and Livelihood in the Project Area

District	Total Population	Employed	Looking for work	Household work	Do not work
Bogra	3,400,874	1,035,123	22,086	992,544	883,464
Joypurhat	913,768	286,044	6,149	279,060	228,394
Naogaon	2,600,157	820,517	16,750	791,386	633,388
Natore	1,706,673	517,098	11,697	503,984	443,644
Chapai nawabganj	1,647,521	461,755	9,885	466,151	447,350
Pabna	2,523,179	741,309	16,625	692,650	683,459
Rajshahi	2,595,197	770,627	20,916	733,696	745,107
Sirajganj	3,097,489	890,985	14,609	841,635	830,321
Rajshahi division	18,484,858	5,523,458	118,717	5,301,106	4,895,127

(vi) Housing Conditions

209. According to the population and housing census (2011), the predominant structure of project areas is Kutcha (55.2%) followed by Semi-Pucca (27.8%), Pucca (12.8%), and Jhupri (4.2%). In the project areas, about 28.6% of households use no water-sealed sanitary latrine including 37.9% non-sanitary and 24.3% water-sealed sanitary latrine. On contrary, 9.2% of households have no access to latrine facilities and defecate in open places.

(vii) Disability

210. Rates of disability provide an indication of social condition and wellbeing. Table IV-13 shows that the overall disability rate in the project area is 1.58%. Six categories are defined in the Census i.e., disability in speech, vision, hearing, physical, mental and autism. Among

these categories, physical disability is at the highest level with 114901 persons, which is 0.60% of the total population.

Table IV-16: Distribution of Population by Type of Disability

District	Total Population	Type of Disability (%)						
		Total	Speech	Vision	Hearing	Physical	Mental	Autism
Bogra	3,400,874	52373	6122	10543	5441	20745	7142	2040
		1.54	0.18	0.31	0.16	0.61	0.21	0.06
Joypurhat	913,768	14072	1827	3107	1645	5756	2010	640
		1.63	0.2	0.34	0.18	0.63	0.22	0.07
Naogaon	2,600,157	42643	4680	9361	3900	16901	5720	1820
		1.64	0.18	0.36	0.15	0.65	0.22	0.09
Natore	1,706,673	27990	3072	4949	2560	11776	4096	1536
		1..64	0.18	0.29	0.15	0.69	0.24	0.09
Chapai nawabganj	1,647,521	27184	3130	5602	2801	10709	3624	1153
		1.65	0.19	0.34	0.17	0.65	0.22	0.07
Pabna	3,011,180	41253	5721	6926	3914	15959	6625	2409
		1.37	0.19	0.23	0.13	0.53	0.22	0.08
Rajshahi	2,595,197	35904	3888	5260	2973	12120	5031	1829
		1.57	0.17	0.29	0.15	0.65	0.25	0.06
Sirajganj	3,220,814	50567	5475	12239	4831	20935	8052	1933
		1.58	0.19	0.38	0.16	0.6	0.18	0.08

(viii) Water

211. Within the project areas, the major source of drinking water is a tube -well where about 87.8% populations use tube-well water. On the other hand, only 3.0% of people have access to tap water. Other 9.3% of people have access to neither tube-well nor tap water and consequently have to rely on nearest surface water sources i.e., river, pond, or canal.

212. Electricity is an important indicator for measuring quality of life. In these project areas, only 54.36% of the households have electricity connections.

Table IV-17: Water Access within the Project Areas

District	No. of HH	Source of Drinking Water (%)		
		Tap	Tube-well	Other
BOGRA	865,100	4.11	93.58	2.31
JOYPURHAT	242,400	2.15	94.82	3.04
NAOGAON	655,400	3.18	89.84	6.97
NATORE	424,600	2.07	93.62	4.31
CHAPAI NAWABGANJ	357,000	8.30	88.16	3.55
PABNA	589,300	2.05	93.57	4.37
RAJSHAHI	634,300	8.09	88.54	3.37
SIRAJGANJ	713,800	1.34	95.47	3.19
RAJSHAHI DIVISION	4,481,900	3.0	87.8	9.3

(ix) Fuel Sources

213. In the Sirajganj and Bogra area under Rajshahi division most of the households have natural gas connection (50%) for cooking purposes but rest of the districts except Sirajganj and Bogra don't have any natural gas connection. They depend on fuel wood, but fuel wood is costly. Field survey work indicated that households use leaves, cow dung, wood/straw for cooking purposes. In some households within urban areas use LPG gas for cooking purposes.

(x) Electricity

214. Electricity is an important indicator for measuring quality of life. In these project areas, only 54.36% of the households have electricity connections. So, this project will increase the efficiency of electricity throughout the project area.

Table IV-18: Electricity Access within the Project Areas

District	No. of HH	Electricity Connection (%)
BOGRA	865,100	57.90
JOYPURHAT	242,400	55.30
NAOGAON	655,400	36.70
NATORE	424,600	58.50
CHAPAI NAWABGANJ	357,000	49.70
PABNA	589,300	62.30
RAJSHAHI	634,300	71.10
SIRAJGANJ	713,800	43.40
RAJSHAHI DIVISION	4,481,900	54.36

(xi) Transport & Communication

215. The proposed subprojects are located near national highways, Upazila roads, or near village roads. The common types of transport are bus, truck, microbus, car, CNG, motorcycle, van, and rickshaw. Mobile and wire telephone services are available in most areas. During the field survey, it was found that there are several kinds of vehicles are running on the adjacent roads to the subprojects.

(xii) Poverty level

216. The average poverty rate in Rajshahi Division is 28.93%. Notably, the lowest poverty rate within this division is in Boalia upazila of Rajhashi District, where it is only 9%, while the district average is 20.1%. The highest poverty rate is in Naogaon's Porsha upazila, reaching 48.7 %, while average of Naogaon district is 32.2 %. Rajshahi Division has made progress, but addressing poverty remains a fundamental challenge.

217. A significant portion of the population in this division relies on agriculture and related activities for their livelihood. These sectors are often vulnerable to factors like weather fluctuations and market price variations.

218. Beyond agricultural vulnerability, Rajshahi Division suffers from shortcomings in infrastructure, particularly in rural areas. This lack of infrastructure creates hurdles in accessing markets, essential financial services, and educational opportunities. Limited access to education and skills training restricts people from finding well-paying jobs outside of agriculture, trapping them in a cycle of low income. The situation is further exacerbated by inadequate social safety nets, which leave vulnerable populations without support during crises or hardships.

219. Average Poverty rate in Rajshahi is 28.9 % accordance with the HIES 2016. A list for each district of Rajshahi division is given below showing the upper poverty level as per head count ratio method.

Table IV-19: Upper poverty level in Rajshahi DIvision

District	HCR Upper (%)
Bogra	27.2
Joypurhat	21.4
Naogaon	32.2
Natore	24

*OFFICIAL USE ONLY

District	HCR Upper (%)
Chapai nawabganj	39.6
Pabna	33
Rajshahi	20.1
Sirajganj	30.5
Rajshahi division	28.9

(xiii) Gender & Employment

220. The Bangladesh Bureau of Statistics (BBS) Integrated Household Survey and Income and Expenditure Survey (HIES) of 2018 provides valuable insights into the employment landscape across 17 districts of Bangladesh, encompassing both formal and informal sectors. The data illustrates notable variations in both male and female employment rates, shedding light on the economic dynamics at the district level.

Table IV-20: Employment rate in Rajshahi Division

Districts	Male Employment Rate (%)	Female Employment Rate (%)
Bagura	65.7	34.3
Naogaon	62.6	32.4
Natore	61.9	32.1
Pabna	65	34

Source: HEIS: 2018

221. These statistics underscore the disparities in employment between genders and highlight the dual nature of the labor market, comprising both formal and informal sectors. The findings emphasize the need for targeted policies to enhance workforce participation and promote gender equality across all districts of Bangladesh, while addressing the unique challenges posed by the informal sector. Further analysis and research can provide deeper insights into the factors influencing employment patterns, aiding in the formulation of effective strategies for inclusive economic growth. Traditionally, societal expectations in Rajshahi Division, as in many parts of South Asia, often confine women to domestic responsibilities. This relegates them to informal work, which goes largely unrecorded in official statistics. A study by BRAC, a prominent Bangladeshi NGO, found that social norms significantly influence attitudes towards gender roles, with a higher prevalence of equitable attitudes in urban areas compared to rural areas6 .This suggests that cultural shifts are needed to dismantle these barriers. Limited access to education and skills training further disadvantages women. Bangladesh has made significant strides in girls' education, but gender parity remains a challenge, particularly in rural areas 7.

222.

(xiv) Gender & Earning

Table IV-21: Daily average earning rate in Rajshahi Division

District	Male	Female
Bagura	517	404
Joypurhat	479	369
Naogaon	473	342
Natore	460	360
Nawabganj	513	300
Pabna	635	423

[6] Exploring Attitude towards Gender Norms among the Youth Population in Bangladesh https://www.brac.net/program/gender-justice-and-diversity/

[7] Gender in Bangladesh https://blogs.worldbank.org/en/education/how-provide-opportunities-all-girls-education-womens-labor-force-participation-bangladesh

District	Male	Female
Rajshahi	522	250
Sirajganj	508	500
Divisional Average of Rajshahi	**513**	**369**

223. Continuing the analysis of daily average wage rates of agricultural laborers with and without food in the Rajshahi Division, April 2023 data reveals notable disparities across districts. On average, male laborers earn 496 Taka with food and 489 Taka without, while female counterparts earn 367 Taka with food and 378 Taka without.

224. In Rajshahi, male laborers receive 484 Taka with food and 477 Taka without, while females earn 396 Taka with food and 385 Taka without. In Naogaon, male laborers earn 475 Taka with food and 403 Taka without, compared to females earning 364 Taka with food and 346 Taka without. Natore exhibits male wages at 407 Taka with food and 450 Taka without, and female wages at 300 Taka with food and 315 Taka without. In Nawabganj, there's no male data, but females earn 500 Taka without food. Bogura sees male wages at 444 Taka with food and 467 Taka without, with no female data, while Joypurhat records male wages at 618 Taka with food and 636 Taka without, and female wages at 406 Taka with food and 413 Taka without. Pabna lacks male data but sees females earning 0 Taka without food. Sirajganj has no data for males or females, but male laborers earn 508 Taka with two meals.

225. Several factors contribute to these unequal wages. Gender discrimination is a persistent issue, with societal norms undervaluing women's agricultural work. This translates to lower wages despite potentially performing similar tasks. Skill and experience might also play a role, with men perceived as performing heavier duties or having more expertise, leading to higher pay. However, the case of Joypurhat, where female wages surpass the average male rate, suggests skill specialization or unique local labor practices. Location also influences wage rates. Districts facing labor shortages might offer higher wages to attract workers, impacting male vs. female rates depending on the specific agricultural activity and labor needs.

226. It's important to acknowledge the limitations of the data. Missing information for some districts and genders hinders a complete understanding. Informal arrangements, where meals are provided but not explicitly recorded, might be underrepresented.

227. The analysis underscores significant gender disparities in wage rates across districts within the Rajshahi Division, with females consistently earning less than males. Data gaps for female wages in some districts highlight challenges faced by women in the agricultural labor sector. Addressing these disparities is vital for promoting gender equality and ensuring equitable wages for all laborers. Policymakers must prioritize measures to bridge the wage gap and enhance working conditions for female agricultural workers in the Rajshahi Division.

(xv) Women's Right

228. The condition of women's rights in the Rajshahi division of Bangladesh is influenced by multiple factors, including gender-based violence, economic participation, and socio-cultural norms. Community leaders and experts identify illiteracy, lack of awareness, and unsupportive family dynamics as primary barriers to women's empowerment. Only 30-40% of decision-making roles within households are held by women, reflecting deep-seated gender biases. Despite 91% of agency employees perceiving gender equality in information access, significant urban-rural disparities exist, with 96% of participants acknowledging that access varies depending on women's age, favoring younger women in urban areas[8].

[8] https://www.cartercenter.org/resources/pdfs/peace/ati/bangladesh-women-mixed-methods-study-ati.pdf

229. Efforts to raise awareness and improve access to support services for GBV victims are critical but remain insufficient. Although the legal framework guarantees equal protection, enforcement at the local level is weak (PLOS) (RSIS International). Addressing these issues requires comprehensive strategies, including legal reforms, economic empowerment programs, and cultural shifts, to ensure that women in both urban and rural areas can fully exercise their rights and achieve equality.

(xvi) Decision Making

230. In Rajshahi Division, while estimates suggest women hold approximately 30-40% of decision-making roles within households, social norms and limited mobility often constrain their participation in community decision-making processes. Initiatives promoting women's empowerment and education may gradually improve their involvement in decision-making at both household and community levels.

231. A study focusing on women's empowerment in Rajshahi Division revealed significant insights into the gender dynamics within households and communities. In many cases, traditional gender roles restrict women's involvement in decision-making, both at home and in broader community settings9. However, there are ongoing efforts to enhance women's roles in governance and economic activities. For instance, the implementation of gender-responsive budgeting (GRB) in Rajshahi aims to ensure that financial planning and resource allocation consider the specific needs of women. This initiative, supported by UN Women, includes training and developing frameworks for local government officials to integrate gender perspectives into their budgeting processes.

232. In terms of political representation, women in Rajshahi Division have made strides, though challenges persist. Female representation in local government has increased, yet it remains below desired levels for achieving gender parity. Cultural and social barriers, including limited access to education and economic resources, continue to hinder women's full participation in decision-making roles.

233. Efforts to empower women economically through microfinance and entrepreneurial support have shown promising results in Rajshahi. Women engaging in small-scale businesses and agriculture report increased confidence and influence within their households. These economic activities not only improve their financial status but also elevate their decision-making power regarding household and community issues.

234. Overall, while Rajshahi Division has made progress in promoting gender equality in decision-making, ongoing efforts are essential to address deep-seated cultural norms and provide women with the necessary tools and opportunities to participate fully in all aspects of life.

c) Community Property Resources

235. Throughout the world, some assets are neither private nor state property, but common property. The term denotes a class of institutions that govern the ownership and rights of access to assets. Common property assets are to be distinguished from "public goods," in that, unlike the latter, used by someone of a unit of a common property asset typically reduces the amount available to others by one unit (in economic terminology, such an asset is rivalrous in use). The institution of the common property creates and harbors reciprocal externalities. As some of the most interesting examples of common property assets are natural resources, this entry is restricted to them. Social Institutions, Khals, Playgrounds can be referred to as common property resources. Hats, Markets, and fairs are social institutions or at least the mechanism of not only trade but also social interaction. During survey works no major educational and religious institutions were observed at substations site and distribution line

[9] https://asiapacific.unwomen.org/en/countries/bangladesh/national-planning/gender-responsive-budgeting

areas. BREB always prioritized those areas where no interventions affect the properties of the local community.

d) Conflict of interest and law and order situation

236. Police stations have been established in every Upazila to maintain the law and order of Upazila. The project sites are under the jurisdiction of this model Police Station (PS). An officer in charge (OC) rank of Bangladesh Police is in Charge of the PS. DC office also is aware of the project.

e) Historical, Cultural, and Archaeological Sites

237. In the Rajshahi division there are lot of historical, cultural and archaeological sites. Among them World heritage site · Buddhist Vihara at Paharpur. Religious Site. Puthia Temple Complex, Historic Walking Area. Mahasthangarh, Religious Site. Kantajew Temple, Castle. Tajhat Palace, Religious Site. Bagha Mosque are markable

238. New substation sites are located in semi-urban/rural areas on land owned by the government or private individuals. Most of the substation locations are on cultivated land with standing crops, few trees, and vegetation growth of mainly shrubs and grasses. There are no archaeological sites, sensitive cultural or biodiversity receptors of international, national, state, or district importance including protected areas, key biodiversity areas, forest areas, sacred groves, or historical/cultural monuments around the identified substation sites or along the alignments.

4. Substation's Site-Specific Baseline (Rajshahi Division)

When the survey was conducted, all of the substation's locations were not yet fixed, that's why the survey team surveyed the project location on sample basis where most of the land are purchased. Detailed information based on survey outcomes is described in the following table.

Table IV-22: Site-specific information of surveyed substation's location

Name of PBS	Proposed Substation Location	Baseline condition of the existing substations	Picture
Bogra PBS-2	Shahjahanpur	This substation site lying in agricultural land. Total amount of the land is 43 decimals. A local road passing through the substations site. Vegetation Cover is moderate. There is no household and resettlement within 200 meters of the project location.	
Thakurgaon PBS	Jabarhat	The proposed substation site mainly identified as barren land. There is no large vegetation coverage around the project site. No housing or settlement was identified within 200 m.	

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Name of PBS	Proposed Substation Location	Baseline condition of the existing substations	Picture
Noagaon PBS	Goborchapa	The substation site lying within agricultural land. A few bricks field located around in 550 meter. There is a approach road beside the project location. Within 300 m there are some settlement. There is a pond 150 away from the proposed site.	
Natore PBS	Gurudashpur	The proposed site is situated near a mosque. There are lot of bareen land and several pond around the site. Some household settlement is 200m away from the propsed site.	

239. Land of the newly purchased substations were used for variety of crop production only a single substation area is used for banana gardening. Land of 18 new substations were used for double cropping farming and in remaining 4 substations, owners/tenants sometimes practice triple cropping but due to unavailability of labors at dull period they sometimes drop the cultivation in that specific season. In terms of variety of crop production, it is noted that 7 of the purchased substation land produced variety of crops i.e. Paddy, Pulse, Maize, Vegetable & Cash Crops while remaining are used for paddy cultivation only. In Kahaloo, land of Kahaloo-2 SS is used for single cropping and in remaining time it is inundated by monsoon water, but development of this land could not disrupt the connectivity with surrounding wetland.

240. According to the land audit a table is given below on land Use of Crop Variety Prior to Purchase.

Table IV-23: Land Use of Crop Variety Prior to Purchase

District	List of SS	Land Size (dec)	Land Use Prior to Purchase	Crop Variety Prior to Purchase
Chapa	Bholahat-2	44	Gardening (Banana Trees)	Banana Garden
Pabna	Pabna Sadar-3	50	Crop Cultivation	Vegetable, Spices
Bogura	Gabtoli-4	45	Crop Cultivation	Paddy
Rajsh	Tanore-4	57.55	Crop Cultivation	Paddy
Bagura	Dhunat-2	40	Crop Cultivation	Paddy
Pabna	Atghoria-3	50	Crop Cultivation	Paddy, Pulse, Vegetable & Cash Crops
pabna	Chatmohar-3	51	Crop Cultivation	Paddy, Vegetable & Cash Crops
Bagura	Gabtoli-3	44	Crop Cultivation	Paddy
Pabna	Bhangura-3	50	Crop Cultivation	Paddy, Cash Crops
Natore	Gurudaspur-3	40	Crop Cultivation	Paddy, Maize

*OFFICIAL USE ONLY

District	List of SS	Land Size (dec)	Land Use Prior to Purchase	Crop Variety Prior to Purchase
Bogura	Shajahanpur-2	43	Crop Cultivation	Paddy
Bogura	Kahaloo-2	45	Crop Cultivation	Paddy
Natore	Singra-4	39.18	Crop Cultivation	Paddy
Natore	Natore-4	40	Crop Cultivation	Paddy, Vegetable & Cash Crops
Natore	Baghmara-5	50	Crop Cultivation	Paddy
Natore	Puthia-3	55	Crop Cultivation	Paddy
Natire	Baghmara -4	40	Crop Cultivation	Paddy, Maize
Natore	Charghat -3	41.8	Crop Cultivation	Paddy, Maize & Cash Crop

241. Among the audited 30 substations of Rajshahi & Rangpur divisions25 SS are surrounded by the villages from all four sides (North, South, East and West) within 1 km radius of the centre of respective substations.

Table IV-24: Distance of Settlement from the Substations Location of Rajshahi Division

SS List	North	South	East	West
Bholahat-2	410 m	500 m	400 m	760 m
Pabna Sadar-3	0 m	100 m	100 m	600 m
Gabtoli-4	500 m	600 m	600 m	700 m
Tanore-4	120 m	130 m	320 m	580 m
Dhunat-2	500 m	100 m	500 m	400 m
Atghoria-3	200 m	400 m	900 m	0
Chatmohar-3	500 m	900 m	150 m	100 m
Gabtoli-3	800 m	700 m	500 m	500 m
Gomastapur-1	100 m	540 m	10 m	300 m
Rajshahi PABA-3	240 m	10 m	100 m	600 m
Shibganj-2	50 m	750 m	870 m	150 m
Dinajpur - 2	280 m	225 m	92 m	75 m
Godagari-1	200 m	130 m	118 m	130 m
Bhangura-3	700 m	0	800 m	300 m
Gurudaspur-3	700 m	20 m	200 m	200 m
Shajahanpur-2	300 m	400 m	500 m	200 m
Kahalu-2	200 m	500 m	500 m	400 m
Singra-4	290 m	343 m	95 m	707 m
Natore-4	300 m	170 m	200 m	639 m
Baghmara-5	500 m	600 m	400 m	800 m
Puthia-3	550 m	400 m	800 m	1000 m
Durgapur -1	50 m	50 m	50 m	50 m
Baghmara -4	247 m	264 m	268 m	705 m
Charghat -3	40 m	136 m	222 m	635 m

C. RANGPUR DIVISION

1. Physical Environment

a) Climate

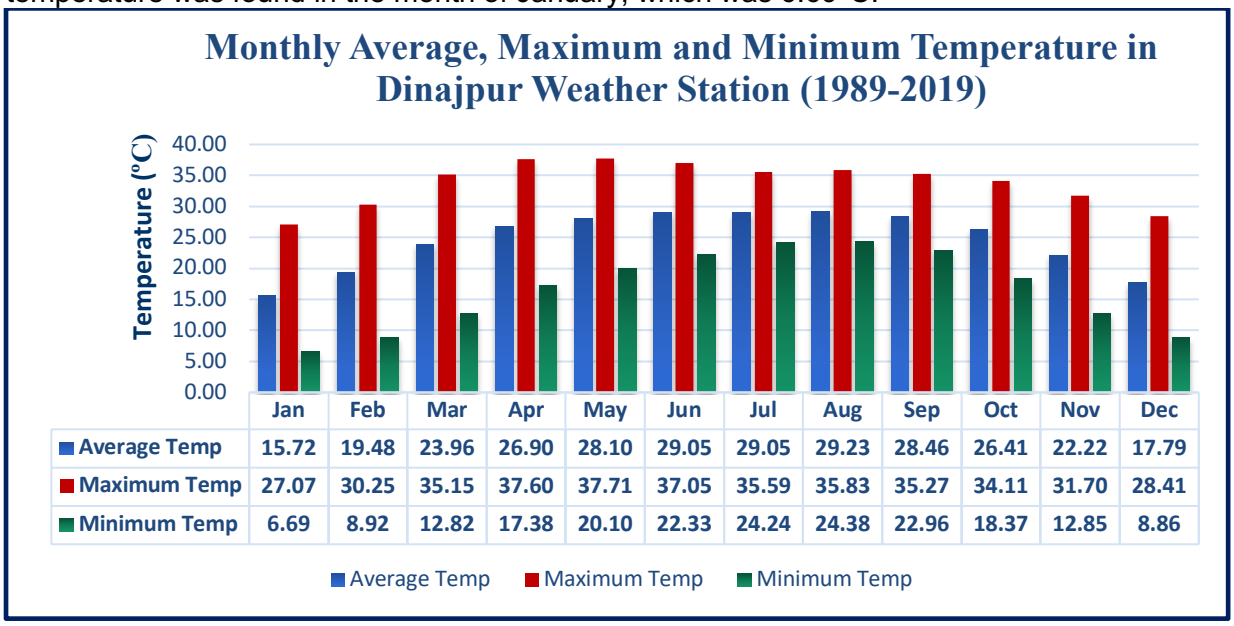
242. According to the classification, the Rangpur division is located in the Northern part of the Northern region and the North-western climatic zone (Figure IV-1). Rangpur Division has a humid subtropical climate, close to a tropical monsoon climate. The climate of Rangpur has generally characterized monsoons, high temperature, considerable humidity, and heavy rainfall, although the more pleasant "winter" season from November to February is dry with very warm rather than hot afternoons and cool mornings. The average annual temperature in Rangpur is 24.9 °C (76.8 °F). About 2,192 mm (86.30 in) of precipitation falls annually, although there is very little rain from November to March.

243. The climatic condition of the whole project area may be considered the same as reported as per Dinajpur, Rangpur, and Saidpur stations of Bangladesh Meteorological Department (BMD) since these stations are within the project areas. The climatic diagrams are based on 30 years of weather model simulations. The weather models with historical data from 1989 to 2019 onwards and generated a continuous 30-year global history with hourly weather data.

(i) Temperature

244. The northwestern region of Bangladesh has a tropical monsoon climate characterized by moderately warm temperatures. There is different scenario in seasonal temperature occur across the area. It is influenced by latitude and monsoon activities (Brammer, 1996). The cold winter air that moves into this region from the northwestern part of India loses much of its intensity by the time. In all stations, the lowest normal minimum temperatures are experienced in January. The average annual temperature in Rangpur is 24.9 °C (76.8 °F). Figures 4.28 to 4.30 shows the detailed temperature pattern in the project areas.

245. At the Dinajpur weather station of the Bangladesh Meteorological Department, monthly average temperatures were gathered from 1989 to 2019. From the figure IV.28, the highest average recorded temperature was around 38°C in April-May. The lowest average recorded temperature was found in the month of January, which was 6.69°C.

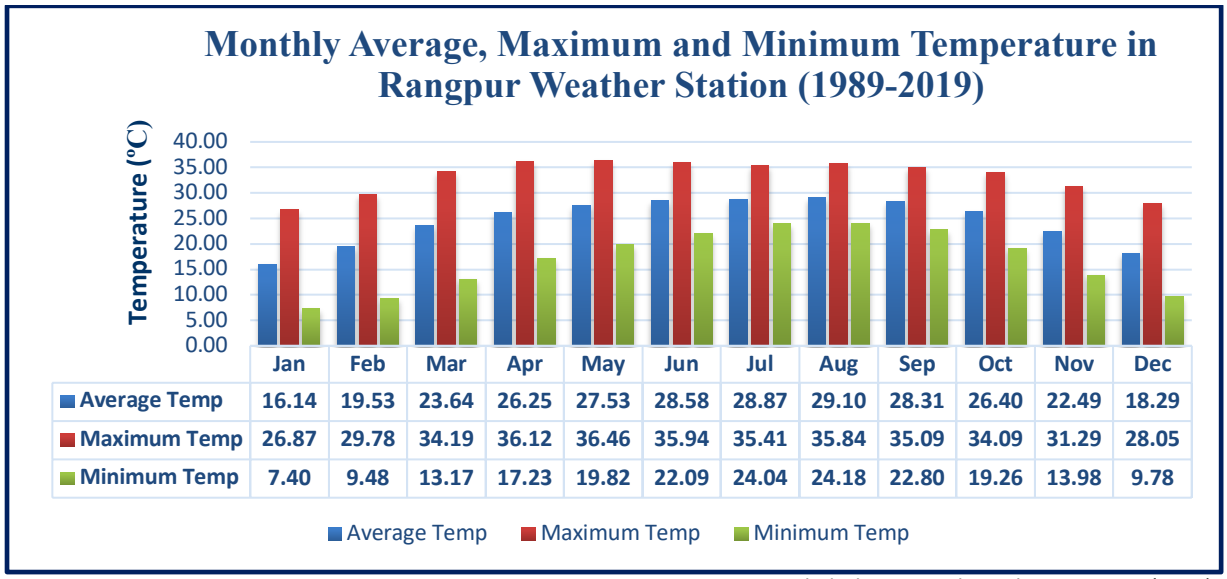


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Temp	15.72	19.48	23.96	26.90	28.10	29.05	29.05	29.23	28.46	26.41	22.22	17.79
Maximum Temp	27.07	30.25	35.15	37.60	37.71	37.05	35.59	35.83	35.27	34.11	31.70	28.41
Minimum Temp	6.69	8.92	12.82	17.38	20.10	22.33	24.24	24.38	22.96	18.37	12.85	8.86

Source: Bangladesh Meteorological Department (BMD)

Figure IV.28: Monthly Average, Maximum and Minimum Temperature of Dinajpur Weather Station

246. At the Rangpur weather station of the Bangladesh Meteorological Department, monthly average temperatures were gathered from 1989 to 2019. From the figure IV.29, the highest average recorded temperature was around 36.5°C in May. The lowest average recorded temperature was found in the month of January, which was 7.40°C.

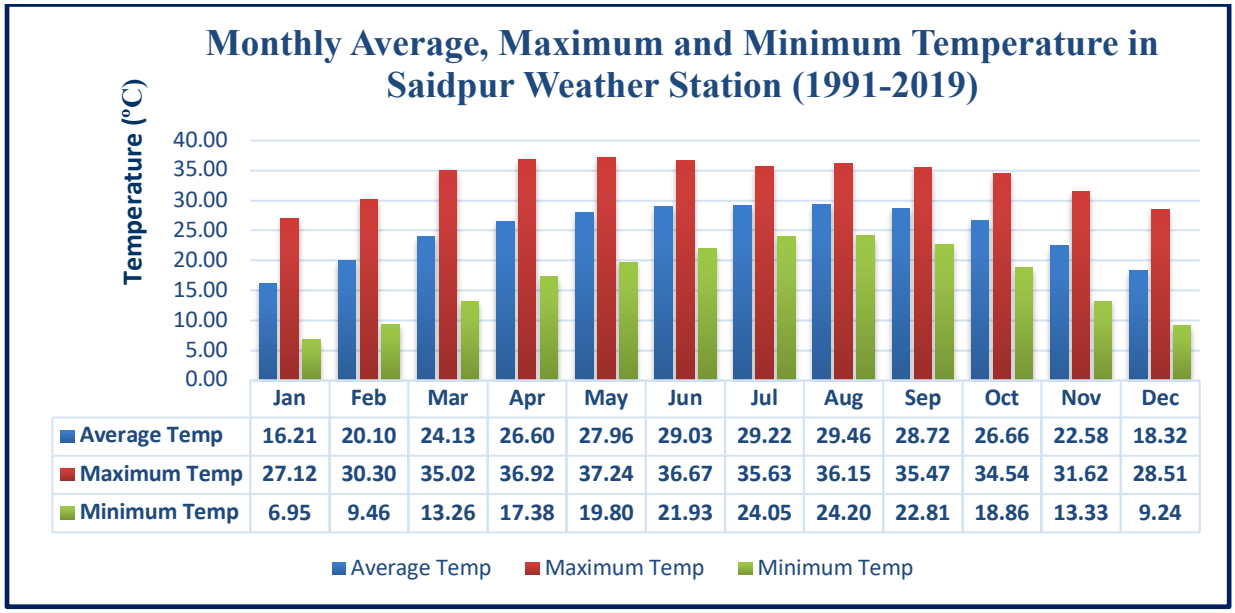


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Temp	16.14	19.53	23.64	26.25	27.53	28.58	28.87	29.10	28.31	26.40	22.49	18.29
Maximum Temp	26.87	29.78	34.19	36.12	36.46	35.94	35.41	35.84	35.09	34.09	31.29	28.05
Minimum Temp	7.40	9.48	13.17	17.23	19.82	22.09	24.04	24.18	22.80	19.26	13.98	9.78

Source: Bangladesh Meteorological Department (BMD)

Figure IV.29: Monthly Average, Maximum and Minimum Temperature of Rangpur Weather Station

247. At the Saidpur weather station of the Bangladesh Meteorological Department, monthly average temperatures were gathered from 1989 to 2019. From the figure IV.30, the highest average recorded temperature was 37.24°C in May. The lowest average recorded temperature was found in the month of January which was almost 7°C.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Temp	16.21	20.10	24.13	26.60	27.96	29.03	29.22	29.46	28.72	26.66	22.58	18.32
Maximum Temp	27.12	30.30	35.02	36.92	37.24	36.67	35.63	36.15	35.47	34.54	31.62	28.51
Minimum Temp	6.95	9.46	13.26	17.38	19.80	21.93	24.05	24.20	22.81	18.86	13.33	9.24

Source: Bangladesh Meteorological Department (BMD)

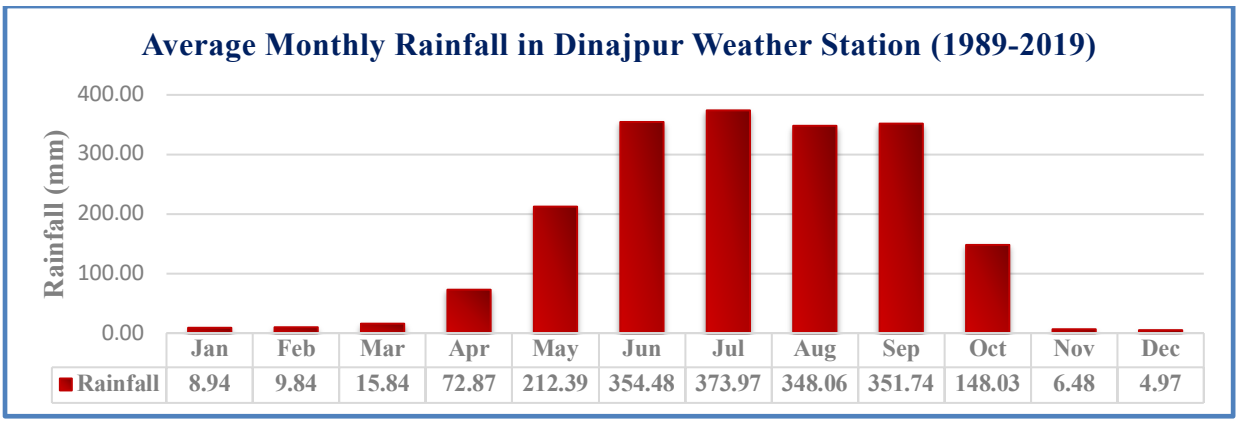
Figure IV.30: Monthly Average, Maximum and Minimum Temperature of Saidpur Weather Station

(ii) Rainfall

248. Rangpur has obtained the highest catchment area and it is the biggest rainfall region of Rangpur Division. The study has been distinctly observed an increasing trend of catchment boundaries for Rangpur, Saidpur, Dinajpur. Evaluating the rainfall contour lines, it has been found that the average rainfall annually is about 2,192 mm (86.30 in) in Rangpur Division. The

average number of rainy days in this region mostly varies from 86 to 112 days per year. Figure IV.31 to IV.33 shows the detailed temperature pattern in the project areas.

249. The rainfall data obtained from the Dinajpur weather station shows that the highest rainfall occurs in July and the lowest rainfall occurs in December during winter season. From the figure IV.24, the highest average recorded rainfall was near 374 mm in July. The lowest average recorded rainfall was found in the month of December which was around 5 mm.

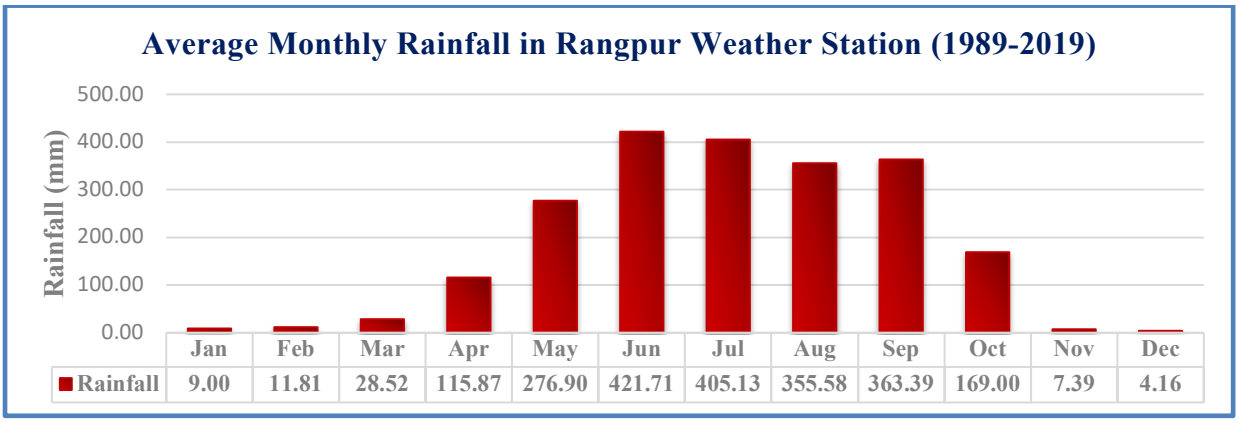


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall	8.94	9.84	15.84	72.87	212.39	354.48	373.97	348.06	351.74	148.03	6.48	4.97

Source: Bangladesh Meteorological Department (BMD)

Figure IV.31: Average Monthly Rainfall of Dinajpur Weather Station

250. The rainfall data obtained from the Rangpur weather station shows that the highest rainfall occurs in June and the lowest rainfall occurs in December during winter season. From the figure IV.32, the highest average recorded rainfall was 421.71 mm in June. The lowest average recorded rainfall was found in the month of December, which was 4.16 mm.

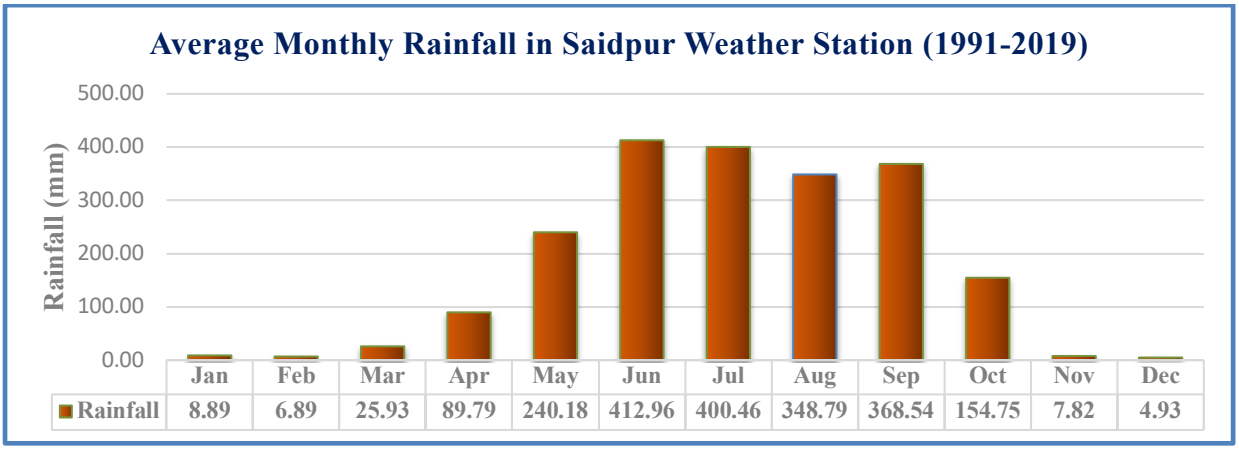


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall	9.00	11.81	28.52	115.87	276.90	421.71	405.13	355.58	363.39	169.00	7.39	4.16

Source: Bangladesh Meteorological Department (BMD)

Figure IV.32: Average Monthly Rainfall of Rangpur Weather Station

251. The rainfall data obtained from the Saidpur weather station shows that the highest rainfall occurs in June and the lowest rainfall occurs in December during winter season. From the figure IV.26, the highest average recorded rainfall was near 413 mm in June. The lowest average recorded rainfall was found in the month of December, which was 4.93 mm.

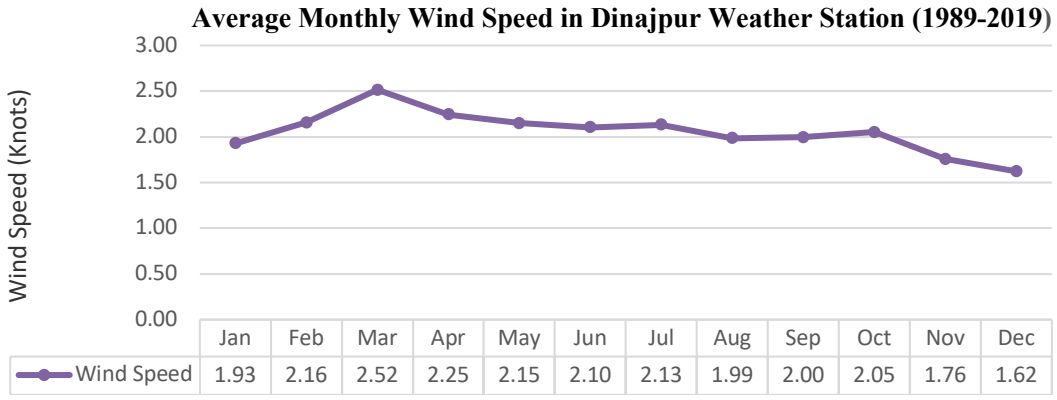


Source: Bangladesh Meteorological Department (BMD)

Figure IV.33: Average Monthly Rainfall of Saidpur Weather Station

(iii) Wind Speed and Direction

252. Wind speed data across the project area show variation from location to location and is also dependent on the time of year. The windiest months of the year tend to be during the pre-monsoon period. Wind speeds stay high during the summer monsoon but gradually decrease until November which is usually the calmest month in the project area. Figure IV.34 to IV.39 shows the details Wind speed pattern in the project areas.



Source: Bangladesh Meteorological Department (BMD)

Figure IV.34: Average Monthly Wind Speed of Dinajpur Weather Station

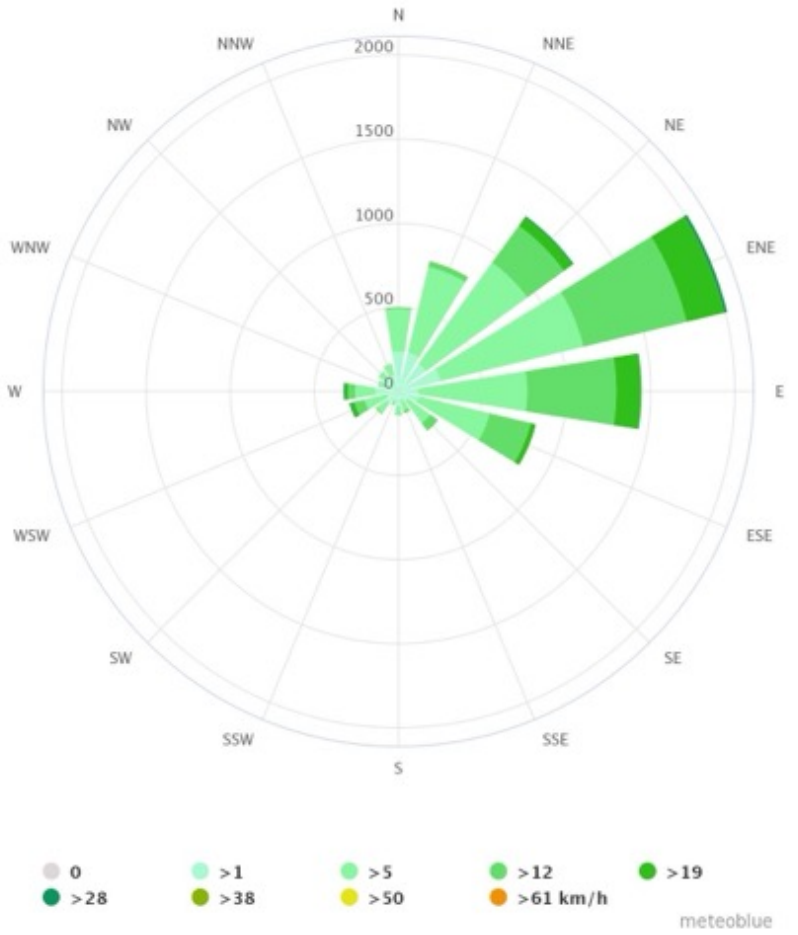
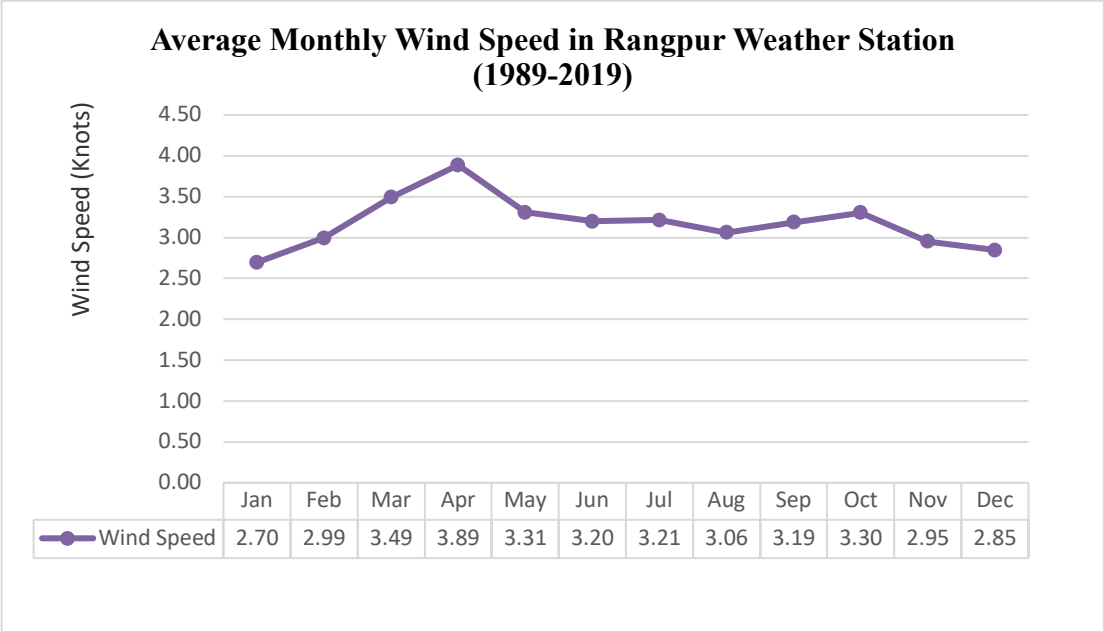


Figure IV.35: Wind rose diagram of Dinajpur Weather Station



Source: Bangladesh Meteorological Department (BMD)

Figure IV.36: Average Monthly Wind Speed of Rangpur Weather Station

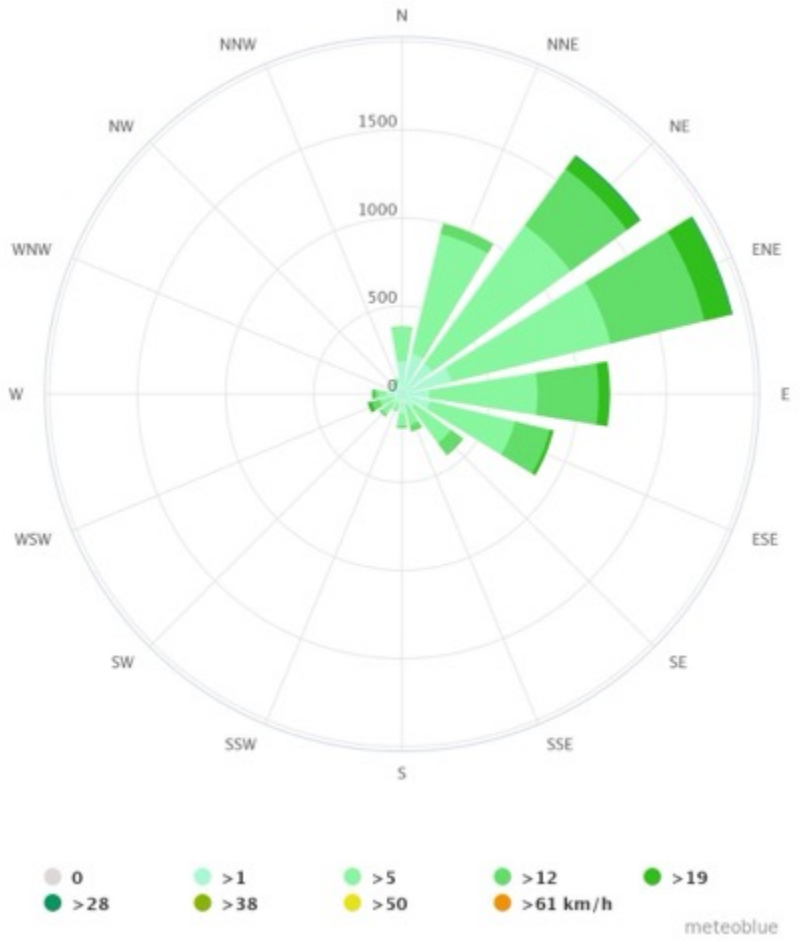
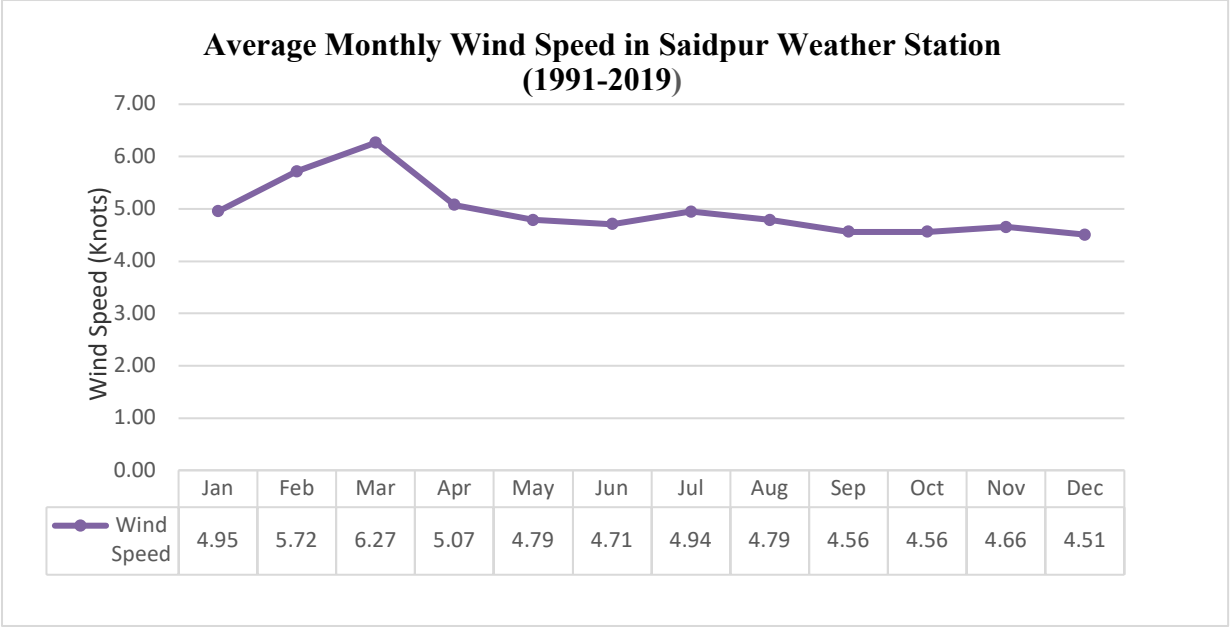


Figure IV.37: Wind rose diagram of Rangpur Weather Station



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind Speed	4.95	5.72	6.27	5.07	4.79	4.71	4.94	4.79	4.56	4.56	4.66	4.51

Source: Bangladesh Meteorological Department (BMD)

Figure IV.38: Average Monthly Wind Speed of Saidpur Weather Station

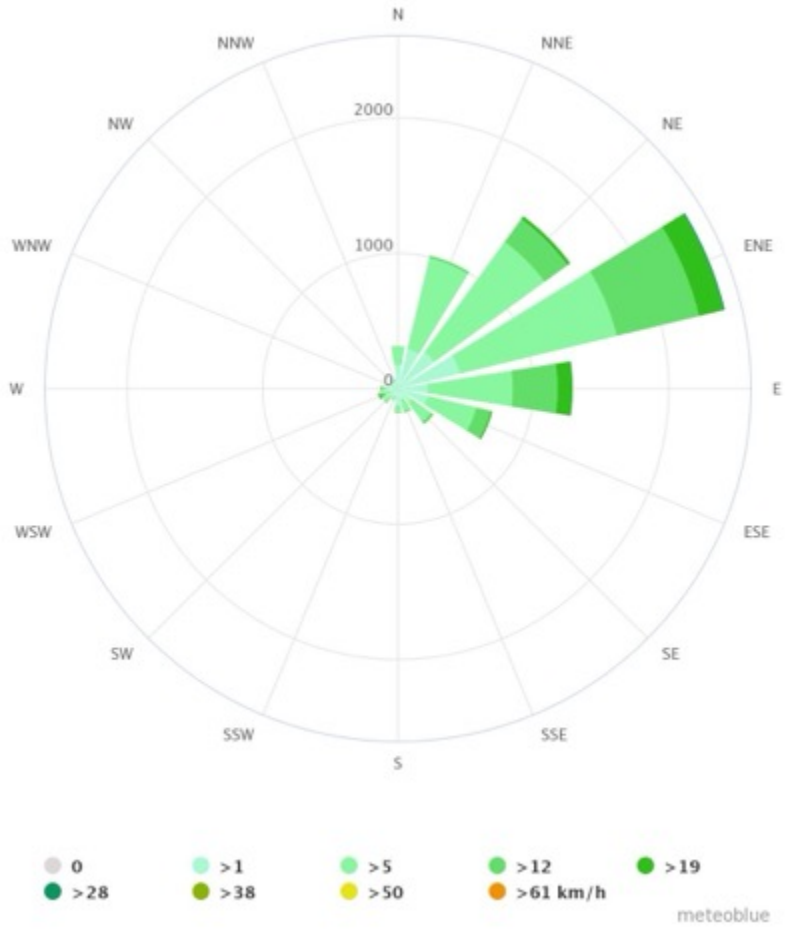
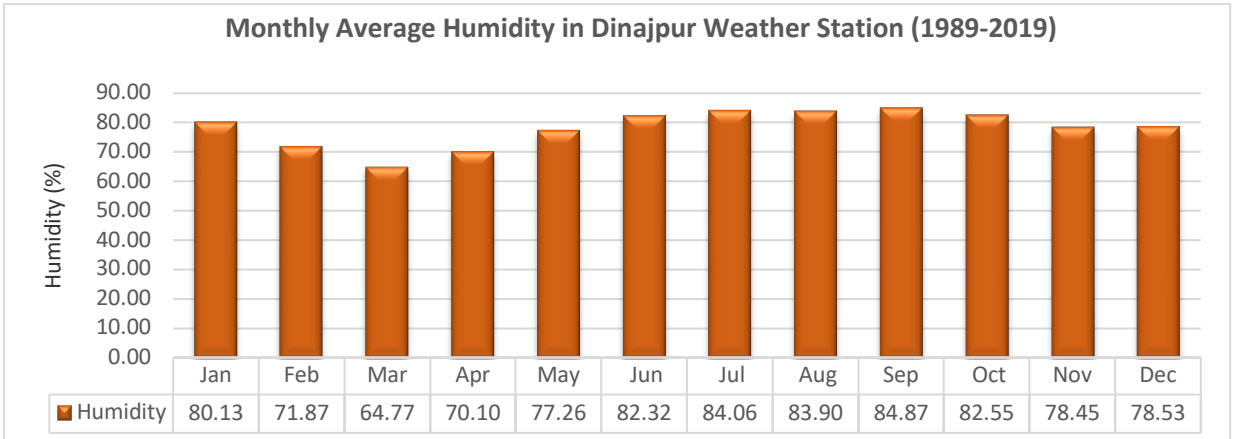


Figure IV.39: Wind rose diagram of Saidpur Weather Station

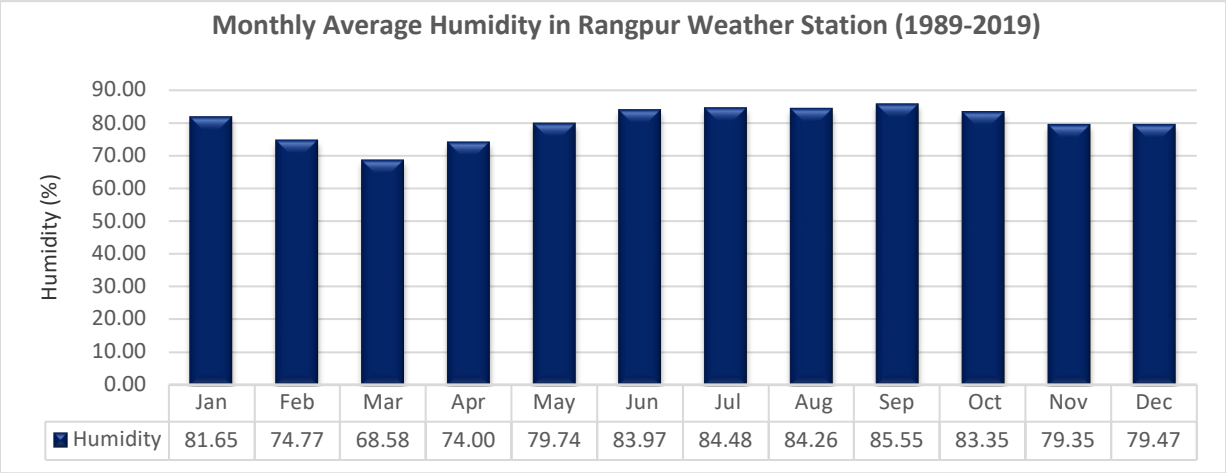
(iv) Relative Humidity

253. Humidity across the general project area shows similar variation during the year with the highest readings between June and September (figure IV.40 - IV.42) in the height of the monsoon rains. Humidity is highest at rangpur experiences 85.55% humidity in September. The lowest recorded average monthly humidity 63.45 % in March at Saidpur.



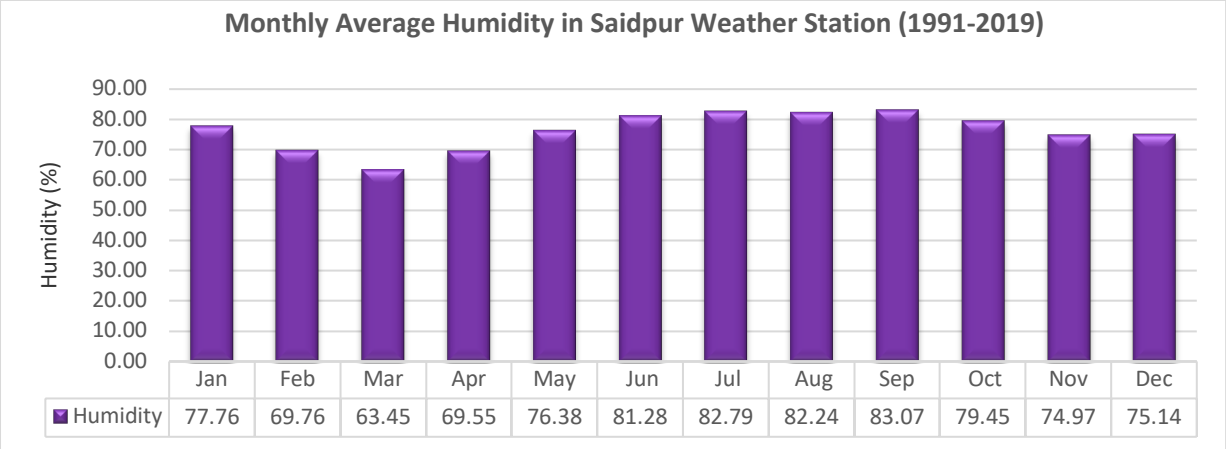
Source: Bangladesh Meteorological Department (BMD)

Figure IV.40: Average Monthly Relative Humidity of Dinajpur Weather Station



Source: Bangladesh Meteorological Department (BMD)

Figure IV.41: Average Monthly Relative of Rangpur Weather Station



Source: Bangladesh Meteorological Department (BMD)

Figure IV.42: Average Monthly Relative of Saidpur Weather Station

b) Topography

254. Topography of a land surface includes its relief and contours, the distribution of mountains and valleys, the patterns of rivers, and all other features, natural and artificial, that produce the landscape. Although Bangladesh is a small country, it has considerable topographic diversity. It has three distinctive features: (i) a broad alluvial plain subject to frequent flooding, (ii) a slightly elevated relatively older plain, and (iii) a small hill region drained by flashy rivers. The general topography of the project area slopes from north to south with elevation ranged from 30m a.m.s.l to 300 m a.m.s.l. The sub-project areas mainly comprise plain agricultural land and almost flat. The elevation of Panchagarh ranges between 75 to 300 m a.m.s.l. In the Central, position the elevation stands range between 30 m a.m.s.l.

c) Physiographic Features

255. The physiography is the form of the earth's surface. In Bangladesh this may be classified into three distinct physiographic regions (a) floodplains, (b) terraces, and (c) hills. Each physiographic region has unique distinguishing characteristics. The three main physiographic regions can be further subdivided into 24 sub-regions and 54 sub-units.

256. The Rangpur division as well as the subprojects in this division comprises the following major physiographic units (Figure IV.17).

257. A portion of the Old Himalayan Piedmont Plain stretches into Bangladesh at the northwestern corner of the country, which occupies the whole of Thakurgaon, and major parts of Panchagarh and Dinajpur districts.

258. Jamuna (Young Brahmaputra) Floodplain an alternative name used for the mighty Brahmaputra River, because the Jamuna channel is comparatively new, and this course must be clearly distinguished from that of the older one.

d) Geology

259. The stable Precambrian platform occupies mostly Rangpur areas and is characterized by limited to the moderate thickness of sedimentary rocks above a Precambrian igneous and metamorphic basement. This unit is geologically stable in relative terms and has not been affected by fold movement. Some fault-bounded graben basins occur within the Precambrian Basement. These basins contain coal-bearing rock units of the Permian Period (286 to 245 million years ago), the oldest sedimentary rock found in Bangladesh. The Precambrian platform is divided into a northern Rangpur Saddle with a very shallow Precambrian basement (130 to 1,000m) and a southern Bogra Shelf with a basement at moderate depth (1 to 6 km). Sedimentary layers in the Bogra shelf dip very gently towards the southeast until it reaches the hinge zone when the dip suddenly increases to 15 to 20 degrees and the sedimentary units plunge to a great depth into the deep geosynclinal basin to the southeast. The detailed geologic patterns are shown in Figure IV.18.

e) Soil

260. Rangpur division falls four different soil formation zones). The general soil types of the Rangpur division predominantly include Non-calcareous Dark Grey & Grey Floodplain Soils, Non-calcareous Brown Floodplain soils, Deep Red Brown Terrace Soils

Non-calcareous Dark Grey & Grey Floodplain Soils occur extensively on the Old Brahmaputra and old Meghna estuarine floodplain. The majority of these soils are Eutric Gleysols.

261. Non-calcareous Brown Floodplain soils occur largely on the Old Himalayan Piedmont Plain, mostly on the ridges. They also occupy minor areas in the Tista, Karatoya-Bangali, Jamuna, and Old Brahmaputra floodplains, and in some western parts of the Ganges floodplain.

262. Deep Red Brown Terrace Soils occur extensively in the northeastern Barind Tract, on the Madhupur Tract and the Akhaura Terrace.

f) Ambient Air Quality

263. The baseline air quality testing was performed at three (03) project locations in Rangpur division as per DoE and international standards & the digital equipment's were used for air quality monitoring (Figure IV.33). The monitored parameters were CO, O_3, NO_x, SO_2, $PM_{2.5}$ and PM_{10}. Oceanus Portable Gas Detector OC-905 was used to measure SO2, NOX, and CO. Oceanus Portable Gas Detector OC-300 measured $PM_{2.5}$ & PM_{10} of gaseous pollutants. All the locations of sample collections are summarized in Table IV-20. Electro-Chemical Sensor devices were calibrated before testing the relevant parameters. Results of the air quality monitoring at the subproject locations have been shown in Table IV 16. The sample site descriptions are provided in Table IV-25. The laboratory test result is given in Appendix A of the report.

Vill: Namuri; Upz:Polashi; Dist: Lalmonirhat
Kur-Lalmoni PBS

Proposed Birol Substation; Dist: Dinajpur
Dinajpur PBS-1

Vill: Mirbag, Kawnia; Upz:Kursha; Dist: Rangpur
Rangpur PBS-2

Figure IV.43: Ambient Air Quality Sampling in the Project Area

Table IV-25: Test Result of Ambient Air Quality Analysis

Location	GPS Location	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_x ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	CO (ppm)	O_3 ($\mu g/m^3$)
		AEROQUAL Series 500 Particulate matter monitors		AEROQUAL Series 500 NOx monitor	AEROQUAL Series 500 SOx monitor	CO Meter	O_3 Meter
Modonpur, Namuri, Polashi, Lalmonirhat	N-25.933843° E-89.312927°	54.34	47.87	12.45	2.78	0.86	15.78
Mirbag, Kawria, Rangpur	N-25.760847° E-89.361374°	54.56	43.62	7.35	7.61	0.39	9.78
Birol, Dinajpur	N-25.585834° E-88.542576°	76.32	53.63	11.85	5.86	0.75	12.67
Weather Condition	Mostly Sunny						
Standard for Ambient Air Quality according to DoE, Bangladesh		**150**	**65**	**100**	**365**	**9**	**157**
Standard for Ambient Air Quality according to WHO guidelines, 2022		**-**	**-**	**-**	**500**	**10**	**100**

Table IV-26: Description of the surrounding environment

Location	Sample Site Description
Modonpur, Namuri, Polashi, Lalmonirhat	➢ The weather was sunny. ➢ Visible dust particles were moderate. ➢ Traffic movement was high. ➢ People's movement was low. ➢ Beside Tista-Patgram Highway. ➢ No sensitive receptor was found within the 500m buffer zone during our survey.
Mirbag, Kawrnia, Rangpur	➢ The weather was sunny. ➢ Visible dust particles were moderate. ➢ Traffic movement was high. ➢ People's movement was moderate. ➢ Beside Rangpur-Lalmonirhat Highway. ➢ Vegetation covers were moderate. ➢ No sensitive receptor was found within the 500m buffer zone during our survey.
Birol, Dinajpur	➢ The weather was sunny during the monitoring period. ➢ Visible dust particles were moderate. ➢ Traffic movement was moderate. ➢ People's movement was low. ➢ No sensitive receptor was found within the 500m buffer zone during our survey.

264. From the assessment of the ambient air quality of the project area it has been anticipated that all the parameters are within national standard according to the ECR-97.

g) Noise level

265. Baseline Noise Level Measurement was analyzed from project boundaries at three (03) specific locations in Rangpur division from 26 October 2021 to 08 November 2021 (figure IV.44). Results of the noise level monitored at the sampling locations have been shown in Table IV-22.

Vill: Namuri; Upz:Polashi; Dist: Lalmonirhat
Kur-Lalmoni PBS

Proposed Birol Substation; Dist: Dinajpur
Dinajpur PBS-1

Vill: Mirbag, Kawnia; Upz:Kursha; Dist: Rangpur
Rangpur PBS-2

Figure IV.44: Noise Level Measurement in the Project Area

Table IV-27: Results of Noise Level Measurement

Sample ID	Location	GPS Location	Land Use Category	Measurement Time		Noise Level
				Day		Day
				Start	End	
NM_02	Modonpur, Namuri, Polashi, Lalmonirhat	N-25.933830° E-89.313060°	Residential	03:20 pm	03:50 pm	64.52
NM_03	Mirbag, Kawria, Rangpur	N-25.760949° E-89.361476°	Residential	03:03 pm	03:33 pm	68.16
NM_04	Birol, Dinajpur	N-25.585834° E-88.542576°	Residential	12:15 pm	12:45 pm	57.91

Notes

- *Land use category is based on the classification provided in the Noise Pollution Control Rules (2006).*
- *The sound level standard for the Residential area at daytime is 55 dBA, and nighttime is 45 dBA.*
- *The sound level standard for the mixed areas at daytime is 60 dBA and nighttime is 50 dBA.*
- *Noise level is the average noise recorded over the duration of the monitoring period.*
- *According to IFC EHS guidelines, sound level standard for the Residential, institutional, and educational area at daytime is 55 dBA, and nighttime is 45 dBA.*
- *According to IFC EHS guidelines, sound level standard for the industrial and commercial area at daytime is 70 dBA, and nighttime is 70 dBA*

Table IV-28: Description of the surrounding environment

Location	Sample Site Description
Modonpur, Namuri, Polashi, Lalmonirhat	➢ Traffic movement was high. ➢ People's movement was moderate. ➢ Beside Lalmonirhat-Patgram highway. ➢ No sensitive receptor was found within the 500m buffer zone during our survey.
Mirbag, Kawria, Rangpur	➢ Traffic movement was high. ➢ People's movement was low. ➢ Beside Lalmonirhat-Kurigram highway. ➢ No sensitive receptor was found within the 500m buffer zone during our survey.
Birol, Dinajpur	➢ Traffic movement was moderate. ➢ People's movement was low. ➢ Some construction activities were noticed surroundings the project area. ➢ No sensitive receptor was found within the 500m buffer zone during our survey.

The result table shows that the time-weighted average value of the sound monitoring in the sampling locations is within the national standard set for residential areas except for (Mirbag, Kawria, Rangpur), (Birol, Dinajpur) & (. Alipur, Gurdaspur, Natore). The main reason behind the excessive noise is most of the area is situated beside the highway and few construction activities are also responsible. Noise impacts should not exceed the levels stated or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site. In general, the noise level limit is represented by the background or ambient noise levels that would be present in the absence of the facility or noise source(s) under investigation (IFC EHS Guidelines 2007.

h) Water Resources and Hydrology

266. Water Resources of Bangladesh is endowed with plenty of surface and groundwater resources. The surface water resources comprise water available from flowing rivers and static water bodies as ponds, beels and haors.

(i) Surface Water

267. Surface water originates mostly from rainfall and is a mixture of surface run-off and ground water. It includes larges rivers, ponds and lakes, and the small upland streams which may originate from springs and collect the run-off from the watersheds.

268. In the Project areas, there are so many water bodies. Main rivers: brahmaputra, jamuna, punarbhaba, karatoya, atrai, tista, mahananda. The biggest irrigation project of the country, the Tista Barrage Project (length 615 m) is located at Doani of Hatibandha upazila.

269. Bangladesh and the western portion of the Indian State of Bengal are located within the 'Bengal Basin'. According to Rahman et al (2003), this basin includes the world's largest river delta, which occupies some 140,000sq km (the Ganges-Padma, Jumna-Brahmaputra-Tista and Meghna rivers and numerous tributary complexes), as well as the world's largest submarine fan complex (the Bengal Fan). These river systems have a combined annual sediment load of 1.5 to 2.4 billion metric tons per year (Rahman et al, 2003).

270. Teesta River, Dharla River, and Brahmaputra River are major navigation routes crossing the project area. This route is extensively used for the transportation of goods and people. Local people use small boats and trawlers for local transportation of goods and other vessels like ships, barges, and cargo for transportation across the country through these rivers.

271. The surface water samples were collected from 03 (three) locations in Rangpur division between 26 October 2021 to 08 November 2021 covering a total of 11 parameters. The following surface water quality has been collected from nearest water bodies of proposed substation's location. The reason for choosing the waterbodies is if any construction yard or labor camp established near the water body during the construction period, the water body may be contaminated. Another reason for choosing the location was, during our survey in 2021 the rivers crossing tower location were not finalized. The locations with detailed addresses are summarized in Table IV-20. The parameters measured were pH, Turbidity, Temperature, ORP, Electric Conductivity (EC), COD, BOD_5, TDS, DO, Sulphates. EZDO 8200 was used to conduct pH, TDS, EC, and temperature tests. Lutron DO-5509 was used to conduct the test of Dissolved Oxygen (DO).

*OFFICIAL USE ONLY


Birol, Dinajpur


Vill: Namuri; Upz:Polashi; Dist: Lalmonirhat, Kur-Lalmoni PBS


Vill: Mirbag, Kawnia; Upz:Kursha; Dist: Rangpur, Rangpur PBS-2

Figure IV.45: Sampling of Surface Water in the Project Area

Table IV-29: Test Results of Surface Water Analysis

Parameters	Unit	SW-02	SW_03	SW_04	Standards for Surface Water (best practice for fishing) by ECR'97	Analysis Method
		Modonpur, Polashi, Lalmonirhat	Mirbag, Kawnia, Rangpur	Birol, Dinajpur		
		N-25.933311 E-89.311384	N-25.760903 E-89.361700	N-25.584910 E-88.545670		
pH*	-	7.8	6.20	6.65	6.5-8.5	Multimeter
Total Dissolved Solids (TDS)*	mg/L	150	146	114.9	NYS	Multimeter
ORP*	mV	-332	75.5	-89.6	NYS	Multimeter
Electric Conductivity (EC)*	µs/cm	238	227	195.2	NYS	Multimeter

*OFFICIAL USE ONLY

Parameters	Unit	SW-02	SW_03	SW_04	Standards for Surface Water (best practice for fishing) by ECR'97	Analysis Method
		Modonpur, Polashi, Lalmonirhat	Mirbag, Kawnia, Rangpur	Birol, Dinajpur		
		N-25.933311 E-89.311384	N-25.760903 E-89.361700	N-25.584910 E-88.545670		
Temperature*	°F	30.5	29.5	29.7	-	Multimeter
Salinity*	mg/L	113	110	83.5	-	-
BOD	mg/L	11	9	10	0.2	5 days incubation
COD	mg/L	40	36	36	4.0	CRM
Turbidity	NTU	43.4	6.2	29.5	10	Turbidity meter
Phosphate	mg/L	0.32	0.27	0.91	6.0	UVS

(ii) Ground Water

272. Groundwater is an important part of the water cycle. Groundwater is the part of precipitation that seeps down through the soil until it reaches rock material that is saturated with water. Water in the ground is stored in the spaces between rock particles (no, there are no underground rivers or lakes). Groundwater slowly moves underground, generally at a downward angle (because of gravity), and may eventually seep into streams, lakes, and oceans.

273. About 60% of Rangpur inhabitants use groundwater for drinking and residential reasons. Therefore, groundwater has become the prime source of irrigation in the dry period. About 70 percent of irrigation water and 90 percent of total potable water in Bangladesh are supplied from a groundwater source. The toxicity or suitability of groundwater is determined by varying amounts and different species of ions. The usual toxic elements in irrigation water are chlorine, boron and sodium. The depth of wells was between 220 to 330 feet and was commissioned during 1970-1980. On the other hand. The levels of arsenic in groundwater in Bangladesh are considered to be some of the highest in the world (Smith et al 2000). At present, the occurrence of Arsenic in drinking water has been identified in 272 Upazilas under 61 Districts of the country (DPHE, 2009). The World Health Organization (WHO) has defined the tolerance limit of arsenic for drinking water as 0.01mg/L while the Bangladesh standard for arsenic in drinking water is 0.05mg/L. Strategic groundwater (GW) management is the continuous planning, monitoring, analysis and assessment of all that is necessary to make the best use of ground water in a sustainable way.

274. Groundwater samples were collected from Three (03) sampling locations in Rangpur division along the project corridor from 26 October 2021 to 08 November 2021. The locations with detailed addresses are summarized in (Table IV-30). A total of 12 Parameters were tested. All samples were collected with Kemmerer Bottle and then transferred into 1 litre plastic sampling bottles. The sampling bottles were washed by distilled water before sample collection. The sampling bottles were then kept in an ice cooler. Safety vests, hand Gloves and helmets were used during the surface water samples collection. EZDO 8200 Multimeter (Figure IV-6) was used to conduct the on-site test of pH, Total Dissolved Solids (TDS), Electronic Conductivity (EC) and Temperature. Lutron DO-5509 was used to conduct the on-site test of Dissolved Oxygen (DO). Collected samples were then sent to the Department of Public Health Engineering (DPHE) for analysis of remaining Parameters.

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Birol, Dinajpur


Vill: Namuri; Upz:Polashi; Dist: Lalmonirhat
Kur-Lalmoni PBS


Vill: Mirbag, Kawnia; Upz:Kursha; Dist: Rangpur
Rangpur PBS-2

Figure IV.46: Sampling of Groundwater in the Project Area

Table IV-30: Test Results of Groundwater Analysis

Parameter	Unit	GW_02 Modonpur, Polashi, Lalmonirhat N-25.933803 E-89.311287	GW_03 Mirbag, Kawnia, Rangpur N-25.760756 E-89.361436	GW_04 Birol, Dinajpur N-25.586075 E-88.542650	Standards for potable water*	Standard for potable water according to WHO	Method of Analysis
pH*	-	6.9	6.46	7.91	6.5-8.5	NYS	Multimeter
Total Dissolved Solids (TDS)*	mg/L	165	170	183	1000	NYS	Multimeter
ORP*	mV	-294	16.2	15.9	NYS	NYS	Multimeter

*OFFICIAL USE ONLY

Parameter	Unit	GW_02 Modonpur, Polashi, Lalmonirhat N-25.933803 E-89.311287	GW_03 Mirbag, Kawnia, Rangpur N-25.760756 E-89.361436	GW_04 Birol, Dinajpur N-25.586075 E-88.542650	Standards for potable water*	Standard for potable water according to WHO	Method of Analysis
Electric Conductivity (EC)*	µs/cm	252	259	289	NYS	NYS	Multimeter
Temperature*	°C	26.2	27.0	29.1	NYS	NYS	Multimeter
Hardness (as CaCO3)	NTU	120	145	125	10	5	Turbidity meter
Chloride	mg/L	30	15	15	0.05	0.01	AAS
Turbidity	mg/L	1.2	11.3	2.1	0.3-1	0.3	AAS
Arsenic	mg/L	0.001	0.001	0.001	200-500	300	Calmagite Method
Iron	mg/L	0.27	1.57	0.32	150-600	250	Titrimetric
Total Suspended Solid (TSS)	mg/L	1	2	1	NYS	5	Gravimetric Method

i) Natural Hazards

275. Natural hazard events can be characterized by their magnitude or intensity, speed of onset, duration, and the area they cover. Hazards occur at different intensities (or magnitudes) over different time scales (sometimes known as temporal scales). The occurrence of hazards of different intensities in terms of probabilities or return periods, within the context of uncertainty. In general, the longer the return period the greater the intensity of the hazard. Because of these long return periods, some communities may have no memory of the potential threat of a high intensity hazard.

276. Natural hazards are naturally occurring physical phenomena. They can be: Geophysical: a hazard originating from solid earth (such as earthquakes, landslides and volcanic activity) Hydrological: caused by the occurrence, movement and distribution of water on earth (such as floods and avalanches).

(i) Seismicity

277. Bangladesh is situated in one of the most tectonically active regions in the world where three major plates meet (the Indian Plate, the Tibet Sub-Plate, and the Burmese Sub-Plate). The project area is located over the Indian Plate, which is moving north. However, due to the location of relevant plates, fault lines and hinge zones, Bangladesh itself is divided into four seismic zones based on the ranges of the seismic coefficient (note: the seismic coefficient is a measure of how strong an earthquake has the potential to be based on a combination of the mass of the plate and the seismic forces acting on it, as well as how frequently these quakes are likely to occur). As per the seismic zone classifications (Figure IV.19), the subproject areas within the Rangpur division fall both in Zone II and Zone III means medium seismic intensity.

(ii) Flood

278. Flood is a recurrent phenomenon in Bangladesh. Every year near about one-fifth of Bangladesh undergoes flood during the monsoon season. A flood season in Bangladesh may start as early as May and can continue until November. Floods of Bangladesh can be divided into three categories:

279. The project areas are located in low river flooding, moderate river flooding, moderate tidal surge, and severe tidal surge areas. Floods have a devastating impact on the displaced population. Majority of people have been moving from one place to another. They tend to have

experienced changes in their lifestyle with intensity and number of incidences of disaster events. It was clear that households cope differently when affected by this disaster. Communities should be encouraged to build houses using durable materials and away from the disaster-prone area as a way of coping with this disaster. The project area and their risk of the flood are shown in (Figure IV.26).

280. The Flood Forecasting and Warning Centre (FFWC), under the Bangladesh Water Development Board (BWDB), provides real-time data on water levels and flood forecasts. Here are some water levels and danger levels for various rivers in the Rangpur division.

- Panchagarh District: Panchagarh
- Pankha River: Water Level 10.23 m, Danger Level 22.05 m
- Phulbari River: Water Level 24.80 m, Danger Level 29.50 m

2. Biological Environment

a) Bio-ecological Zones

281. Within a relatively small geographic boundary, Bangladesh enjoys a diverse array of ecosystems. Being a low-lying deltaic country, seasonal variation in water availability is the major factor, which generates different ecological scenarios of Bangladesh. Temperature, rainfall, physiographic variations in soil and different hydrological conditions play vital roles in the country's diverse ecosystems. The ecosystems of Bangladesh could be categorized into two major groups, i.e. (i) land based and (ii) aquatic. The land-based ecosystems include forest and hill ecosystems, agro-ecosystems and homestead ecosystems; while seasonal and perennial wetlands, rivers, lakes, coastal mangroves, coastal mudflats and chars, and marine ecosystems fall into the aquatic category.

282. Each of the ecosystems has many sub-units with distinct characteristics as well. IUCN Bangladesh in 2002 classified the country into twenty-five bio-ecological zones. The subproject areas within the Rangpur division fall below the bio-ecological zone (Figure IV-27).

b) Biodiversity

283. In and around the subprojects area some wildlife species were identified as locally vulnerable. The name of these vulnerable species is Bengal monitor, Rat snake, Common vine snake, Crested Serpent-eagle, Yellow-footed green pigeon, Common mongoose, Bengal fox, Small Indian Civet. Some species were also identified as locally endangered and these are Ring lizard, Monocellate cobra, and Jungle cat. Any construction must consider impacts on the rate of deforestation, loss of habitat, habitat fragmentation, and interruption of wildlife migration patterns.

c) Diversity of Floral and Faunal Species

284. The project area has some flora of commercial importance. The major tree species found in the area are Mahogany, Betel nut, Rain-tree and (in Bengali and colloquial) Simul, Sishu, Arjun, Minjiri, Jarul, Hizal, Sheora, Krishnachura Chambal, Kadam, Royna, Koroi, Shilkoroi, Debdaru, Bot, Eucalyptus, Shilkoroi, Siris etc. No endangered floral species are reported. The dominant fruit-bearing trees include Mango, Jackfruit, Banana, Guava, Pine apple, Date, Palm, Coconut, Papaya etc. Besides domestic animals, wild dogs, jungle cat, jackal, mongoose and rodents like ants and snakes of various species are reported, though having a decreasing trend. The endangered animals like Wild cow, Wild Buffalo, Peafowl, Mugger Crocodile etc. are not reported. Mamma species like Monkey, Squirrel, Forest cat, Mongoose are available to a lesser extent. Amphibians including Kola bang, Gecho bang and Sona bang are also found to fewer extent. Some birds found in common having Bangla names Chorui, Doel, Holudpakhi, Chil, Dahuk, Babui, Koel, Kath thokra, Ghugu, Shalik, Chil, Pecha, Tia, Bok, Kak, Tuntuni, Bulbuli, Kokil etc.

285. A large number of fruit, timber, fuel, and medicinal trees of economic worth have been found in SPIA zones. These trees provide homes for birds and other wildlife. The plant community consists of low-growing grass, herbs, shrubs, and trees. A detailed list of floral species found in SPIA is shown in Table IV.31.

Table IV-31: Terrestrial Flora available in the SPIA

Scientific Name	Local Name (English Name)	Habit	Habitat	Status
• **Timber/Wood Trees**				
Albizzia procera	Koroi	T	RS, HS	C
Eucalyptus citriodora	U-caliptas	T	RS, HS	LC
Dalbergia sisoo	Shishu	T	RS, HS	C
Bambosa spp.	Bash (Bamboo)	S	HS	C
Samanea saman	Raintree	T	RS, HS	C
Bombax ceiba	Shimul (Cotton Tree)	T	RS, HS	LC
Polyalthia longifolia	Debdaru	T	RS	LC
Acacia aurculiformios	Akashmoni	T	RS, HS	C
Tectona grandis	Shegun	T	RS, HS	LC
Teominalia arjunna	Arjun	T	HS,RS	LC
• **Fruit Trees**				
Zizyphusm auritiana	Boroi	T	HS	LC
Citrus grandis	Jambura/Badam	S	HS	C
Aegle marmelos	Bel	T	HS	C
Feronia limonia	Kodbel	T	HS	LC
Phoenix sylvestris	Date Tree (Khejur)	T	HS,RS	C
Areca catechu	Supari (Betel Nut/Nut)	T	HS	C
Carica papaya	Pepe (Papya)	T	HS	C
Citrus aurantifolia	Labu (Lemon)	S	HS	C
Averrhoa carambola	Kamranga	T	HS	C
Punica granatum	Dalim	S	HS	LC
Manilkara sapota	Sobeda	T	HS	LC
Dellenia indica	Chalta	T	HS	LC
• **Fruit cum Timer Trees**				
Syzygiumcumini	Jam(Blackberry)	T	HS	C
Tamerindusindica	Tetul (Tamarind)	T	HS	C
Borassusflabellifer	Tal (Palm Tree)	T	RS	LC
Elaeocarpus robustus	Jolpai (Olive)	T	HS	LC
Diospyros peregrina	Gub	T	HS,RS	LC
• **Medicinal Trees**				
Azadirachta indica	Neem	T	HS	C
Teominalia arjunna	Arjun	T	HS,RS	LC
Ocimum canum	Tulshi	H	HS	LC
Coccinea cordifolia	Telakachu	S	HS	C
• **Fuel Trees**				
Acacia nilotica	Babla	T	HS	C
Ricinus communes	Venna	T	HS	C
Lannea coromandelica	Ziga	T	HS, RS	C
	Shewra	T	HS	C
	Bakul	T	HS	LC
• **Aesthetic**				
Delonix regia	Krisnochura	T	HS	LC
Cassia fistula	Sonalu	T	HS	LC
Codiaeum variegatum	Patabahar	S	HS	LC
Lawsenia inermis	Mehendi	S	HS	C

Source: *Field level survey, 2021.* ***Note:*** *C-Common, LC- Less Common, UC- Uncommon, CU- Cultivated Habit: T=Tree, H= Herb, S=Shrub, G=Grass; Habitat: HS=Homestead, RS-Road side*

286. The reproduction, breeding and multiplication of aquatic fishes are very finely tuned and adjusted to the rhythm and amplitude of monsoon flooding in and around the proposed

cluster. There are many fishermen within the cluster whose income source is mainly fishing from the haor and beel as well as natural canals.

287. Pankauri (Indian Cormorant), Dhushor Bok (Grey Heron), Maachranga (Kingfisher) and Gangchil (Gull-billeded Tern) are the birds commonly found during field visit in the subproject areas. Leaving aside the other common birds like crows, sparrows, shaliks, cuckoos etc. and some domestic cattle, no other wild animals inhabit the area. The wildlife that fully depends on the terrestrial land throughout their whole life, their existence, shelter, food, nesting, breeding and also producing own offspring is called terrestrial fauna. Core components of the terrestrial fauna are amphibians, reptiles, birds and mammals.

288. A number of avian species were observed in the area. These species are typical inhabitants of urban fringes and considered common both at local and regional levels. In addition to the avian species, the area is habitat to a variety of reptiles, mammals and invertebrates. These include foxes, rodents, snakes, etc. A detailed list of faunal species found in the subproject area is presented in Table IV-32.

289. The diversified habitat and ecosystem in the project area support various types of wildlife as given in Table IV-32 Most of the faunal species such as (Avians, Amphibians, Reptiles and Mammals) were identified in the SPIA by using books and description of the local people during the field survey which are given in the following Table IV-32.

Table IV-32: List of Faunal Species Available in the SPIA

Scientific Name	English Name	Local Name	Local Status
Bufo melanostictus	Common Toad	Kuno bang	NO
Rana temporalis	Bull Frog	Kola bang	NO
R. pipens	Grass Frog	Sona bang	NO
Class: Reptilia			
Varanus salvaToR	Ring lizard	Kalo gui	EN
Xenochrophis piscaToR	Checkered keelback	Dhora shap	NO
Coluber mucosus	Rat snake	Daraj shap	VU
Ahaetulla nasutus	Common vine snake	Laodoga shap	VU
Atretium schistosum	Olive keelback	Maitta shap	NO
Naja naja	Monocellate cobra/ Spectacled cobra	Khoia gokhra	EN
Class: Aves			
Ardeola grayii	Indian pond heron	Kani bok	NO
Casmerodius albus	Great egret	Sada bok	NO
Egretta intermedia	Intermediate egret	Mazla bok	NO
Egretta garzetta	Little egret	Choto bok	NO
Nycticorax nycticorax	Black-crowned night heron	Nishi bok	NO
Ixobrychus cinnamomeus	Cinnamon Bittern	Lal bok	NO
Anastomus oscitans	Asian Openbill	Shamuk-khol	NO
Haliastur indus	Brahminy kite	Shankho chil	NO
Milvus migrans	Black kite	Bhubon chil	NO
Actitis hypoleucos	Common sandpiper	Kada Khocha	--
Streptopelia chinensis	Spotted dove	Tila Ghughu	NO
Streptopelia decaocto	Eurasian collared dove	Raj Ghughu	NO
Psittacula krameri	Rose-ringed parakeet	Tia	NO
Amaurornis phoenicurus	White-breasted waterhen	Dahuk	NO
Eudynamys scolopacea	Asian cuckoo	Kokil	NO
Centropus sinensis	Greater coucal	Kanakua	NO
Cuculus micropterus	Indian cuckoo	Bou-kotha-kao Pakhi	NO
Athene brama	Spotted owlet	Khuruley Pencha	NO
Alcedo atthis	Common kingfisher	Choto Maachranga	NO
Halcyon smyrnensis	White-throated kingfisher	Sada buk Maachranga	NO
Ceryle rudis	Pied kingfisher	Pakra Maachranga	NO
Megalaima haemacephala	Coppersmith barbet	Choto Basanta Bauri	NO
Oriolus xanthornus	Black-headed oriole	Holdey Pakhi	NO

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Scientific Name	English Name	Local Name	Local Status
Corvus splendens	House crow	Pati Kak	NO
Dicrurus macrocercus	Black drongo	Fingey	NO
Copsychus saularis	Oriental magpie robin	Doel	NO
Acridotheres fuscus	Jungle myna	Jhuti Shalik	NO
A. tristis	Common myna	Bath Shalik	NO
A. ginginianus	Bank myna	Gang Shalik	NO
Sturnus contra	Asian pied starling	GoBrey Shalik	NO
S. malabaricus	Chestnut-tailed starling	Kath Shalik	NO
Pycnonotus cafer	Red-vented bulbul	Bulbuli	NO
Turdoides striatus	Jungle babbler	Satbhai	NO
Orthotomus suToRius	Common tailorbird	Tuntuni	NO
Passer domesticus	House sparrow	Charui	NO
Ploceus philippinus	Baya weaver	Babui	NO
Upupa epops	Eurasian Hoopoe	Hudhud Pahkhi	
Class: Mammalia			
Pteropus giganteus	Flying Fox	Badur	VU
Pipistrellus coromandra	Indian Pipistrelle	--	EN
Megaderma lyra	Greater False Vampire	Badur	NO
Herpestes edwarsi	Common Mongoose	Bara benji	EN
H. auropunctatus	Small Indian Mongoose	Benji	NO
Vulpes bengalensis	Bengal Fox	Khek shial	VU
Rattus rattus	Common House Rat	Indur	NO
Bandicota indica	Bandicoot Rat	Bara indur	NO
B. bengalensis	Lesser Bandicoot Rat	Indur	NO
Mus musculus	House Mouse	Nengri indur	NO
Suncus murinus	House Shrew	Chicka	NO

Source: Baseline Environmental Survey, 2021 and Literature Review and IUCN Red Data Book (2015). Notes: EN – Endangered, VU – Vulnerable, NO – Not Threatened

Table IV-33: Common Fish Species in the SPIA

Sl. No.	Local Name	Scientific Name	English Name	Local Status
1	Tengra	*Batasio batasio*	Tista Batasio	NO
2	Pabda	*Ompok pabo*	Pabo catfish	EN
3	Puti	*Puntius sophore*	Spotfin Swamp Barb	NO
4	Darkina	*Esomus danricus*	Flying barb	DD
5	Dhela	*Osteobrama cotio*	Cotio	EN
6	Chela	*Salmostoma acinaces*	Silver Razorbelly Minnow	DD
9	Mrigal	*Cirrhinus mrigala*	Mrigal	NO
10	Boyal	*Wallago attu*	Freshwater	NO
11	Pungus	*Pangasius pangasius*	Pungas	CR
12	Elish	*Tenualosa ilisha*	Hilsha	NO
13	Foli	*Notopterus notopterus*	Grey featherback	VU
14	Koi	*Anodontosoma chachunda*	Chachunda	NO
15	Mola	*Amblypharyngodon mola*	Pale carplet	NO
16	Chapila	*Gonialosa manmina*	Ganges River	NO
17	Baim	*Mactacembalus armatus*	Tire truck spineel	EN
18	Gajar	*Channa marulius*	Giant snakehead	EN
Note: EN= Endangered, VU= Vulnerable, CR= Critically Endangered, NO= Not Threatened, DD= Data Deficiet				

Source: Baseline Environmental Survey, 2021 and Literature Review and IUCN Red Data Book (2015)

3. Socio-economic Environment

290. It is essential for every development project, whether small or large, to understand the social, human and economic aspects of the primary stakeholders, i.e., people living in and around the project site. The following tools and techniques were used to collect the relevant data/information on the social and economic aspects of affected people:

- Literature review;
- Group discussion; and
- Informal meetings with various professionals.

291. In addition, data obtained from secondary sources were compared with the primary data/information gathered during the study.

292. Data on population, age/sex composition, household patterns, and sources of drinking water, sanitation facility, and ownership of agricultural land were enumerated from the latest community series census published by the Bangladesh Bureau of Statistics (BBS).

a) Administrative Structure

293. The Project consists of several components under Eight PBSs of eight districts within Rangpur division of Bangladesh. The study area covers 58 Upazilas and 536 unions as presented in Table IV-34.

Table IV-34: Administrative areas under 8 PBS

District	Upazila/ Thana/ City Corporation/ Pourashava	Union
Dinajpur	Birampur	7
	Birganj	11
	Biral	10
	Bochaganj	6
	Chirirbandar	12
	Phulbari	7
	Ghoraghat	4
	Hakimpur	3
	Kaharole	6
	Khansama	6
	Dinajpur Sadar	10
	Nawabganj	9
	Parbatipur	10
Subtotal	**13**	**101**
Gaibandha	Phulchhari	7
	Gaibandha	13
	Gobindaganj	17
	Palashbari	9
	Sadullapaur	11
	Sughatta	10
	Sundarganj	15
Subtotal	**7**	**82**
Kurigram	Bhurungamari	10
	Char Rajibpur	3
	Chilmari	6
	Phulbari	6
	Kurigram Sadar	8
	Nageshwari	15
	Rajarhat	7
	Raomari	5
	Ulipur	13
Subtotal	**9**	**73**
Lalmonirhat	Aditmari	8
	Hatibandha	10
	Kaliganj	8
	Lalmonirhat Sadar	9

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District	Upazila/ Thana/ City Corporation/ Pourashava	Union
	Patgram	7
Subtotal	**5**	**42**
Nilphamari	Dimla	10
	Domar	10
	Jaldhaka	12
	Kishoreganj	9
	Nilphamari Sadar	15
	Saidpur	5
Subtotal	**6**	**61**
Panchagarh	Atwari	6
	Boda	10
	Debiganj	10
	Panchagarh Sadar	10
	Tetulia	7
Subtotal	**5**	**43**
Rangpur	Badarganj	10
	Gangachara	10
	Kaunia	6
	Mithapukur	17
	Pirgachha	9
	Rangpur Sadar	11
	Pirganj	15
	Taraganj	5
Subtotal	**8**	**83**
Thakurgaon	Baliadangi	8
	Haripur	6
	Pirganj	10
	Ranisankail	8
	Thakurgaon Sadar	19
Subtotal	**5**	**51**
Total	**58**	**536**

b) Quality of Life Indicator

(i) Population & Households

294. The average sex ratio among all districts is 99.8. Population densities in Bangladesh are relatively high throughout the country. Panchagarh district has the lowest population density in the project area and Rangpur district has the highest with more than 1,200 persons per km^2.

Table IV-35: Demographic Characteristics of the Study Area

District	Household	Population	Male	Female	Sex Ratio	Area (km^2)	Persons/ (km^2)
Dinajpur	716,800	2,990,128	1,508,670	1,481,458	101.9	3,444	997.7
Gaibandha	608,700	2,430,627	1,169,127	1,210,128	96.6	2,179	1,125
Kurigram	507,300	2,069,273	1,010,442	1,058,831	95.5	2,245	921.7
Lalmonirhat	290,800	1,256,099	628,799	627,300	100.2	1,247	1,007
Nilphamari	421,100	1,907,497	922,964	911,267	101.5	1,64	1,186
Panchagarh	228,100	987,644	496,725	490,919	101.4	1,405	703.1
Rangpur	721,600	2,996,336	1,443,816	1,437,270	100.5	2,401	1,200
Thakurgaon	320,900	1,390,042	701,281	688,761	101.9	1,782	780.2

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District	Household	Population	Male	Female	Sex Ratio	Area (km^2)	Persons/ (km^2)
Rangpur division	3,815,500	15,787,758	7,881,824	7,905,934	99.8	16,317	1,156

(ii) Religion

295. According to the population and housing census (2011), the population of the project areas is dominated by the Muslim community constituting almost 89.39% of the total population. The remaining 10.61% is primarily constituted by Hindus with Christians, Buddhists and others comprising an insignificant percentage.

Table IV-36: Religious Profile of the Study Area

District	Total Population	Muslim	Hindu	Christian	Buddhist	Others
Dinajpur	2,990,128	85.84	12.01	1.25	0.01	0.89
Gaibandha	2,430,627	88.51	11.44	0.02	0.00	0.03
Kurigram	2,069,273	92.99	6.96	0.02	0.00	0.03
Lalmonirhat	1,256,099	85.94	13.86	0.20	0.00	0.00
Nilphamari	1,907,497	89.65	10.09	0.17	0.01	0.08
Panchagarh	987,644	89.63	9.91	0.38	0.00	0.08
Rangpur	2,996,336	92.01	7.67	0.06	0.17	0.09
Thakurgaon	1,390,042	88.23	10.93	0.29	0.07	0.48
Rangpur division	15,787,758	89.39	9.93	0.36	0.04	0.27

(iii) Age Structure of the Project Area

296. Population and Housing census (2011) shows that age structure in the project area covers 24% of the total population are children (ages up to 9 years) and 19% are young (10 to 19 years), 50% of working-age i.e., between 20 to 59 years, which is considered as the active workforce. Table IV-37 Shows the population distribution by different age groups in the project area.

Table IV-37: Age structure of the Study Area

District	Percentage of Population in Each Age Group (%)								
	0-9	10–19	20-29	30-39	40-49	50-59	60-69	70-79	80+
Dinajpur	22%	19%	18%	15%	11%	7%	4%	2%	1%
Gaibandha	24%	18%	18%	14%	11%	7%	5%	2%	1%
Kurigram	24%	19%	17%	14%	10%	7%	4%	2%	1%
Lalmonirhat	25%	20%	17%	14%	10%	7%	4%	2%	1%
Nilphamari	25%	20%	17%	14%	10%	6%	4%	2%	1%
Panchagarh	24%	20%	18%	14%	10%	6%	4%	2%	1%
Rangpur	22%	19%	18%	15%	11%	7%	4%	2%	1%
Thakurgaon	23%	20%	18%	15%	11%	6%	4%	2%	1%
Rangpur division	24%	19%	18%	14%	11%	7%	4%	2%	1%

(iv)Literacy

297. The literacy rate for the population 7 years and above in the project area is 64.79%, which is higher than the national literacy rate of 58.77%. Similarly, male literacy rate in the project area is higher than the national literacy rate whereas female literacy rate in the project area is lower than that of the country as a whole. Panchagarh district shows the highest literacy rates at 68.36% for males and 64.79% for females, while Kurigram has the lowest rates at 52.66% for males and 48.74% for females.

Table IV-38: Literacy Rates by Each District in the Project Area

District	Total Literacy		Male Literacy		Female Literacy	
	Total Population	% of Total Literate	Total Male Population	% of Males Literate	Total Female Population	% of Females Literate
Dinajpur	2006347	66.96	1412869	70.42	1270820	63.34
Gaibandha	1798263	60.14	1146033	63.73	1017457	56.58
Kurigram	1089679	52.66	617521	56.67	531110	48.74
Lalmonirhat	1136296	59.57	717116	63.11	636212	55.99
Nilphamari	1422889	58.54	880484	61.88	783870	55.09
Panchagarh	950233	68.36	682837	71.86	615656	64.79
Rangpur	647796	65.59	448275	69.20	400273	61.79
Thakurgaon	813827	64.79	559913	68.80	493098	60.59
Rangpur division	10228888	64.79	6729586	65.79	5967533	58.34

(v) Occupations & Livelihood

298. According to the Population and Housing Census of Bangladesh (2011), approximately 10% males aged 7 years old and above of total population in the study area are employed whereas 1.6% of males have no work. Almost 11.1% of females are involved in household work.

Table IV-39: Occupation and Livelihood in the Project Area

District	Total Population	Employed	Looking for work	Household work	Do not work
Dinajpur	2,990,128	914,285	15,940	825,666	790,989
Gaibandha	2,430,627	663,421	15,291	693,407	618,937
Kurigram	2,069,273	564,481	12,631	594,391	556,747
Lalmonirhat	1,256,099	360,653	9,153	345,492	335,038
Nilphamari	1,907,497	523,324	12,715	483,390	501,158
Panchagarh	987,644	291,636	6,242	256,529	272,177
Rangpur	2,996,336	846,342	19,772	796,171	787,518
Thakurgaon	1,390,042	400,904	7,949	371,786	387,924
Rangpur division	15,787,758	4,565,046	99,693	4,366,832	4,250,488

(vi)Housing Conditions

299. According to the population and housing census (2011), predominant structure of project areas is Kutcha (77.30%) followed by Semi-Pucca (15.95%), Pucca (3.58%) and Jhupri (3.17%). In the project areas, about 24.92% households use no water sealed sanitary latrine including 36.25% non-sanitary and 17.49% water sealed sanitary latrine. On the contrary, 21.34% households have no access to latrine facility and defecate in open places.

(vii) Disability

300. Rates of disability provide an indication of social condition and wellbeing. Table IV-21 shows that the overall disability rate in the project area is 1.7%. Six categories are defined in the Census i.e., disability in speech, vision, hearing, physical, mental and autism. Among these categories physical disability has the highest level with 99463 persons, which is 0.63% of the total population.

Table IV-40: Distribution of Population by Type of Disability

District	Total Population	Type of Disability (%)						
		Total	Speech	Vision	Hearing	Physical	Mental	Autism
	2990128	1.51	0.21	0.29	0.15	0.59	0.2	0.07

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District	Total Population	Type of Disability (%)						
		Total	Speech	Vision	Hearing	Physical	Mental	Autism
Dinajpur		45151	6279	8671	4485	17642	5980	2093
Gaibandha	2,430,627	2.43	0.2	0.46	0.21	0.72	0.72	0.12
		59064	4861	11181	5104	17501	17501	2917
Kurigram	2,069,273	1.55	0.21	0.29	0.18	0.61	0.2	0.06
		32074	4345	6001	3725	12623	4139	1242
Lalmonirhat	1,256,099	1.7	0.22	0.36	0.22	0.61	0.21	0.08
		21354	2763	4522	2763	7662	2638	1005
Nilphamari	1,907,497	1.44	0.22	0.2	0.16	0.61	0.16	0.09
		27468	4196	3815	3052	11636	3052	1717
Panchagarh	987,644	1.57	0.2	0.26	0.2	0.67	0.14	0.1
		15506	1975	2568	1975	6617	1383	988
Rangpur	2,996,336	1.62	0.21	0.31	0.18	0.63	0.2	0.09
		48541	6292	9289	5393	18877	5993	2697
Thakurgaon	1,390,042	1.6	0.2	0.3	0.2	0.6	0.2	0.1
		22241	2780	4170	2780	8340	2780	1390
Rangpur division	15,787,758	1.7	0.21	0.31	0.19	0.63	0.25	0.09
		268392	33154	48942	29997	99463	39469	14209

(viii) Transport & Communication

301. The proposed subprojects are located near national highways, upazila roads or near village roads. The common types of transports are bus, truck, microbus, car, CNG, motorcycle, van and rickshaw. Mobile and wire telephone services are available in most of the areas. During the field survey, it is found that there are several kinds of vehicles are running on the adjacent roads to the subprojects

(ix) Water

302. Within the project areas, the major source of drinking water is tube-well where about 96.13% of populations use tube-well water. On the other hand, only 1.11% of people have access to tap water. Other 2.76% of people have access to neither tube-well nor tap water and consequently have to rely on nearest surface water sources i.e., river, pond, or canal.

Table IV-41: Water Access within the Project Areas

District	No. of HH	Source of Drinking Water (%)		
		Tap	Tube-well	Other
DINAJPUR	716,800	1.43	96.46	2.11
GAIBANDHA	608,700	1.03	94.87	4.10
KURIGRAM	507,300	0.64	96.79	2.57
LALMONIRHAT	290,800	0.63	96.75	2.62
NILPHAMARI	421,100	0.70	96.31	2.99
PANCHAGARH	228,100	1.24	94.53	4.23
RANGPUR	721,600	1.88	95.90	2.22
THAKURGAON	320,900	0.41	97.60	1.99
RANGPUR DIVISION	3,815,500	1.11	96.13	2.76

(x) Fuel Sources

303. In Rangpur division there is no natural gas connection at households' level. They depend on fuel wood, but fuel wood is costly. Field survey work indicated that households use leaves, cow dung, wood/straw for cooking purposes. In some households within urban areas use LPG gas for cooking purposes.

(xi) Electricity

304. Electricity is an important indicator for measuring quality of life. In these project areas, only 32.13% of the households have electricity connections.

Table IV-42: Electricity Access within the Project Areas

District	No. of HH	Electricity Connection (%)
DINAJPUR	716,800	40.7
GAIBANDHA	608,700	35
KURIGRAM	507,300	17.7
LALMONIRHAT	290,800	19.1
NILPHAMARI	421,100	36.4
PANCHAGARH	228,100	28.8
RANGPUR	721,600	42.7
THAKURGAON	320,900	39
RANGPUR DIVISION	3,815,500	32.43

(xii) Poverty level

305. According to the Household Income and Expenditure Survey (HIES) 2016, the poverty rate in Rangpur Division stood at 47.2%. This is significantly higher than the average poverty rate for the entire country, which was 24.3% during the same period. In just six years, the poverty rate in Rangpur Division has halved. In 2016, it was 47.2%, whereas in 2022, it stands at 24.8%1. Rangpur Division had historically faced challenges, but recent efforts have contributed to poverty reduction. Rangpur's poverty rate has decreased in recent years (24.8% in 2022), it's still higher than the national average

306. Limited access to irrigation facilities, proper storage facilities, and market infrastructure can hinder agricultural productivity and income generation in rural areas. Limited access to irrigation facilities, proper storage facilities, and market infrastructure can hinder agricultural productivity and income generation in rural areas. The region's vulnerability to natural disasters, such as floods and droughts, severely affects agricultural productivity, which is the primary livelihood for most residents. The frequent natural calamities damage crops, reduce yields, and lead to loss of income and food insecurity. This environmental volatility is exacerbated by the impacts of climate change, which further destabilize agricultural patterns and productivity. Rangpur suffers from inadequate infrastructure and industrial development, deterring economic growth and investment. Low literacy rates and limited vocational training create a less competitive workforce, hindering job opportunities outside agriculture. A high dependency ratio further strains the working-age population, perpetuating poverty.

307. There is only 1(one) Upazila in Rangpur Division belongs to very low poverty group. Average Poverty rate in Rangpur is 47.23 % accordance with the HIES 2016. A list is given below showing the uper poverty level as per head count ratio method.

Table IV-43: Upper poverty level in Rangpur DIvision

District	HCR (Upper) %
Dinajpur	64.3
Gaibandha	46.7
Kurigram	70.8
Lalmonirhat	42
Nilphamari	32.3
Panchagarh	26.3
Rangpur	43.8
Thakurgaon	23.4
Rangpur division	47.2

(xiii) Gender & Employment

308. The Bangladesh Bureau of Statistics (BBS) Integrated Household Survey and Income and Expenditure Survey (HIES) of 2018 provides valuable insights into the employment landscape across 17 districts of Bangladesh, encompassing both formal and informal sectors. The data illustrates notable variations in both male and female employment rates, shedding light on the economic dynamics at the district level. Traditional gender roles and cultural expectations often confine women to domestic responsibilities, limiting their opportunities for external employment. Societal norms frequently prioritize men's work outside the home while women are expected to manage household duties and child-rearing. Lower levels of education among women in Rangpur significantly contribute to their reduced labor force participation. With fewer educational qualifications, women have limited access to formal employment opportunities, perpetuating a cycle of economic dependency. The region's economic structure, which relies heavily on agriculture, does not provide diverse employment options for women, many of whom lack the necessary skills for other types of work. Concerns about safety and mobility further restrict women's ability to seek and maintain employment. Poor infrastructure and inadequate transportation systems make it challenging for women to travel to workplaces, particularly in rural areas.

309. Gender discrimination in the workplace discourages women from entering the labor force. Women often face unequal pay, limited career advancement opportunities, and workplace harassment, which deter them from seeking or retaining jobs. Additionally, women frequently bear a disproportionate share of family care responsibilities, including childcare and eldercare. This dual burden of unpaid domestic work and potential employment limits the time and energy women can devote to the labor market.

Table IV-44: Employment rate in Rangpur Division

Districts	Male Employment Rate (%)	Female Employment Rate (%)
Dinajpur	54.5	25.5
Gaibandha	52.4	20.6
Joypurhat	60.8	29.2
Kurigram	57.9	30.1
Lalmonirhat	55.7	28.3
Panchagarh	47.4	23.6
Rangpur	59.3	30.7
Thakurgaon	59.3	30.7

Source: HEIS: 2018

(i) Gender & Earning

Table IV-45: Daily average earning rate in Rangpur Division

District	Male	Female
Dinajpur	405	280
Gaibandha	493	325
Kurigram	397	269
Lalmonirhat	440	290
Nilphamari	485	314
Panchagarh	483	397
Rangpur	440	330
Thakurgaon	484	358
Divisional Average of Rangpur	**453**	**320**

310. In Rangpur, male laborers earn 385 with food and 405 without, while female counterparts earn 285 with food and 280 without. Gaibandha, however, lacks data for male wages with food, but those without food receive 493, while females receive 325 regardless of food provision. Kurigram sees males earning 363 with food and 397 without, and females earn 233 with food and 269 without.

311. Nilphamari presents a distinct scenario where male laborers earn 405 with food and 485 without, whereas females earn a mere 258 with food and 314 without. Lalmonirhat showcases a considerable difference between male and female wages, with males earning 400 with food and 440 without, while females earn 251 with food and 290 without.

312. Dinajpur's data reflects also a gender distribution in wages, with males earning 405 without food, and females earning 280 without food. Thakurgaon and Panchagarh also exhibit gender disparities, with male laborers earning 484 and 483 without food, respectively, while female counterparts earn 358 and 397 without food.

313. Persistent gender biases and discriminatory practices in the labor market result in women being paid less than men for the same work, as employers often undervalue women's contributions. Additionally, women in Rangpur typically have lower levels of education compared to men, limiting their access to higher-paying jobs and confining them to low-wage, informal sector positions. The region's predominantly agricultural economy offers better-paying jobs to men, while women are often relegated to lower-paying roles due to societal norms and limited employment opportunities. Traditional gender roles and cultural expectations confine women to domestic responsibilities, restricting their full participation in the labor force and limiting their career advancement opportunities.

(ii) Women's Right

314. In Rangpur Division, civil servants acknowledge women's legal right to information, but practical access remains challenging. Community leaders and experts identify illiteracy, lack

315. In Rangpur Division, while civil servants acknowledge women's legal right to information, practical access remains challenging. Community leaders and experts identify illiteracy, lack of awareness, and family impediments as major obstacles. It is reported that only 52% of employees believe women access information with the same ease as men. Domestic duties and lack of confidence also emerge as significant barriers.

316. Women in Rangpur Division face a range of issues related to their rights and socio-economic participation. Educational disparities are significant, with many girls dropping out of school early due to financial constraints, early marriage, and cultural norms that prioritize boys' education. According to a UNICEF report, only 62% of girls in Rangpur complete secondary education, which severely limits their opportunities for higher education and skilled employment.

317. Healthcare access for women is also limited. Many women in rural areas of Rangpur lack access to essential health services, including maternal and reproductive health care. The World Health Organization (WHO) reports that maternal mortality rates are higher in Rangpur compared to other divisions, partly due to inadequate healthcare infrastructure and cultural barriers that prevent women from seeking medical help.

(iii) Decision Making

318. In Rangpur Division, there are indications of slightly higher female participation in household decision-making, possibly ranging from 35-45% jointly with husbands. The presence of microfinance programs empowering women economically may contribute to their increased voice in decision-making processes, fostering greater autonomy and agency.

319. In Rangpur Division, there are indications of slightly higher female participation in household decision-making, possibly ranging from 35-45% jointly with husbands. This increased involvement is particularly noticeable in decisions related to children's education, healthcare, and daily household expenditures. The presence of microfinance programs empowering women economically may contribute significantly to their increased voice in decision-making processes, fostering greater autonomy and agency. These programs often provide women with access to small loans and savings options, enabling them to start or expand small businesses, thereby enhancing their economic status and bargaining power within households. Moreover, participation in microfinance programs often includes training and support networks, which further empower women by increasing their financial literacy and confidence[10].

320. Empirical studies indicate that when women have control over financial resources, they tend to allocate more towards family welfare, such as nutrition, healthcare, and education, which leads to improved household outcomes. Additionally, community-based organizations and NGOs working in the region actively promote gender equality and support women's rights, contributing to a cultural shift towards recognizing women's roles in both economic and social spheres[11].

c) Community Property Resources

321. Throughout the world, some assets are neither private nor state property, but common property. The term denotes a class of institutions that govern the ownership and rights of access to assets. Common property assets are to be distinguished from "public goods," in that, unlike the latter, used by someone of a unit of a common property asset typically reduces the amount available to others by one unit (in economic terminology, such an asset is rivalrous in use). The institution of the common property creates and harbors reciprocal externalities. As some of the most interesting examples of common property assets are natural resources, this entry is restricted to them. Social Institutions, Khals, Playgrounds can be referred to as common property resources. Hats, bazars and fairs are a social institution or at least the mechanism of not only trade but also social interaction. During survey works no major educational and religious institutions were observed at substations site and distribution line areas. BREB always prioritized those areas where no interventions affect the properties of the local community.

d) Historical, Cultural and Archaeological Sites

322. In Rangpur division there are more than 100 landmarks which are comprised with historical, cultural and archaeological sites. Among them Tajhat Palace, Rangpur, Kantajew Temple, Dinajpur, Town Hall, Rangpur, Nayabad Mosque, Dinajpur, Thakurgaon Sugar Mill, Thakurgaon., Chandamari Masjid, Kurigram, Jamalpur Zamindarbari Jame Mosque, Thakurgaon., Mirzapur Shahi Jame Masjid, Panchagarh are notable.

323. New substation sites are located in semi-urban/rural areas on land owned by the government or private individuals. Most of the substation locations are on cultivated land with standing crops, few trees and vegetation growth of mainly shrubs and grasses. There are no archaeological sites, sensitive cultural or biodiversity receptors of international, national, state, or district importance including protected areas, key biodiversity areas, forest areas, sacred groves, or historical/cultural monuments around the identified substation sites or along the alignments.

[10] https://www.cartercenter.org/resources/pdfs/peace/ati/bangladesh-women-mixed-methods-study-ati.pdf
[11] Hashemi, S. M., Schuler, S. R., & Riley, A. P. (1996). Rural Credit Programs and Women's Empowerment in Bangladesh. *World Development*, 24(4), 635-653.

4. Substation's Site-Specific Baseline (Rangpur Division)

324. When the survey was conducted, all of the substation's locations were not fixed that's why the survey team surveyed the project location on sample basis where most of the land are purchased. Detailed information based on survey outcomes is described in the following table.

Table IV-46: Site-specific information of surveyed substation's location (Rangpur)

Name of PBS	Proposed Substation Location	Baseline condition of the existing substations	Picture
Rangpur PBS	Shahjahanpur	This substation site lying in agricultural land. Total amount of the land is 43 decimals. A local road passing through the substations site. Vegetation Cover is moderate. There is no household and resettlement within 200 meters of the project location.	
Dinajpur PBS	Birol	The proposed location is baren land beside road. There is no houses, pond and any other sensitive receptor within 800 meter.	
Kur-Lalmoni	Polashi	The proposed site is situated beside Lalmonirhat-Burimari highway. The site is mainly agricultural land. No sensitive receptor was identified close to the site & there is no settlement within 400m, and nearest Bazar is 450 m away from the proposed substations site.	

325. According to the land audit a table is given below on land Use of Crop Variety Prior to Purchase.

Table IV-47: Land Use of Crop Variety Prior to Purchase

District	List of SS	Land Size (dec)	Land Use Prior to Purchase	Crop Variety Prior to Purchase
Dinajpur	Bochaganj	45	Crop Cultivation	Paddy
Rangpur	Mithapukur-5	38	Crop Cultivation	Paddy
Nilphamari	Kishoreganj-2	50	Crop Cultivation	Vegetable
Rangpur	Pirgacha-3	54	Crop Cultivation	Paddy

326. Among the audited 30 substations of Rajshahi & Rangpur divisions, 25 SS are surrounded by the villages from all four sides (North, South, East and West) within 1 km radius of the centre of respective substations.

Table IV-48: Distance of Settlement from the Substations Location of Rangpur Division

SS List	North	South	East	West
Bochaganj	820 m	0	0	145 m
Mithapukur-5	258 m	0	176 m	484 m
Dinajpur - 2	280 m	225 m	92 m	75 m
Badarganj -1	773 m	43 m	71 m	67 m
Paglapir	117 m	117 m	78 m	538 m
Kishoreganj-2	384 m	425 m	131 m	464 m
Pirgacha-3	82 m	330 m	137 m	127 m

V. ANALYSIS OF ALTERNATIVE

A. GENERAL

327. Analysis of alternatives means an analytical comparison of the operational effectiveness, cost, and risks of proposed materiel solutions to gaps and shortfalls in operational capability. According to the AIIB ESF-2022, alternatives are examined in a comparative manner: (a) alternatives to the proposed Project that are relevant to the stage of the Project's development; and (b) their potential environmental and social risks and impacts; and document the rationale for selecting the particular alternative proposed. Depending on the type of Project, alternatives examined may include: (a) investment alternatives to address the development objective; and (b) technical alternatives, including Project location, design, technology, and operation. As part of examining alternatives, consider and document the "without Project" alternative. Assess the alternatives' feasibility of mitigating environmental and social risks and impacts, capital and recurrent costs, suitability under local conditions and their institutional training and monitoring requirements. Examine Project alternatives to avoid or minimize Involuntary Resettlement and impacts on Indigenous Peoples. For existing Projects, the scope of alternatives may be limited.

B. NO PROJECT ALTERNATIVES

328. The no-project alternative was considered in the alternative analysis. Because no construction work would be undertaken, the no-project alternative would have no immediate negative environmental consequences. However, significant AT&C losses from the distribution network, as well as aging distribution assets and subsidized tariffs for low and rural users, would further deteriorate BREB's financial situation. Due to a lack of electricity to fulfill the population's power demands, this might indirectly boost demand for wood and other non-renewable fuels. In the Rajshahi-Rangpur Region of West-Northern Bangladesh, the project will enhance the country's rural distribution network, minimize AT&C losses, increase power quality, and reduce outages. As a result, the 'with' project option was chosen above the 'no project' option.

C. LOCATION ALTERNATIVES

329. BREB investigated alternate locations as part of its selection process for the new substations. An existing distribution service is linked to individual residential and commercial customers in a project. As a result, throughout the planning and preliminary design stages, a variety of different paths were examined to maximize the number of customer connections. Long distribution lines were avoided by specifying only short expansions of around 100 meters or less in order to reduce costs. A sufficient right of way and access to the facility through overhead distribution lines were preferred over lines traversing open farmland, which would have required crossing open farmland. PBS and subcontractors preferred locations with short distances to all-weather highways and easy access for PBS and subcontractor equipment. In addition, sites distant from flood plains and other environmentally sensitive areas were preferred. For the protection of public safety, public utilities such as schools, hospitals, and houses of worship were avoided wherever possible when installing distribution lines. The principle that has (and will be) adopted for the selection and design of new equipment is to comply with national requirements as well as considering international good practice per the IFC EHS Guidelines particularly with respect to avoiding the use of PCB oils in the purchase of transformers and the use of all asbestos containing materials in new construction.

D. BEST OPTION FOR THE PROJECT

330. For the existing and proposed Substation within the geographical area of every PBS, the 33 kV source line is proposed, and it will be approved by SE&D. For selection of optimum route of distribution lines some points are taken into consideration: as well as river crossing towers, the following points are taken into consideration: (i) The route of the proposed DL does not involve any human rehabilitation. (ii) Any monument of cultural or historical importance is

not affected by the route (ii)The proposed route of DL does not affect any public utility services like playgrounds, schools, other establishments etc. (v)The line route does not pass through any sanctuaries, National Park etc. (vi) The line route does not infringe with the area of natural resources. In addition, care is also taken to avoid Ecologically Critical Areas (ECA), critical areas, forest areas, homesteads, cultural sites etc. Keeping above in mind the routes of proposed lines under the project have been so aligned that it takes care of the above factors. However, during the design phase, different route alignment will be studied for the selection or finalization of DL route. Detail impact assessment of different line routes will be assessed then.

E. ASSOCIATED FACILITIES

331. According to the AIIB ESS1, associated facilities (Associated Facilities) are activities that are not included in the description of the project set out in the agreement governing the Project, but which, following consultation with the Client, the Bank determines are: (a) directly and materially related to the Project; (b) carried out, or planned to be carried out, contemporaneously with the Project; and (c) necessary for the Project to be viable and would not be constructed or expanded if the Project did not exist. No adverse impact on the associated facilities is noticed.

332. There are no associated facilities identified for the project as the project will only provide modernization and capacity enhancement of existing BREB network in 21 PBS and strengthening electricity distribution system in Rajshahi-Rangpur division.

VI. EVALUATION OF ENVIRONMENTAL AND SOCIAL RISKS, IMPACTS & MITIGATION MEASURES

A. GENERAL

333. This chapter presents the potential impacts on the environment and social and recommends solutions for environmental & social mitigation to deal with unfavorable effects. The environmental & social impacts are structured into three phases as (i) detailed design and pre-construction phase; (ii) construction phase; and (iii) operational phase of the project. It is based on an assessment of the locations earmarked for the 84 new substation sites and provisional routing alignments for sample 33/11 kV distribution lines connecting the new substations with existing substations. For new distribution lines, alignments will be determined following detailed route surveys. Therefore, following the finalization of the locations of the remaining substations and distribution line route alignments, further assessment will need to be undertaken in accordance with the ESMP to confirm the impacts and risks in the ESIA report.

334. In view of the project activities' nature and footprint, the area of effect and the influence area of the project is regarded 1 km of radius around substations and 500 m of alignments along the distributive line. The distribution lines' right of way is regarded as the area of direct effect along the line. However, in terms of indirect effects on ecologically sensitive regions such as national protected areas networks, the potential impact zone is evaluated up to a radius of 5 km of substations and distribution line alignments. Based on these considerations and the available design data, the possible consequences and risks of the project were assessed. Major permanent physical impacts of the project will take place by the construction of proposed new substations and installation of 33 kV and 11 kV new distribution lines.

B. ANTICIPATED POTENTIAL IMPACTS

1. Pre-construction Stage

335. The following is a brief description of impacts envisaged during the pre-construction Phase:

a) Land Resources

336. New substations are situated in semi-urban and rural locations, on land held by the government or private individuals. The majority of the recognized substation locations are on cultivated ground with standing crops, a few trees, and mostly shrubs and grass as vegetation. 33 kV feeder lines from existing 33/11 kV substations require the building of new poles and conductors primarily along existing road corridors within the available right of way or perhaps crossing agricultural or plantation property for new substations.

337. The proposed sites for substations are vacant at present and require development for power, water, access roads and drainage. The project site has to be raised to the level of 2 ft. (above highest flood level) as preventing flood-related damage to substations also reduces the environmental impact associated with disposing of damaged equipment and the release of hazardous substances into floodwaters. Elevating substations is part of building a more resilient electrical grid. Resilience ensures that the grid can withstand and recover from disruptions, including natural disasters, more effectively. Raising the substation above flood levels is a proactive measure to mitigate the risk associated with extreme weather events, such as hurricanes, heavy rainfall, or storm surges. It reduces the likelihood of damage and minimizes the need for emergency repairs. There will be no major impacts & risks raising the site level on the surroundings areas as the required land for substation is very small and there will be no possibilities of inundation, crop damage and access to common properties. In addition, the substation requires a very small land area, the overall change in drainage

patterns might be minimal. The Rajshahi & Rangpur division area are not at risk of flooding from nearby water bodies, so raising the level wouldn't significantly impact existing drainage. However, it's crucial to address these aspects thoroughly during the planning phase. Design the substation site with proper drainage features essential to prevent flooding and erosion.

338. Around the identified substation sites or along the alignments of the 33 kV distribution lines, there are no sensitive cultural or biodiversity receptors of international, national, state, or district importance, such as protected areas, key biodiversity areas, forest areas, sacred groves, or historical / cultural monuments, that will be impacted by the construction or operation of the substations.

339. Under this project the total length of overhead distribution line to be constructed/ upgradation/ conversion is 19,489 km. those lines will be installed on demand basis during the implementation phase. Since the proposed new distribution lines and their route is not finalized at this stage. So, the survey work couldn't be possible for new distribution lines. However, the consultant has assessed the generic impact of construction of DL as per BREB's earlier experiences and according to BREB's experience most of the DL route passes through the vacant land. Any monument of cultural or historical importance and public utilities are not affected by the route. On the other hand, laying 48 km of 33 kV underground cables and 60 km of 11 kV underground cables requires sufficient space alongside the route to substations. This might be a challenge in densely populated areas.

340. The identified new substations are located in rural areas mostly on the open land available on the outskirts of villages. During site visits, no threatened species were found in the project area, and community consultations revealed no evidence of the presence of any species of concern. During survey work for the distribution lines, any locally important receptors (e.g., trees and physical cultural resources) would be avoided as much as possible.

341. This project prioritizes minimizing its environmental impact by carefully selecting routes. Land acquisition will focus on utilizing government land, leases, or already-developed private land. Stakeholder input will be considered in managing any remaining land needs. PBS will prioritize a "willing buyer willing seller" approach for land purchases, with additional support offered to vulnerable groups. To ensure environmental safety, existing substations will undergo a Phase 1 Environmental Site Assessment.

b) Hazardous Material, Waste Management & Potential Legacy Contamination

342. Liquid petroleum fuels may be used and stored for vehicles and other equipment. PCBs is dangerous if leaked and are toxic and bio-accumulative. Unless transformers have been certified PCB free, all workers working with existing transformers must avoid all exposure to skin and eyes and avoid any potential for accidental ingestion by wearing suitable chemical and/or oil resistant gloves, goggles, and protective clothing during sampling processes and under normal working conditions.

343. Leakage of transformers release toxic liquid into the environment. Disposal of old transformers will be required to follow the national regulations on hazardous waste management for transport, storage, and disposal of potentially PCB oil containing transformers. BREB always abandoned PCB containing materials in their construction materials.

344. As per the compliance issues, BREB always tests the oil which is used in the transformer to check PCB containing material (Annex- 16) BREB always uses PCB, TPH and VOC free materials and equipment. Transformers are also located on concrete pad platforms with oil liners for any potential leakage.

345. There will be no procurement and use of transformer oil with PCB for this project, and all transformer oil bought will be tested for PCBs as part of BREB's internal procedure.

346. In a typical indoor substation of BREB, A very well-designed drainage system is used through which storm/rainwater is normally left to the adjacent area in a natural way. At the same time, since there is no scope of water to get contaminated with any chemical properties, that's why no separate wastewater management is maintained/needed in our substation. It should be noted that the drainage system is designed based on the situation/land location by the consultant during the implementation stage.

347. BREB does not have any provision to store any transformer oil for maintenance purposes within the substation boundary. BREB operates regularly scheduled maintenance activities for substations. When transformer oil needs to be refilled then the BREB collects new oil from the supplier and dispatch the old transformer oil to the centrifuging agency.

348. Generally, transformer oil does not spill from the power transformer. In a typical case, if any leakage occurs, it can be notified at once since there always remains an attendant in every substation and the oil is collected then and then. After proper maintenance, the collected oil is reused following the proper procedure. So generally, no soil contamination can occur.

349. Moreover, in the recent design of BREB, a reservoir is kept in the design around the transformer pad which has a capacity of 110% of the total capacity of transformer oil and thus remains no scope to contaminate the soil.

350. A proper stormwater management plan is essential. This could involve installing drainage channels, detention ponds, or using permeable materials to allow water infiltration. If the substation generates any domestic wastewater (e.g., from toilets or sinks), a septic system or connection to a municipal sewer system might be needed, depending on local regulations. A plan for handling any potential leaks of transformer oil or other contaminants should be in place. This might involve spill containment measures and proper disposal procedures.

Table VI-1: Signboard on PCB free transformers of exiting substations

c) Interference with other Utilities and Traffic

351. Before beginning construction, BREB will seek approval from agencies such as the Forest department, the Department of Railways, the Department of Roads, the Department of Telecommunications, and, if necessary, the Department of Aviation. Because all new

substations will be built on purchased land by each respective PBS, no interference with other utilities or traffic is expected, but necessary clearances for distribution lines will be obtained. No reserve forest land will be traversed based on current routing practices, so forest clearance may not be required. In the event the alignment of the distribution lines passes through reserve forest land, forest clearance would need to be obtained before the commencement of the work in forest areas.

352. A contractor's traffic management plan will be developed under the project ESMP and approved by BREB before work begins to minimize risks from interference with existing roads at construction sites and used for haulage. Before any work begins, the contractor will prepare a traffic management plan in consultation with the appropriate local authorities for approval. Additionally, the project will obtain necessary clearances from relevant Bangladeshi government utilities potentially impacted by the construction (electricity, water, telecommunications, etc.). In addition, the TMP will cover the river traffic as six river crossing tower will be installed though there will be no impact on river traffic and navigation.

353. There's a risk of accidentally damaging existing underground utilities like water pipes or gas lines during excavation for laying the underground cabling. If underground cables are damaged, repairs can be more complex and time-consuming compared to overhead lines.

d) Construction of Access Roads

354. In terms of traffic, existing access roads to substations will be utilized to the greatest degree feasible. The majority of new substation locations are accessible from existing village roads or state highway paved highways at distances ranging from 50 to 100 meters. Some of the existing village roads are in disrepair, and unpaved access roads utilized for construction traffic and operational access will be (re) surfaced with concrete or asphalt to connect the substations to existing paved roads. As BREB's regular practice is to construct substations close to adjacent road. In previous experience of BREB, there isn't needed to construct separate road for accessing into substation. However, there is a provision for access roads which will be implemented within the project budget.

355. There will be no need for new access roads for distribution lines because all lines will be linked to existing roadways within 50-100m access lengths.

e) Proximity of Sensitive Receptors/ Indigenous Community

356. Within 100m of some of the substation locations, there are residential houses, schools and mosque. When internationally recognized design and environmental health and safety standards are applied, as they will be in this project, such close proximity to nearby residences of less than 50m is acceptable.

357. For residential areas, the maximum allowable Community Noise, World Health Organization (WHO), 1999 guidelines (1-hour LAeq) noise levels are 55dBA during the day (0700–2200hrs) and 45dBA at night (2200 - 0700hrs).IFC EHS Guidelines (2007) for noise indicated that the noise levels should not exceed these values OR result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site.

358. Since most of the equipment installed at substations is static, transformers should be placed at least 10m from the site boundary in order to reduce noise levels. Once substations are operational, transformers will also need to be well-maintained. To achieve 45-55 dBA at 1m, transformers with power levels of 2.5 MVA and 10 MVA will be required. Sound pressure levels from transformers will drop by at least 3 dBA for every doubled distance, according to IEEE Standard 1127. In other words, if the noise level of the transformer is measured at a distance of 10 m from the source, this gives attenuation in the noise level by at least 20 dBA.

359. Trans-formators will be replaced with modern, low-noise equipment at 35 of the existing 33/11 kV substations to be augmented, which will reduce noise levels. Furthermore, the substation sites to be augmented are mostly located at distances well away from residential areas and other noise-sensitive receivers such that noise impacts will be negligible.

360. In the case of the 33/11 kV feeder lines, the statutory horizontal clearance distances from buildings will be maintained. As a result of the greater vulnerability of children, new distribution lines will be routed away from schools and playgrounds during survey work.

361. After screening the proposed and existing substations locations as well as river crossing tower, it has been identified that in our project area most of the sensitive receptors are far from the project boundaries. In Dinajpur PBSs area, a school is identified as sensitive receptor in proposed Kakra river crossing tower. This school is 200 m away from anchor tower 1. There will be no impact during the construction phase as proper fencing will be there to avoid the risks. In addition, in Gaibandha PBS there are two Schools and one Madrasa which are also more than 100 m away from the anchor tower locations.

362. Among the 30 surveyed substations including newly proposed substations and old substations, indigenous communities (Santal and Orao) are resided in 5 substations within the range of 1km radius from the center of the substation. Among these 5 substations, 3 are old and 2 are newly proposed. The santal are resided near 4 substations and orao are resided near 2 substations. It is noted that in Godagari -1 old substation, both santal and orao are resided within 1km radius of the substation center. Due to this project, IP communities will be more benefited as new or upgraded substations could lead to improved access to electricity for nearby indigenous communities. This can improve living standards, power homes and appliances, and potentially open up new economic opportunities.

363. On the other hand, substation construction and operation can disrupt traditional cultural practices and sacred sites if not carefully planned. Land acquisition led to loss of traditional hunting grounds, agricultural land, or access to natural resources for the indigenous communities. However, BREB and PBS have not purchased or acquired any land for the IP communities. In future BREB will always try to avoid the purchase of land inherent by IP community. An influx of workers might also lead to social friction if not properly managed.

364. To minimizing the impact BREB will prepare Indigenous People Plan (IPP) and Indigenous People Plan Framework (IPPF) that covers the various factors like project design, community engagement, and mitigation measures implemented. Some measures are as follows:

- Free, Prior, and Informed Consent (FPIC): Obtain FPIC from the affected indigenous communities before proceeding with any construction activities. This involves transparent communication, ensuring communities understand the project's potential impacts and have a say in the decision-making process.
- Provide employment opportunities for members of the indigenous communities during construction, promoting local economic development.
- Explore alternatives to minimize land acquisition from indigenous communities.
- Appoint a community liaison officer to act as a bridge between the project team and the indigenous communities, addressing concerns and ensuring effective communication.
- Respect the cultural practices and traditions of the indigenous communities and avoid activities that might disrupt them.

f) Disaster Risk

365. Both Rajshahi and Rangpur are flood-prone regions due to their location in the Ganges-Brahmaputra-Meghna (GBM) delta. They experience flooding almost every year, with

varying degrees of severity. In 1987 this devastating flood submerged large parts of Bangladesh, including Rajshahi and Rangpur. It caused widespread damage and loss of life. In 1998 Flood, another major flood that caused significant damage to infrastructure and agriculture in these divisions. As well as the flood in 2007 also affected Rajshahi & Rangpur divisions.

366. At present the location of 314 km line is not finalized. As this only distribution line, it will be finalized during construction stage on demand basis. These flooded areas identified are just a subset of many that need rehabilitation based on BREB's record of historical and future flooding scenarios. This project component activity will involve replacing existing poles with higher ones and, if necessary, rerouting the lines to avoid flood zones However, the secondary data showed that the historical prone flood affected area in Rajshahi division are; Bagha Upazila, Godagari Upazila, Tanore Upazila, Paba Upazila, Charghat Upazila. In additions, the historical prone flood affected area in Rangpur division are; Kurigram Sadar, Kaunia Upazila, Gangachhara Upazila, Ulipur Upazila, Sundarganj Upazila

367. Due to some substations and distribution lines being located in floodplain areas, like Bogra, Chapainawbganj, Kurigram, the detailed design will include measures to reduce disaster risk. Details of climate change adaptation measures will be considered in detailed design. These include raising the transformer platforms in substations up to 2 ft above the highest flood level, among other things. Raising the site level for a substation in Bangladesh's flood-prone areas can offer protection from flooding for the substation itself. Raising the site creates a barrier, potentially forcing floodwaters to divert to lower-lying areas downstream. The raised site can disrupt natural drainage patterns, leading to waterlogging in nearby fields. Raised sites may encroach on common grazing land for livestock, impacting the livelihoods of farmers who depend on it. Raising the site level could damage or disrupt existing underground utilities like cables or pipelines. These impacts are not significant as BREB's early experience.

368. By carefully considering these risks and implementing mitigation measures, the few negative impacts on surrounding areas from raising a substation site level can be minimized

369. To mitigate the arisen impact BREB will keep the provision to design a drainage system for the raised substation site to manage stormwater runoff effectively and prevent ponding. Integrate this system with the existing drainage network to minimize disruption. By prioritizing responsible construction practices, effective drainage design, and environmental restoration efforts, the project can achieve its desired outcome while minimizing the risks and negative consequences on the surrounding area.

g) Ecosystem

370. On a local level, tree felling has a direct impact on the production of wood and biomass. As per the directives of the Social Forestry Act, ecological impacts can be reversed by planting site specific tree species (2004). If trees are cut down, they will have an impact on other flora, as well as on wildlife. Any loss of trees will impact other flora and may affect wildlife, particularly birds and mammals that rely on trees as their food source. Besides, the loss of trees may increase soil erosion from rain cuts. Apart from trees and undergrowth other vegetation affected will be crops, bamboo bush, and other native vegetation. No major changes in the hydrological regime will occur in the proposed project area due to the absence of devastating floods, cyclones and severe storms. One of the regular programs to maintain the integrity of the distribution lines is the trimming of tall trees and vegetation along the ROW. Loss of standing crops (if any), grass and bushes of substation sites and construction camp sites.

371. In prior to construction, Biodiversity Screening Framework and detail biodiversity screening assessment should be carried out after finalization of all DL route and detail design to identify potential impacts on biodiversity early in the planning stage. The screening process helps identify the presence of protected or endangered flora and fauna. This allows for specific

measures to be taken to avoid disturbing or harming these species, ensuring compliance with environmental regulations.

372. The project prioritizes minimizing tree disturbance by strategically choosing routes that avoid areas with dense vegetation. Tree cutting or trimming will only occur when absolutely necessary to ensure safety clearances. If fruit-bearing trees of economic value are impacted, compensation will be provided according to the project's Resettlement Plan. Additionally, tree cutting activities will be scheduled outside bird breeding seasons to minimize ecological disruption. Replanting efforts will focus on native species to restore the habitat for both flora and fauna, and landowners will be adequately compensated for any necessary vegetation clearing before work begins.

h) Occupational Health and Safety

373. The construction of substations and 33 and 11 kV distribution lines pose some risk to the health and safety of workers. There will be workers' campsites at the new and existing substations and therefore the detailed design must ensure adequate sanitation and welfare facilities are incorporated into the labor camps. According to the guidance notes by IFC and the EBRD (2009), the following standards need to take attention for housing of workers:

- Minimum space allocated per person or per family (floor area; cubic volume; or size and number of rooms)
- Supply of safe water in the workers' dwelling in such quantities as to provide for all personal and household uses
- Adequate sewage and garbage disposal systems
- Appropriate protection against heat, cold, damp, noise, fire, and disease-carrying animals, and, in particular, insects
- Adequate sanitary and washing facilities, ventilation, cooking and storage facilities and natural and artificial lighting
- A minimum degree of privacy both between individual persons within the household and for the members of the household against undue disturbance by external factors
- Suitable separation of rooms devoted to living purposes from quarters for animals.

374. There are some additional requirements and standards which need to take consider for workers which are given below:

- Garbage containers will be provided for the disposal of garbage created by workers, as rubbish burning will be forbidden.
- Indoor food preparation and a clean eating space, a sufficient supply of non-wood fuel for cooking.
- For any BREB stationed at the substation (typically little more than 2 or 3 people), a drinking water supply that satisfies drinking water requirements must be supplied.
- Toilets with hand washing facilities and a private bathing area linked to a sewage system or septic tank.

375. To mitigate this risk, the installation contractor will be required to prepare and implement an occupational health and safety risk assessment and plan for approval before construction works. The risk assessment should be undertaken through a facilitated risk assessment workshop involving the contractor, BREB, and project implementation agency. The occupational health and safety plan should follow the health and safety hierarchy including measures set out in the IFC EHS General Guidelines, Section 2 on Occupational Health and Safety, and those on Electric Power Transmission and Distribution.

i) Community Health and Safety

376. The substation itself carries risks as it controls power. There is always a risk of accident and shock. Although people do not know about risks in new substation locations, they imagine

that power can cause accidents if there is no proper management. Furthermore, according to them, the substation may bring risks of explosion if they are not managed during the environmental disasters. In old substations, most of the people reported no accident or harm driven by the substations. In only one old substation, an accidental case was identified, where people constructed their house close to the overhead cable. In principle, this cable is not covered. A member of that household came to the contact of the cable while walking and talking over phone on the rooftop. This was not fatal rather just experienced sudden shock. According to the household members, they perceived accidental risk from uncovered cable and insulator burst.

377. To mitigate potential impacts to the health and safety of villagers, the contractor will be required to develop a community health and safety risk assessment and plan (specific attention will be given to Covid-19 and other infectious diseases risks and mitigations) for approval before construction works that incorporate good international practices and recognized standards such as emergency response and preparedness procedures, communication systems and protocols to report any emergency, including interaction with the commune and provincial emergency and health authorities. IFC EHS General Guidelines, Section 3 on Community Health and Safety, and those on Electric Power Transmission and Distribution will be followed in developing the community health and safety plan by the contractor. The risk assessment should be undertaken through a facilitated risk assessment workshop involving the contractors, BREB, and PIU. Community health and safety measures e.g., fencing and signage will be incorporated into detailed design. Construction sites typically lack proper fencing and security, allowing unauthorized access. Children, curious individuals, or those under the influence might enter the site, risking electrical shock, falls, or injuries from equipment though during construction stage, every PBS will ensure the security of community.

2. Construction Stage

378. Following is a brief description of impacts envisaged during the construction Phase:

a) Water Resources

379. During construction, greywater generates from the base camp location and may contaminate local water body and soil if mixed into irrigation canal and local waterbodies. Spillage of any kind of oil or lubricant during construction activity may hamper soil and ground water quality.

380. In the case of construction of ground water abstraction units (tube wells) at Project site, then licenses will need to be obtained prior to installation of any tubewell.

381. For the river crossing tower as the tower is far from the riverbank and not within the navigation channel, there should be no impact on river traffic. As well as there will be no pile driving activities occurring in the river. Each RCT is consists of two anchor towers and two suspension towers. The construction of these towers will avoid the water channel. So, there will be no impact to the aquatic resources and to avoid any impacts on river-based activities such as navigation activities like passenger and cargo transport, boats, ferries, fishing etc. the clearance for the tower line will be fixed upon considering navigation clearance. The clearance will be given by BIWTA (Bangladesh Inland Water Transport Authority). The BIWTA has the classification, and the 4 rivers are classified as Class 3 where vertical clearance is 12.19 meters and horizontal clearance is 30.48 meters. So, there will be no impact on navigation due to the stringing activities. It has been mentioned in the report for reference as well as a sample navigation clearance certificate obtained by BREB which has been given in the Annex. A minor impact will occur during stringing operation of power line. These may disturb birds and other wildlife, particularly during breeding seasons. So, to mitigate the adverse impact avoiding construction during breeding seasons or establishing buffer zones around critical habitat areas.

382. The project prioritizes responsible waste management and pollution control. Adequate sanitation facilities, like septic tanks or portable toilets, will prevent untreated sewage from contaminating nearby water sources. A designated construction waste collection and disposal system will ensure proper handling of waste materials. To minimize the risk of water pollution, equipment servicing, refueling, and washing will occur at least 50 meters from water sources, with oil and grease traps filtering runoff before discharge into a settling pond for final treatment. Regular maintenance of construction equipment will further reduce the risk of leaks or spills. These measures combined demonstrate the project's commitment to minimizing its environmental footprint. A waste management plan has been developed to guide contractors regarding the management of solid and hazardous waste & the final versions of all plans to be prepared by contractor and will check by PBS and BREB as requirement prior to mobilization on the site.

b) Biodiversity

383. The main impact of distribution lines on biodiversity is the electrocution of animals, especially monkeys and birds but the cases are very rare. Birds have special ability which prevent them from getting electric shock, however during rainy period by touching positive and negative wire together they may get shocked and be killed. The typical electrocution rate for birds can be reduced by 85 percent by preventing them from perching on the pole and by establishing a barrier to prevent them from touching the live cables. It is relatively affordable to implement and requires no additional maintenance.

384. To safeguard wildlife during construction, this project will clearly mark work areas and establish buffer zones around sensitive habitats to minimize vegetation clearing. Additionally, security measures like fencing, patrols, and controlled access will deter unauthorized entry and poaching activities. The project will also engage local communities to raise awareness about biodiversity conservation and encourage their involvement in protecting wildlife.

385. In additions some additional mitigative measures like avoiding mass clearing, avoiding clearing along creeks and drainage lines, retaining vegetation along gullies and steep slopes, implementing pest management plans, implementing a vegetation program, tagging hollow-bearing trees, deploying personnel during construction, and maintaining microhabitats to minimize impacts on species and habitats. If workers encounter wildlife, especially protected species, stop work immediately. Depending on the species and situation, contact the relevant wildlife agency (e.g., forestry department) for guidance or assistance. Do not allow workers to handle wildlife themselves and finally for some species, relocation by trained personnel might be necessary.

c) Land Resources

386. The topography of the project area may slightly be changed as a result of project activity. For substation building, a few pond/ditch excavations for filling materials may have an impact on surrounding agricultural land though most of the purchased lands are located at vacant land. Trimming plants from the ROW will alter the landscape's look temporarily. However, these effects are only brief and have a small negative influence.

387. The construction and maintenance of distribution line rights-of way, especially those aligned through forested areas, may result in alteration and disruption to terrestrial habitat, including impacts to avian species and an increased risk of forest fires.

388. According to the site visit at the proposed river crossing tower’s location it has been anticipated that the riverbank is far away from the proposed project. Construction activities could cause minimal vegetation removal or disruption of wildlife movement patterns. Given the distance from the river, this impact is likely very small.

389. While converting LT lines to HT lines offers economic and technical advantages, the environmental and social benefits are less direct. In some cases, converting existing LT lines to HT lines might require less additional right-of-way compared to building entirely new power lines. This could minimize the need for land acquisition and potential habitat disruption.

390. To minimize the impact on land resources, follow design drawings and implement careful construction practices to avoid damage to existing structures (e.g., buildings) and roads, crops, bunds, canals and drains and defining the work zone and preventing incursions outside the agreed-upon impact corridor.

d) Agricultural Resources

391. Construction activity may have an impact on agricultural land and crop production, though most of it will be for temporary periods only. In case of road unavailability in the proposed substation, some agricultural land may be affected for a limited time period. Project vehicle movements in dusty areas may infect tree leaves by depositing dust and smoke and affect the photosynthesis rate until sprayed with water properly.

392. According to the interim land audit report, land of the newly purchased substations was used for a variety of crop production. Only a single substation area is used for banana gardening. Land of 18 new substations were used for double cropping farming and in remaining 4 substations, owners/tenants sometimes practice triple cropping but due to unavailability of labors at dull period they sometimes drop the cultivation in that specific season.

393. In terms of variety of crop production, it is noted that 7 of the purchased substation land produced variety of crops i.e. Paddy, Pulse, Maize, Vegetable & Cash Crops while remaining are used for paddy cultivation only. In Kahaloo, land of Kahaloo-2 SS is used for single cropping and in remaining time it is inundated by monsoon water, but development of this land could not disrupt the connectivity with surrounding wetland.

394. Reducing the project's impact on agriculture is its top priority. Construction will prioritize non-agricultural areas over rich farmland whenever feasible. In order to maintain its potential for agriculture, topsoil will be piled up. In order to manage water resources and guarantee agricultural viability, appropriate drainage systems will be implemented both during construction and in the long run. To increase crop productivity all year round, irrigation can be accomplished with both deep and shallow tube wells. In order to secure the continuous flow of animals and agricultural equipment, the project will investigate including cow passages and endeavor to uphold clean construction methods.

e) Fisheries

395. There are some impacts on fisheries. These are given below:

- Loss of floodplain areas and burrow pits/ponds with consequent loss of aquatic fauna and flora
- Earth/sand filling activities may produce fine dust particles which affect the physiological functioning of plants and animals, in addition to respiratory disturbances to humans.

396. This project emphasizes protecting water quality and aquatic life. Construction crews are strictly prohibited from discarding any garbage, toxic or otherwise, into nearby water bodies. If a section of a river or stream containing fish is temporarily blocked for construction, a thorough inspection will be conducted to ensure all fish are safely relocated to nearby healthy habitats. These measures demonstrate the project's commitment to minimizing its impact on aquatic ecosystems.

f) Burrow Pit

397. Earth and gravel are fundamental materials in construction for several reasons and BREB mainly sourced this earth, gravel etc from locally. Burrow pit is essentially a hole or excavation dug to remove specific materials like gravel, sand, or soil. These materials are then used as fill at another construction location. Since the borrow pit locations are not finalized, it's crucial to consider the potential risks and impacts before selecting sites.

- Borrowing pits can disrupt natural habitats and displace wildlife, especially if located in ecologically sensitive areas.
- Improper excavation and management of borrow pits can lead to soil erosion, sedimentation of waterways, and loss of fertile topsoil.
- Borrow pit activities can pollute nearby water sources through dust, runoff containing pollutants, or accidental spills.

398. The material removed from the borrow pit is often used to create embankments, build roads, or fill in other areas where additional material is needed. As this project scope is limited to construction new indoor substations where substation building areas will not be large in infrastructure. So, a significant level of borrowing pit will not be required for this project. If any borrow pit is required then PBSs will find suitable locations avoiding any disruption. For Identification and selection of sites for disposal and borrow pit some criteria and mitigative measures should be considered as follows:

- Locations will not in ecological sensitive area (e.g. Protected Area or Key Biodiversity Area)
- Locations will not in wetlands or riparian zones, i.e. at least 500 meters from river, lake etc.
- Above the 0.05 (5%) Annual Exceedance Probability flood line.
- Not on slope-land of more than 10%, to avoid erosion or landslid.
- Not in land with agricultural, spiritual, cultural, historical value, etc.
- Not where groundwater emerges, or a thick organic layer is present. Where possible existing borrow pits or spoil disposal sites shall be used. If new sites are needed, the contractor shall obtain approval from the relevant authorities and from PMU/PMC to ensure that sensitive habitats are avoided, and that appropriate mitigation and rehabilitation measures will be implemented.
- Obtain and document agreement with the landowner.
- Ensure minimization of vegetation and habitat loss and limit land clearance to only the land required for the borrow pit / spoil disposal.

g) Ecosystem

399. The project implementation activities, at different locations, will invariably involve trees and vegetation to be removed for the upgrade, widening, and geometric improvement of the project corridor.

400. All of the trees on both sides of the proposed project alignment that are affected by the proposed project's alignment are of equal economic, ecological and aesthetic importance. In addition, the removal of any trees will have a negative impact on the surrounding environment as well as birds, animals and other fauna. Particularly, the wildlife that lives near the damaged trees will lose the ecological benefits provided by those trees for the rest of its existence. Destruction of mature trees will cause ecological loss to the environment.

401. The project alignment of the 33/11 kV distribution lines may go over some trees and vegetation which may also be affected and would need to be cut or trimmed in order to achieve

the standard safety clearances for distribution power lines. As part of the comprehensive route alignment surveys, the number of trees to be chopped or trimmed will be determined. The position of the concrete poles within the road reserve can be easily modified during the finalization of the line route's position to minimize tree damages.

402. The combination of the height of river crossing towers and distribution poles and the electricity carried by distribution lines can pose potentially fatal risk to birds and bats through collisions and electrocutions. Avian collisions with power lines can occur in large numbers if located within daily flyways or migration corridors, or if groups are traveling at night or during low light conditions (e. G. Dense fog). In addition, bird and bat collisions with power lines may result in power outages and fires.

403. This project prioritizes protecting ecologically sensitive areas and minimizing tree loss. Construction will avoid protected areas, reserved forests, and sacred groves. Mature trees will be identified and spared whenever possible. Work zones will be clearly demarcated to prevent encroachment. Tree cutting or trimming will only occur when absolutely necessary to meet safety clearances, as outlined in design plans. Unavoidable loss of fruit trees with economic value will be compensated according to the project's Resettlement Plan. Public trees (being removed due to the construction activity) will be replaced with native species chosen in consultation with the forest department. To protect wildlife, tree cutting will be scheduled outside bird nesting and breeding seasons, and ecological surveys will be conducted for critically endangered species before construction begins in their habitat. Finally, all tree removal, including public trees, will require prior approval from the forest department, and compensatory afforestation will be implemented to offset any losses. These measures demonstrate the project's commitment to minimizing its environmental impact.

h) Hazardous Material, Waste Management & Potential Legacy Contamination

404. It is possible to use and store liquid petroleum fuels for vehicles and other equipment. The IFC General EHS Guidelines (2007) will be followed for the prevention and control of hazards associated with spill prevention, emergency response, clean-up, and contaminated soil remediation. Specifically, IFC EHS Guidelines for Electricity Transmission and Distribution (2007) will be followed for hazardous material and waste management.

405. In accordance with national regulations and the IFC EHS Guidelines for Electricity Transmission and Distribution (2007), the management of waste will be carried out. Per good practice, prior to final disposal, retired transformers and equipment should be stored on a concrete pad with curbs sufficient to contain the liquid contents of these containers should they be spilled or leaked. The storage area should also have a roof to prevent precipitation from collecting in the storage area. Disposal should involve facilities capable of safely transporting and disposing of hazardous waste. After reaching the BREB stores, scrap metal and equipment can be recycled. Existing transformers are stored on open ground. Old conductors will be stored in regional stores and sold to third-party vendors for further recycling, according to BREB policies. On-site storage of solid and hazardous waste generated during construction will be limited. A licensed waste management operator will recycle or dispose of it in a specially designed and licensed waste management facility, as directed by the contractor. The contractor will keep records of materials used, generated waste, and third-party waste transfers.

406. As a result of the lack of test data, the contractor must assume that all transformers at existing substations or those that will be disturbed by the distribution work contain some hazardous substances. Unified Nations Environment Protection Agency (UNEP) Guidelines for the identification of PCBs and materials containing PCBs, and a health and safety risk

assessment and plan to refer to UNEP (2002) PCB transformers and capacitors: From management to reclassification, are the only ways to determine this. If PCB comes into contact with the skin, immediately rinse the affected area with large amounts of running water. Since the practice of using PCB in transformers are already avoided in BREB.

407. If asbestos is discovered at any of the existing facilities and is in danger of being disturbed by construction work, exposing workers to asbestos dust, it must be removed safely and treated as hazardous waste. Details Asbestos-Containing Material Management Plan (ACMMP) are given in Appendix 11.

408. In BREB service, there is no provision for recycle of wooden pole according to PBS instruction 300-52[12] as well as Treated wood products shall never be burned according to PBS instruction 100-5. BREB will use chromated copper arsenate (CCA) for preservation of wood, but the quantity is less. Instead of this, BREB will use these wooden poles for different purposes as treated wood. For reuse there is some guideline for reused of wooden poles such as

- Large size wooden poles can be separated from waste parts to make small size poles, logs, and transformer re-winding.
- Before disposal/demolition, the good part of the spoiled and unusable wooden poles can be used as fencing/boundary in different areas of the PBS.
- As well as a letter has been issued from BREB to all PBSs on proper handling, storage and uses of poles which have been given in the Annex.

409. BREB has its own instruction manual (PBS INSTRUCTION: 100-29 & 100-30) for Substation/ Distribution network Operation, Inspection and Maintenance. In additions BREB always follows a training manual/guideline of safety working procedure for distribution network operation. As well as in every tender document BREB is strictly prohibited PCB, SF6 and other hazardous materials.

i) Nuisance to Nearby Properties

410. During construction, the following items may cause annoyance to nearby properties:

- Noise and vibration from construction equipment and heavy vehicles transporting materials to the sites.
- As a result of the excavation and transportation of materials, dust is created.
- Exhaust gases are responsible for air pollution.
- Welding creates gaseous emissions.

411. Over a short period of time, mechanical equipment will be used for temporary and intermittent purposes. The majority of the work will be done by hand. The main noise and dust-generating activities will be associated with excavation for construction platform preparation of substations and periodic transportation of materials and equipment to the sites. All of these activities will have only a minor and intermittent impact on nearby communities in terms of noise, dust nuisance and air pollution. Nevertheless, the contract documents shall specify good construction practices to minimize these temporary construction impacts.

412. As per Community Noise, World Health Organization (WHO) guideline, 1999 in residential areas, the maximum allowable noise levels are 55 dB (A) during daytime hours (0700-2200hrs) and 45 dB (A) during nighttime hours (2200-0700hrs), which are equivalent to the WHO noise guidelines of 1-hour LAeq. Because the project will only be completed during the day, the contractor will be required to adhere to a 55 dBA noise limit. Noise impacts should

[12] PBS Instruction 100-53, BREB Instruction 500-22

not exceed the levels stated or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site. In general, the noise level limit is represented by the background or ambient noise levels that would be present in the absence of the facility or noise source(s) under investigation (IFC EHS Guidelines 2007.

413. During the construction of the project, periodic noise monitoring (at least twice during the construction period) will be carried out during noisy construction activities at substations such as excavation for platform preparation and delivery of equipment to sites. When the nearest residence is less than 100 meters from the construction site or access road, monitoring points will be placed on the facade of that residence. If noise levels exceed the allowable standard during noise monitoring, the contractor will be required to take additional noise mitigation measures, such as changing his working methods or erecting temporary noise barriers/fences, to ensure that noise levels do not exceed the allowable standard.

414. Mitigation measures for noise at substations and on distribution lines will be in accordance with national regulations and the IFC EHS General Guidelines and will include:

- All activities will be scheduled only during normal working hours (8 a.m. to 6 p.m.); any work outside of these hours will only be done with the consent of the local community and residents within 100 meters.
- Avoiding noisy works on the weekends, public holidays, religious festivals, and for work in proximity to schools, during exam periods ─ any noisy works within these periods to only be undertaken with the agreement of local community and residents within 100m.
- Use of low noise generating equipment, such as sound pressure levels of less than 55dBA at 1m.
- Construction machinery and vehicles should be maintained to keep noise to a minimum and in accordance with any national noise standards.
- Where sensitive receptors are within 50m of construction works temporary acoustic noise fence to be used.

415. Mitigation measures for dust/air pollution at substations and on distribution lines will be in accordance with national regulations and the IFC EHS General Guidelines and will include:

- Access roads to substations that are in poor condition or are unpaved must be resurfaced before any excavation or other earthworks at the substation can begin.
- Remove existing vegetation and topsoil as little as possible and as soon as possible.
- Any areas where excavation and other earthworks are performed should be replanted with native species or resurfaced.
- Water to be sprayed to suppress dust during works are in the vicinity of communities; water should be sprayed at least twice a day at substations and on unpaved access roads to distribution lines but more often if needed during excavations, earthworks, and windy conditions that enable dust to be easily mobilized.
- Vehicles delivering construction materials shall be covered.
- Vehicles and construction equipment should be regularly serviced and well maintained.
- Vehicles and construction equipment shall comply with statutory emission standards.
- Tarpaulin will be used to cover stockpiles of soil and other dust-producing materials.
- Providing workers with dust masks to be worn when dust-generating activities take place.
- Construction-related waste will not be allowed to be burned openly.

j) Interference with utilities, blockage of access ways

416. Most new substation locations are accessible from existing village roads or state highway paved roads at distances ranging from 50 to 100 meters. In the case of poor conditions and unpaved access roads used for construction traffic and operational access, the roads will be surfaced with concrete or asphalt to connect the substations with existing paved roads. Construction traffic to and from the sites will be small and intermittent, however big trucks will be necessary for plant and equipment transfer.

417. To safeguard the traveling public and its workers, the contractors will display warning signs and control traffic flows. They will also ensure drivers respect road regulations and travel at a reasonable pace considering the nature of local roads and the number of vehicles involved, among other things. Two weeks before the commencement of the substation access road and distribution line construction, road safety and warning signs must be erected at 500m, 100m, and immediately in advance to alert the public to turn vehicles and the temporary restriction of one lane during pole installation operations.

418. It may be necessary to temporarily interrupt traffic along existing roads in order for electric poles to be delivered to the site from outside. Electric poles and other supplies will be transported via village roads, which are quite narrow. This might create temporary blockage and inconvenience to local residents. Roads with a single or two lanes will be crossed by some portions of the 33 kV wires. Vehicles, such as motorbikes, automobiles, and vans, travel the roadways in residential neighborhoods, posing a particular problem. As the area has limited space for the temporary storage of the concrete poles and materials, the contractor may park trucks carrying these materials on streets. In such a case, there is potential to cause traffic congestion and hazards to commuters using the said road and flagmen should be utilized to warn road users of the situation. All traffic management will need to be done in consultation with the affected communities to ensure they are well aware of likely disruption. In case there is a need for temporary storage, locations to be agreed and any impacts on private land and assets to be compensated in line with the resettlement plan.

419. Scaffolds will be installed to safeguard people, vehicles (and the conductor itself) from potential harm or damage during conductor stringing if road or river traffic is at danger. Public and private facilities will need to be accessible during the construction phase.

420. To minimize adverse impacts of the project on traffic, the contractor will be required to properly plan and execute a traffic management plan in accordance with national regulations and the IFC General EHS Guidelines that is supported by good site supervision.

k) Occupational Health and Safety

421. According to the guidance notes by IFC and the EBRD (2009), the construction of workers' accommodation and its potential impact on communities should be managed in the same way as for construction of the project itself. Impacts need to be identified and may include health and safety, disturbance issues arising from construction, including traffic (dust, noise and vibration), and involuntary resettlement issues (including physical and economical displacement) when the erecting of workers' accommodation entails land acquisition.

422. Ensuring good standards in living facilities is important in order to avoid safety hazards and to protect workers from diseases and/or illness resulting from humidity, bad/stagnant water (or lack of water), cold, spread of fungus, proliferation of insects or rodents, as well as maintaining a good level of morale. The location of the facilities is important to prevent exposure to wind, fire, flood and other natural hazards. It is also important that workers' accommodation is unaffected by the environmental or operational impacts of the worksite (for example noise, emissions or dust) but is sufficiently close that workers do not have to spend undue amounts of time travelling from their accommodation to the worksite. Living facilities

should be built using adequate materials and should always be kept in good repair, clean and free from rubbish and other refuse.

423. Requirements on health and safety are often an important part of building standards and might include provisions on occupation density, minimal air volumes, ventilation, the quality of the flooring (slip-resistant) or security against intrusion.

424. Moderate danger is created to worker's health and safety during the construction of substations and distribution lines of 33 and 11 kV. A health and safety strategy (including Covid-19 hazards) will be developed and implemented by the installation contractor in order to minimize this risk. In situations where dangers cannot be avoided, personal protection equipment (PPE) such as hard helmets and safety gloves/boots should be provided as a last option. While working at heights personal safety measures such as harnesses, tool bags, ropes, etc. will need to be provided. All workers will receive health and safety induction and those working with live electricity and at heights will attend specialist health and safety training to do so following medical check. Untrained workers will not be permitted to work with live electricity or at height. Live lines will be deactivated and properly grounded before work is performed on, or near, to the lines and this will be checked and certified in writing by the contractor's EHS Officer in advance.

425. To accommodate the number of employees on-site, all construction sites must have access to restrooms and handwashing facilities, a hygienic eating space, and covered rest areas. If canned water is not given by an approved provider, the source must be routinely tested to assure it fulfills the drinking water requirements of the state. Existing BREB facilities can be used or, if they are not available, temporary facilities must be provided. Although a construction camp may be necessary, it should be adequately equipped with toilets and handwashing facilities as well as a food preparation area and clean eating area. If the contractor is unable to provide adequate accommodation, existing accommodation facilities should be used as much as possible.

426. When there is an emergency, health facilities may not be able to handle extra patients from the construction crew. First-aid supplies will be provided to employees throughout construction and an ambulance will be ready in case of more serious injuries.

427. The COVID-19 pandemic and other infectious illnesses must be considered while performing H&S risk assessment and planning. A surge in COVID-19 infections will require adequate sanitation and welfare facilities including hand washing and personal protective equipment to be provided both on-site and at the accommodation, as well as consideration for the community's ability to comply with protective measures like regular handwashing. Given the transitory nature of work, particular consideration must be made to workforce accommodation in order to prevent the transmission of any virus among workers and between workers and communities. Given the specialized nature of reacting to COVID-19, public health officials/experts should be contacted during the risk assessment and management planning process.

428. Construction workers' exposure to noise should not exceed the levels set out in the General EHS Guidelines on Occupational Health and Safety otherwise the hearing protection is to be provided.

l) Community Health and Safety

429. The development of the project may have negative impacts on community health and safety, such as the falling of concrete poles, construction traffic and accidents, and emergency spills of liquid chemicals, as well as the transmission of COVID-19 illnesses. It will be advisable to avoid standing water owing to the risk of vector-borne illness. To reduce these possible consequences on the health and safety of villagers, the contractor will be expected to implement the approved community health and safety plan (including COVID-19 measures),

respond swiftly to any grievances, and raise community knowledge of any risks involved. It is the contractor's responsibility to inform impacted communities in advance of any emergency or accident relating to the project, and to involve them in their mock exercises, if suitable, due to the proximity of the project to any of these communities. The contractor's staff will also be given awareness rising in infectious diseases including COVID-19 and a code of conduct at work.

430. Expanding electricity access to rural areas may involve overhead lines traversing farms, villages, and community spaces, increasing the risk of accidental contact. Existing infrastructure might be outdated or damaged, posing potential electrocution hazards if not properly maintained and upgraded. Electrocution can cause severe injuries with lasting consequences, including burns, organ damage, and neurological impairments. Accidental contact with energized lines due to damaged infrastructure, improper access, or lack of awareness can lead to electrocution, impacting individuals and families. BREB is always cautios about thsese potential community health & safety issues so during upgradation works or construction activities exiting electricity will be shut down prior notice.

431. Installation of 4800 km Insulated Conductor is part of the electrification modernization project. Bare conductors are risky for the community. Collisions with overhead power lines are a major threat to birds, particularly large raptors. The insulated conductor design might mitigate this risk compared to bare conductors, but some bird collisions might still occur.

432. Insulated conductors require less maintenance than bare conductors, as they are less susceptible to environmental factors like weather and pollution. Compared to bare conductors requiring a wider safety buffer zone, insulated conductors might allow for a slightly narrower right-of-way. So, the community will not possess any risks for installation of insulated conductors.

433. During transportation of construction materials, some impact may arise for the community as these materials are carried through different types of small and large vehicles. Large trucks on narrow roads can cause congestion and safety hazards. Heavy vehicles can damage rural roads not designed for such loads. Transportation activities can create dust and noise pollution. For BREB's project in Bangladesh mostly seen that all the subprojects' activities are not started simultaneously, and the woks activities are in different contract packages and different components, so many vehicles are not required. PBS will coordinate deliveries to minimize traffic disruptions, like avoiding peak hours. In addition, PBSs choose the routes that avoid densely populated areas or using existing transportation corridors can lessen impact.

434. Rural communities may be vulnerable to the disruptions and impacts of construction due to limited resources and infrastructure. Construction activities around healthcare facilities can disrupt access to essential services for vulnerable individuals. Every PBS will do the construction activities with proper consultation with healthcare personnel and try to avoid any disruption around healthcare facilities during construction.

m) Impact on Indigenous Community

435. During the construction phase of a substation can bring a mix of positive and negative impacts for nearby indigenous communities (Santal & Oraon) residing within a 1km radius. Here's a breakdown of some key areas to consider:

436. Land acquisition for construction could lead to the loss of traditional hunting grounds, agricultural land, or access to natural resources that the communities depend on for subsistence and income.

437. Construction activities can disrupt daily life with noise, dust, and increased traffic congestion. This can affect sleep patterns, social gatherings, and traditional activities.

438. Construction activities and presence of outsiders might disrupt traditional cultural practices and ceremonies, potentially impacting sacred sites or areas of cultural significance. by fostering open communication, implementing proper mitigation measures, and creating opportunities for the indigenous communities to benefit from the project, the construction phase can be managed in a way that minimizes negative impacts and promotes a more sustainable and equitable development process. The following mitigation measures should be considered for IP communities during the construction phase:

- Provide capacity-building programs for the indigenous communities to help them participate effectively in project decision-making and benefit from potential opportunities.
- Conduct a cultural heritage assessment to identify and protect any sacred sites or areas of cultural significance that might be affected by the project.
- Implement long-term monitoring program as identified in the IPP to assess the social impacts of the project on the indigenous communities.
- Careful project siting that minimizes land acquisition from indigenous communities and respects cultural sensitivities can significantly reduce negative impacts.
- Open communication, obtaining Free, Prior, and Informed Consent (FPIC), and involving the communities in decision-making can help mitigate disruption and build trust.
- Implementing measures like dust control, noise reduction, and scheduling construction activities outside peak hours can minimize disturbance to the communities.

439. Unfortunately, gender-based violence and harassment (GBVH) are prevalent concerns in many infrastructure and construction projects, including those undertaken by the Bangladesh Rural Electrification Board (BREB). While bringing electricity access to rural communities offers significant benefits, it can also create situations where women and girls are vulnerable to GBVH. Women and girls may be subjected to verbal harassment, intimidation, and threats of violence. Women may be denied access to jobs, land, or other resources in exchange for sexual favors. Women may be excluded from decision-making processes or denied access to project benefits. Women may not feel safe reporting incidents of GBVH due to fear of retaliation or lack of trust in reporting mechanisms.

440. During construction, benefits to local people can be maximized if the contractor recruit's construction workers locally. However, precedence must be given to ensuring that all workers are appropriately skilled given the hazardous nature of distribution work and so local workers will be limited to few unskilled positions. Wherever possible, the contractor should not discriminate and should proactively encourage the employment of suitably skilled women on the project.

n) Socio-economic Impact

441. As previously mentioned, most of the substation is located in barren land so conduction activity will have a less impact on the socio-economic environment. However, in the case of the nearest residential area the normal lifestyle will be altered for a limited time period. Due to the loss of agricultural land and the rehabilitation of the households, income loss on a smaller scale will happen. Unplanned occupation of roadside land for habitation and commercial purposes could alter the land use of the project area beyond the project-acquired area.

442. During construction activities, local unemployed people will get employment and increase income. The immediate benefits to the poorest residents in the project impact areas include employment in construction activities, and increased income from the petty business

during construction. It is also expected that during the construction phase several other employment opportunities with the contractor's office would be available for local people.

443. The SCADA-ADMS installation system in 5 substations of Rangpur PBSs will not hamper any household or any structure. As this is an automated system, only some cable works and tower installation inside the substation area will be conducted. So, there is no possibility of having socioeconomic loss.

o) Chance Find Procedures PCRs

444. A chance find procedure is a Project-specific procedure which will be followed if previously unknown cultural resources are encountered during Project activities. Such procedure generally includes a requirement to notify relevant authorities of found objects or sites by cultural resources experts; to close off the area of finds or sites to avoid further disturbance; to assess found objects or sites by cultural resources experts; to identify and implement actions consistent with the requirements of ESS 1 and national law; and to train Project workers on chance find procedures.

445. According to a survey within the project area no sensitive receptor or archeological site have been identified. If any person discovers a physical cultural resource, such as (but not limited to) archaeological sites, historical sites, remains and objects, or a cemetery and/or individual graves during excavation or construction phase. The distribution line also does not cross through any reserve forest or sanctuaries.

446. If the chance find has major cultural value, this may entail consequent changes in the lay-out particularly if the discovery is considered or assessed as remains of cultural or archeological importance that is not removable. Mitigation measures for these issues are described in the ESMP.

447. All construction personnel working on the project site, including employees, subcontractors, and their workers will be targeting audience for the encountering archaeological or cultural heritage sites during construction as well as emphasizing the importance of protecting the find and stopping work in the vicinity.

448. Upon discovering a potential chance find, workers should stop working and report it immediately to the site supervisor or designated personnel. These individuals should immediately notify the project manager or environmental officer. They should immediately contact the PIU and report the findings. The PIU will have an E&S consultant who will finally be responsible for handling chance finds and communication with the Department of Archaeology or other cultural heritage agencies.

3. Post-Construction Stage

449. The following is a brief description of impacts envisaged during the Post-Construction Phase:

a) Water Resources

450. The project may lead to faster urbanization near the project area, especially along with proposed new substations/minor route alternatives. This will exert stress on the availability of groundwater in the project area.

b) Ecosystem

451. One of the regular programs to maintain the integrity of the distribution lines is the trimming of tall trees and vegetation along the ROW. This is being done to maintain the necessary conductor clearance of the line.

452. As part of the required conductor clearance distance, private and communal trees and plants up to 3 m in height will be removed or trimmed inside the right-of-way (ROW)[13]. Other big trees within 3 m of the pole bases are being deliberately removed or trimmed during construction to decrease the risk that they will fall and damage the poles, as well. To prevent trees from falling and impacting the lowest conductor, tree clearance or trimming will also be done directly outside the ROW.

453. In order to maintain the integrity of distribution lines, trimming tall trees and vegetation along the right-of-way (ROW) is a regular program. Conductor clearance of the line must be maintained at all times, which is why this is required.

454. There will be a 3 m clearing distance for conductors by removing or trimming private and municipal trees and plants inside the right of way (ROW). During operation, big trees within 3 m of the base of the poles will be selectively removed or cut to limit their propensity to fall and damage these buildings. To prevent trees from falling and impacting the lowest conductor, tree clearance or trimming will also be undertaken immediately outside the ROW.

455. Local residents may experience slight inconvenience as a result of the vegetation care efforts, they may be inconvenient by the vegetation care efforts. By limiting the use of existing roads or tracks to access the distribution lines and alerting the locals to the maintenance plan in advance through village heads, this problem may be addressed to a degree. Workers who will be cutting vegetation should take care not to intrude on the rice or crops of the locals. On completion of cutting and trimming activities, cut vegetation will need to be stored away from human habitation, and any that is not given over to the landowner will need to be disposed of by a licensed waste management operator.

456. Herbicides and insecticides will not be allowed to be used to restrict vegetation growth. Also prohibited is the use of fire to manage vegetation along the right-of-way (ROW).

c) Socio-economic Impact

457. Once there is a reliable power supply, the area will benefit from better economic development. As a result, there will be more employment opportunities as people plan to establish small-scale industries in the area.

d) Risks to Worker Health and Safety

458. Work at heights, exposure to electric and magnetic fields and exposure to live power lines are the main occupational health and safety issues associated with the operation of substations and distribution lines. Some of the dangers that can happen during and after maintenance include explosions, lightning strikes, electrocution, and fires. However, PBSs will always turn off power during maintenance or upgrades to ensure public safety.

459. Potential impacts related to operation and maintenance will be avoided by BREB through the implementation of the following mitigation measures:

- Personnel from BREB's various field offices are the only ones qualified to operate and maintain the distribution lines, substations, and transformers.
- All substations are maintained by BREB-trained staff. All workers on substation sites and responsible for maintenance of distribution lines will receive training through this program.
- When working on power line facilities, BREB should follow the "Environmental, Health, and Safety Guidelines – Electric Power Transmission and Distribution" (IFC) dated 30 April 2007.

[13] https://www.osha.gov/etools/electric-power/overhead-line-work/line-clearance-tree-trimming-operations

- There will be a risk assessment, occupational health and safety plan for substation workers, and maintenance of the distribution lines.
- The risks associated with the COVID-19 pandemic and other communicable viral diseases will receive adequate attention.

460. Some of the prevention and control measures when working with live power lines are:

- Professionals licensed and trained to work on electrical equipment are the only person who should be able to access electronic systems.
- Electrical safety regulations must be followed at all times.
- During maintenance work or if operating close to live power lines, ensure proper grounding and deactivation of the wires.
- Provision of personal protective equipment (PPE) for employees, safety instructions, personal safety devices such as harnesses, tool bags, ropes, etc., and other safeguards are among the safety measures that are required.
- Working along electrical lines, workers will need to follow standards for minimum approach distances when using equipment, vehicles and performing other operations.

461. Working at Heights: Accidents may happen when working in heights. Some of the prevention and control measures when working with live power lines are: (i) Restricting working at height only by workers who are trained and certified to do so, and (ii) Testing of structural integrity before proceeding with the work and the use of fall protection measures such as harnesses, tool bags, ropes, etc.

e) Community Health and fire Safety

Electrical equipment and conductors, as mentioned above, might cause security concerns. Project communities will be subjected to health and safety campaigns by BREB, as part of its regular health and safety processes, prior to energizing lines. BREB is always aware on construction of the substation in an area, and the practice is to construct the substations remotely where the intervention of local people and any households are limited. So, there is no possibility to construct a substation within 50 m from the residential area. If any houses lie within 50m of the substations and along the corridor distribution lines will get posters, pamphlets and safety guides, as well as face-to-face orientation in the villages. In addition to the posters and safety pamphlets, BREB offers a number of internal health and safety programs. Disaster and emergency preparedness plans will also be established and presented not just to BREB personnel but also to the local populations living near the substations and distribution lines, according to the company. In addition to information campaigns, mock drills should engage nearby communities. Power supply is expected to be enhanced in all project locations, giving rise to direct and indirect socio-economic advantages for the people living there.

462. Accidents that may occur during maintenance may involve electrocution, lightning, fires, and explosion. In these circumstances, health and safety issues that may still be encountered by communities living near power distribution lines include electrocution, lightning strikes, explosion and fire.

f) Release of toxic pollutants, Poly Chlorinated Biphenyls (PCBs), SF6, and Asbestos

463. Emission of greenhouse gases from insulators, which use SF6 in high voltage equipment, is a major concern. SF6 has a global warming potential 23,900 times greater than CO2, which needs to be controlled. However, given that the project involves low to medium voltage components and substations are air insulated it is most unlikely that SF6 will be present in the project components. The use of SF6 in fire extinguishers provided at substations should also be avoided.

464. Since PCBs have a high heat capacity and are not flammable, they were widely employed as insulators in capacitors and transformers until the mid - 1990's. They are non-biodegradable and hazardous, thus their usage as insulation materials in electrical equipment has been prohibited across the world. In accordance with the foregoing, BREB has also forbidden the acquisition of equipment (transformers and capacitors as per international good practice) that uses PCBs. To ensure that workers and the public are not exposed to any ongoing hazards, BREB additionally gets confirmation from the transformer supplier at the time of the bid-offer that the provided transformers are free of PCBs. If any PCB-containing transformers remain in-situ, maintenance workers must follow the procedures outlined in the construction section for work involving PCB-containing transformers. Since the practice of using PCB in transformers are already avoided in BREB.

g) Impact on Poverty

465. The high poverty rates in Rajshahi and Rangpur divisions can have a significant impact on the BREB network modernization and capacity enhancement project, affecting both the project's implementation and its potential benefits.

Impacts on Project Implementation:

- **Limited Labor Availability:** Skilled labor for construction and maintenance of the modernized network might be scarce in rural areas with high poverty rates. The project might need to consider training programs or attracting workers from outside the region.
- **Social Conflict:** Lack of proper communication and grievance redress mechanisms can lead to social conflict with communities who feel their land or livelihoods are negatively affected by the project.

Impacts on Project Benefits:

- **Limited Affordability:** Even with a modernized network, low-income households might struggle to afford connection fees or the cost of electrical appliances, hindering their ability to fully benefit from improved electricity access.
- **Limited Capacity to Utilize Electricity:** Rural communities with limited access to markets, storage facilities, or value-added processing might not be able to fully utilize electricity for income generation activities.
- **Exacerbating Inequality:** If the project primarily benefits wealthier households or businesses that can readily afford connection and utilize electricity for productive activities, it could exacerbate existing inequalities within the community.

Potential Solutions:

- **Subsidy Programs:** Consider implementing subsidized connection fees or post-paid electricity schemes for low-income households to make electricity access more affordable.
- **Livelihood Support:** Integrate livelihood development programs alongside network expansion. This could involve training on utilizing electricity for small businesses, promoting efficient agricultural practices that rely on electricity, or establishing cold storage facilities to reduce post-harvest losses.
- **Community Ownership:** Explore models for community ownership or participation in managing the electricity network, fostering a sense of ownership and ensuring benefits are shared more equitably.

466. The social and economic effects of the proposed power distribution project will be favorable. This would assist in boosting economic growth, especially in rural regions of the 16 districts of Rajshahi-Rangpur. It would be most beneficial if BREB recruited locals for unskilled roles, such as substation housekeeping for new 33/11 kV substations, throughout construction

and during operation. It is predicted that the planned initiative would have a substantial impact on poverty alleviation.

C. CLIMATE VULNERIBITY ASSESSMENT

467. Climate change is one of the significant factors considered in the Environmental/Ecological Assessment. Climate change assessment is done for the current assessment process with the objective to provide assurance that climate change implications are being appropriately considered in the design of the proposed project. The specific objectives are to:

- Support the project authority manage or reduce the potential risk posed by the impacts of climate change to the project and contribute to climate change action;
- Provide project managers of the co-financiers with information that will assist their broader climate change action; and
- Help decision makers to address climate change implications in a risk management context.

468. The current assessment is conducted climate change related investigation based on globally and nationally published climate change prediction reports focusing particularly on the variability of rainfall intensity, temperature changes, sea level rise. These variables are directly related to the functionality and durability of the proposed project.

469. To conduct the assessment literature review has been conducted available from different national climate change relevant agencies, such as Department of Disaster Management, Department of Environment and Bangladesh Meteorological Department. International and National Climate Change Communication reports, especially the 5th Intergovernmental Panel on Climate Change IPCC Assessment report has been reviewed for relevant major sources of information for impact and vulnerability projection on global and regional temperature, sea level rise, rainfall fluctuation and their impacts on proposed infrastructures. This climate change projection information will help in making the proposed project climate resilient.

470. A climate vulnerability assessment for substations and distribution projects in Bangladesh is crucial given the country's susceptibility to climate change impacts, including sea-level rise, extreme weather events, and changing precipitation patterns. Such an assessment involves evaluating the potential risks and vulnerabilities associated with climate change and developing strategies to mitigate these risks. Rajshahi and Rangpur divisions are also prone to draught, erosion and sedimentation etc. However, there is no climate vulnerability in these locations due to the proposed project interventions. Project based climate vulnerability assessment and adaptation measures are taken as important considerations during project preparation. Climate vulnerability assessment for the proposed project is given in the following table:

Table VI-2: Possible Climatic hazard for the proposed project

SL	Possible Climate Hazard	Exposure of distribution network	Preventative measures	Vulnerability
1	River Flood	• 314 km electric distribution line in flood prone area. • Substations.	• There are few flood prone area where we have 314 km electric line that will be rehabilitated under this project • Formation Ground Level (FGL) will be kept adequately above the Highest Flood Level (HFL).	Very low

SL	Possible Climate Hazard	Exposure of distribution network	Preventative measures	Vulnerability
2	Erosion	6 sets river crossing tower	BREB constructed the river crossing tower in the stable location of the river to avoid the erosion.	Very low
3	Lightening	Line & Substation	Adequate Grounding will be done	Very low
4	Extreme heat	Distribution line	Use of higher sized conductor.	Very low
5	Extreme cold	N/A	-	-
6	Drought	N/A	-	-
7	Rainfall variability	N/A	-	-

In accordance with climate vulnerability specific funds for climate resilience are allocated. The details breakdown of these cost is given below:

Table VI-3 Specific funds by BREB for climate resilience

Item	Quantity	Cost (MUSD)	Cost (Lac BDT)
Rehabilitation of Electric Line in the flood prone areas	314 km	1.22	1327.07
Use of higher size conductor (#477 to #636 mcm) in the 33 kV new & up-gradation line to reduce system loss at the extreme heat	9861 km	9.28	10104.31
Use of Shield wire (D-2 instead of D1) although in the 33 kV new & up-gradation to protect from lightning	3271 km	0.90	981.28
Increase of FGL for substations	84 nos	0.36	390.77
Use of additional pole to reduce the span length building robust network against cyclone/ storm	19597 km	16.83	18317.96
Others material (Hardware, insulator, x-arm, anchor log etc. except conductor) which is related to the additional pole use	19597 km	23.98	26102.04
Increase of installation cost for additional materials	19597 km	23.77	25867.40
Total (This fund is about 17% of total project cost.)		**76.34**	**83090.84**

1. Climate Change Impact Considerations

471. The impacts consideration assessed the hydro-meteorological parameters that are directly and indirectly exposed to climate change phenomenon for facilitating the detail design and environmental impact assessment process. Projecting the impact of global climate change on any infrastructure/related natural resources requires representation of climate

processes on a variety of spatial scales, from global down to local level. In this regard, under the current scope of works, neither any climatic models nor any hydro-dynamic simulation was newly conducted; rather raw data available from different existing climate and hydro-metric observations and regional projections from different sources were used. The assessment provides some recommendation/potential solutions/mitigation for climate resilient structures based on the findings of the literature review.

a) Climate Projections: Temperature

472. The IPCC 5th assessment report (AR5) indicates that the global mean temperatures will continue to rise over the 21stcentury if greenhouse gas (GHG) emissions continue unabated. Global surface temperature change for the end of the 21stcentury is likely to exceed 2.5°C relative to 1986 to 2005 for all RCP (Representative Concentration Pathway) scenarios except RCP2.6, and warming will continue beyond 2100 under all RCP scenarios except RCP2.6. Table VI-4 shows the projected change in global mean surface air temperature.

Table VI-4 Projected Change in Global Mean Surface Temperature (Likely Range)

Time Period (Base Year 1986 to 2005)	Temperature (°C)			
	RCP 2.6	RCP 4.5	RCP 6.0	RCP 8.5
2046-2065	0.4 to 1.6	0.9 to 2.0	0.8 to 1.8	1.4 to 2.6
2081-2100	0.3 to 1.7	1.1 to 2.6	1.4 to 3.1	2.6 to 4.8

473. On the other hand, for South Asia the report projections indicate that, compared to the average in the 20th century, average annual temperatures could rise by more than 2°C over land in most of South Asia by the mid-21st century and exceed 3°C, up to more than 6°C over high latitudes, by the late 21st century under a high-emissions scenario (RCP8.5); while under a low-emissions scenario (RCP 2.6) average temperatures could rise by less than 2°C in the 21st century, except at higher latitudes, which could be up to 3°C warmer.

474. Even though, IPCC assessment report does not provide any country level projections, under the Comprehensive Disaster Management Programme (CDMP II) of Department of Disaster Management (Ministry of Disaster Management & Relief) acclimate model PRECIS (Providing Regional Climates for Impacts Studies) is used to get climate change scenario for Bangladesh. Table VI-5 shows the projected temperature change for Bangladesh under CC scenario.

Table VI-5 Projected Temperature Change for Bangladesh under CC Scenario

Time Period	Temperature (°C)		
	Annual	Monsoon (Jun-Sep)	Winter (Dec-Feb)
(Base Year 1961-1990, Mean)	24.6	31.83	16.2
2071-2100	4.34	3.43	5.37
2011-2041	1.49	1.50	1.80

b) Climate Projections: Precipitation

475. AR5 reports that, in the long term, global precipitation will increase with increased global mean surface temperature. Global mean precipitation will increase at a rate per degree Celsius smaller than that of atmospheric water vapor. It will likely increase by 1 to 3% / °C for scenarios other than RCP2.6, for RCP2.6 the range increase will be 0.5 to 4% / °C at the end of the 21st century.

476. In the South Asian region AR5 projections indicate that under a high-emissions scenario more rainfall will be very likely at higher latitudes by the mid-21stcentury and over southern areas of the late 21st century. Under a low-emissions scenario, more rainfall at

higher latitudes is likely by mid-century but no likely substantial changes in rainfall patterns at low latitudes. More frequent and heavy rainfall days are projected over parts of South Asia. (IPCC, 2007)

477. Analysis of past trend of rainfall by (CDMP II, 2013) study reveals that all-Bangladesh annual normal rainfall has not changed much in Bangladesh. For a period of 30 years (1980-2009), the annual normal rainfall is found to be 2,306 mm, such rainfalls were 2,298 and 2,314 mm during 1960-1989 and 1970-1999, respectively. On the other hand, Bangladesh normal rainfalls in different seasons show some mixed trend. Pre-monsoon (March-May) and post-monsoonal (October-November) normal rainfalls have increased and the monsoonal (June-September) normal rainfall has decreased over the three time periods (1960-89, 1970-99 & 1980-2009). The winter (December-February) normal rainfall has increased in the last two periods compared to the first period. The change in projected precipitation for Bangladesh, as found by PRECIS run (CDMP II report) is presented in the following Table VI-6.

Table VI-6 Projected Precipitation Change for Bangladesh under CC Scenario

Time Period	Precipitation (mm/day)		
	Annual	Monsoon (Jun-Sep)	Winter (Dec-Feb)
(Base Year 1961-1990, Mean)	3.5	7.24	0.59
2071-2100	0.90	1.43	0.03
2011-2041	0.64	1.40	-0.05

c) Climate Projections: Sea Level Rise

478. AR5 predicted, it is very likely that the rate of global mean sea level rise during the 21st century will exceed the rate observed during 1971–2010 for all Representative Concentration Pathway (RCP) scenarios due to increases in ocean warming and loss of mass from glaciers and ice sheets Table VI-7.

Table VI-7 Global Mean Sea Level Rise (Values Shown as Median and Likely Range)

Time Period (Base Year 1986-2005)	Sea Level Rise (m)			
	RCP 2.6	RCP 4.5	RCP 6.0	RCP 8.5
2020	0.08 [0.06 to 0.10]	0.08 [0.06 to 0.10]	0.08 [0.06 to 0.10]	0.08 [0.06 to 0.11]
2050	0.22 [0.16 to 0.28]	0.23 [0.17 to 0.29]	0.22 [0.16 to 0.28]	0.25 [0.19 to 0.32]
2080	0.35 [0.24 to 0.48]	0.41 [0.28 to 0.54]	0.40 [0.28 to 0.53]	0.50 [0.37 to 0.67]
2100	0.44 [0.28 to 0.61]	0.53 [0.36 to 0.71]	0.55 [0.38 to 0.73]	0.74 [0.53 to 0.98]

479. It is very likely that in the 21st century and beyond, sea level change will have a strong regional pattern, with some places experiencing significant deviations of local and regional sea level change from the global mean change. However, no local level SLR data could be found for Bangladesh based on the AR5 by the current assessment. The potential impact of SLR on the infrastructures of the proposed project described in the following section based on available literature.

2. Potential Climate Impact of the Project

480. To assess potential climate impacts of the proposed project region we have used a web-based tool name 'ThinkHazard[14]' to analyzes and presents the likelihood of various natural hazards like earthquakes, floods, landslides, cyclones, and droughts. The tool incorporates data on how climate change might alter the frequency and intensity of natural hazards in the future. This tool has classified the hazard into four categories: High, Medium, Low, Very Low

Table VI-8 Types of hazards and their magnitude

Type of Hazard	Rajshahi	Rangpur
River Flood	High	High
Urban Flood	High	High
Coastal Flood	High	High
Cyclone	High	Medium
Extreme Heat	High	High
Wildfire	High	High
Earthquake	Medium	Medium
Water Scarcity	Very Low	Medium
Landslide	Very Low	Low

a) Extreme Heat

481. In Rajshahi & Rangpur region extreme heat hazard is classified as high based on modeled heat information currently available to this tool. This means that prolonged exposure to extreme heat, resulting in heat stress, is expected to occur at least once in the next five years. According to the most recent assessment report of the Intergovernmental panel on Climate Change (IPCC, 2013), continued emissions of greenhouse gases will cause further warming, and it is virtually certain that there will be more frequent hot temperature extremes over most land areas during the next five years.

b) River Flood

482. In Rajshahi & Rangpur region river flood hazard is classified as high based on modeled flood information currently available to this tool. This means that potentially damaging and life-threatening river floods are expected to occur at least once in the next 10 years. Model projections are inconsistent in their estimates of changes in rainfall. The present hazard level may increase in the future due to the effect of climate change. It would be prudent to design projects in this area to be robust to river flood hazard in the long-term.

c) Cyclone

483. In Rajshahi region, cyclone (also known as hurricane or typhoon) hazard is classified as high according to the information that is currently available. This means that there is more than a 20%chance of potentially damaging wind speeds in your project area in the next 10 years and in Rangpur region hazard is classified as medium according to the information that is currently available.

d) Landslide

484. In Rajshahi & Rangpur region, landslide susceptibility is classified as low according to the information that is currently available. This means that this area has rainfall patterns, terrain slope, geology, soil, land cover and (potentially) earthquakes that make localized landslides an uncommon hazard phenomenon. Climate change is likely to alter slope and bedrock stability through changes in precipitation and/or temperature.

[14] https://thinkhazard.org/en/report/61363-bangladesh-rangpur

D. RISK ASESSMENT

485. This section identifies the potential impacts that the various elements of the proposed project may have on aspects of the physical, biological, and socio-economic environment. The identification of the potential impacts will be considered for pre-construction, construction, and post-construction phases. The activities undertaken during each of these Project stages form the basis for potential impact identification and analysis.

Table VI-9: Risk Assessment Matrix of the proposed project

Ref. No.	Issues & Impacts	Risk Assessment		Risk Factor	Mitigation & Monitoring Required		Required Controls	Comparison with Regulation
		Magnitude	likelihood		Yes	No		
1.0 Pre-construction Phase								
1.1	Existing aquaculture activities	2	2	4	X		Mitigation measures are already given in the ESMP.	• National Fisheries Policy, 1999 • The Protection and Conservation of Fish Act, 1950 (amended in 1982 • Protection and Conservation of Fish Rules, 1985 • Private Fisheries Protection Act, 1889
1.2	Site clearance	1	1	1	X		Mitigation measures are already given in the ESMP.	• National Land Use Policy, 2001
1.3	Land acquisition/ Purchase	1	1	1	X		Mitigation measures are already given in the ESMP.	• The Acquisition and Requisition of Immovable Property Act, 2017
2.0 Construction Phase								
2.1	Dust Pollution	2	2	4	X		Mitigation measures are already given in the EMP. Soil quality test is proposed for monitoring.	• USEPA office of solid waste and emergency response, hazardous waste land treatment, SW-874 (April 1983, page 273)
2.3	Water resource	1	2	2	X		Mitigation measures are already given in the ESMP. Water quality test is proposed for monitoring.	• Environment Conservation Rules, 1997 • Bangladesh Water Act, 2013 • Bangladesh Water Rules, 2018 • Bangladesh Water Development Board Act, 2000 • National Water Policy, 1999 • Water Resource Planning Act, 1992 • National Water Management Plan, 2001 (Approved in 2004) • National Water Bodies Protection Act, 2000 • Groundwater Management Ordinance, 1985
2.5	Air quality	1	2	2	X		Mitigation measures are already given in the ESMP. Air quality test is proposed for monitoring.	• Environment Conservation Rules, 1997
2.6	Noise generation	2	2	4	X		Mitigation measures are already given in the EMP. Noise level measurement is proposed for monitoring.	• Sound pollution (control) Rules, 2006
2.7	Waste generation	2	2	4	X		Mitigation measures are already given in the ESMP.	• National 3R Strategy for Waste Management, 2010

Ref. No.	Issues & Impacts	Risk Assessment		Risk Factor	Mitigation & Monitoring Required		Required Controls	Comparison with Regulation
		Magnitude	likelihood		Yes	No		
								• Bangladesh Standards and Guidelines for Sludge Management, 2015
2.9	Ecosystem	3	3	9	X		Mitigation measures are already given in the ESMP.	• Environment Conservation Rules, 1997 • National Environmental Policy, 2018 • Bangladesh Biodiversity Act, 2017 • Wildlife Conservation (Protection and Safety) Act, 2012 • National Biodiversity Strategy & Action Plan, 2004 • Biosafety Guidelines of Bangladesh (2007)
2.10	Traffic congestion	3	3	9	X		Mitigation measures are already given in the ESMP.	• The Vehicle Act, 1927
2.11	Socio-economic status	3	3	9	X		BREB will be maintain this issue.	• The Acquisition and Requisition of Immovable Property Act, 2017 • Bangladesh Labor Act, 2006(as amended through July 22, 2013) • Bangladesh Labor Rules, 2015 • National Human Rights Commission Act, 2009
2.12	Community Health and Safety	2	2	4	X		Mitigation measures are already given in the ESMP.	• Bangladesh National Building Code (BNBC), 2015 • Standing Orders on Disaster, 2010 • Biosafety Guidelines of Bangladesh (2007) • Bangladesh Labor Act, 2006(as amended through July 22, 2013) • Bangladesh Labor Rules, 2015 • National Human Rights Commission Act, 2009
2.13	Workers Health and Safety	3	3	9	X		Mitigation measures are already given in the ESMP.	• Bangladesh National Building Code (BNBC), 2015 • Standing Orders on Disaster, 2010 • Biosafety Guidelines of Bangladesh (2007) • Bangladesh Labor Act, 2006(as amended through July 22, 2013) • Bangladesh Labor Rules, 2015 • National Human Rights Commission Act, 2009
2.14	Fire Safety	1	1	1	X		Mitigation measures are already given in the ESMP.	• Bangladesh National Building Code (BNBC), 2015 • Fire Prevention and Extinction Act, 2003

Ref. No.	Issues & Impacts	Risk Assessment		Risk Factor	Mitigation & Monitoring Required		Required Controls	Comparison with Regulation
		Magnitude	likelihood		Yes	No		
								• Fire Prevention and Extinction Rules, 2014 • Bangladesh Labor Act, 2006
3.0 Operation Phase								
3.1	Water resource	2	4	8	**X**		Mitigation measures are already given in the ESMP.	• Environment Conservation Rules, 1997 • Bangladesh Water Act, 2013 • Bangladesh Water Rules, 2018 • Bangladesh Water Development Board Act, 2000 • National Water Policy, 1999 • Water Resource Planning Act, 1992 • National Water Management Plan, 2001 (Approved in 2004) • National Water Bodies Protection Act, 2000 • Groundwater Management Ordinance, 1985
3.2	Agriculture	2	4	8	X		Mitigation measures are already given in the ESMP.	• National Agriculture Policy, 2013
3.3	Fisheries	2	4	8	X		Mitigation measures are already given in the ESMP.	• National Fisheries Policy, 1999 • The Protection and Conservation of Fish Act, 1950 (amended in 1982 • Protection and Conservation of Fish Rules, 1985
3.4	Ecosystem	2	4	8	**X**		Mitigation measures are already given in the ESMP. Tree Plantation is suggested	• Environment Conservation Rules, 1997 • National Environmental Policy, 2018 • Bangladesh Biodiversity Act, 2017 • Wildlife Conservation (Protection and Safety) Act, 2012 • National Biodiversity Strategy & Action Plan, 2004 • Biosafety Guidelines of Bangladesh (2007)
3.5	Waste Management	3	3	9	**X**		Mitigation measures are already given in the ESMP.	• National 3R Strategy for Waste Management, 2010 • Bangladesh Standards and Guidelines for Sludge Management, 2015
3.6	Health & Safety	3	3	9	**X**		Mitigation measures are already given in the ESMP.	• Standing Orders on Disaster, 2010 • Biosafety Guidelines of Bangladesh (2007) • Bangladesh Labor Rules, 2015 • National Human Rights Commission Act, 2009

Ref. No.	Issues & Impacts	Risk Assessment		Risk Factor	Mitigation & Monitoring Required		Required Controls	Comparison with Regulation
		Magnitude	likelihood		Yes	No		
3.7	Fire Safety	1	1	1	X		Mitigation measures are already given in the ESMP.	• Bangladesh National Building Code (BNBC), 2015 • Fire Prevention and Extinction Act, 2003 • Fire Prevention and Extinction Rules, 2014 • Bangladesh Labor Act, 2006

VII. LABOR AND OCCUPATIONAL SAFETY, HEALTH, AND ENVIRONMENT (OSHE)

A. GENERAL

486. The primary objective of ESS-1 as per AIIB on "Environmental & Social Assessment & Management" is to promote sound labour management relationships and enhance the development benefits of a project by treating workers in the project fairly while also providing them with safe and healthy working conditions. Moreover, BREB is awarded with ISO 45001 certification of occupational health and safety management systems which ensures organizational practice of occupational health and safety measures, reduced work-related injuries and illnesses, and create safe working environments. In this regard BREB is always bound to comply health and safety issues in workplace.

1. Impacts on labor

487. The construction of proposed project will entail employment of a huge number of manpower especially during construction stage. The majority percent of labor will be locally hired, with the exception of skilled workers who may not be found in the program areas. For the proposed lines, labor requirements are expected to be low, and the demand are expected to be filled by local labors. However, health hazards, bad living conditions, and unintentional hazardous risks are all possible dangers faced by both hired trained and non-skilled employees, particularly during the building phase. So special attention will be taken by the contactor to reduce such issues.

488. The use of locally available labor is cost effective and socially viable. Local labors create minimum environmental and social risks such as gender-based violence, theft, price hiking of daily used products etc. This also saves the local community from transmitting of any kind of disease. Child labor is strictly prohibited as per GoB's law. BREB will ensure the law of GOB to be enforced properly. The local law enforcement agency is also always aware to stop any kind of violence and social risks.

489. There is no provision for workers family to live in workers camps during project construction period as the workers camps are dedicated for only workers and it is very unusual for workers family to reside with other workers, but there will be some female workers who need adequate sanitation and lactate facilities in workers' camp. BREB is always looked after in this regard. No child labour will also be allowed in construction activities.

490. A Labor Management Plan (LMP) and Occupational Health and Safety (OHS) Plan will be prepared by the respective contractors for proper management of the labors and workers.

491. Potential labor risks:

- Safety issues while at work like injuries/accidents/ fatalities leading to even death, while at work.
- Inadequate accommodation facilities at workforce camps, including inadequate sanitation and health facilities
- Inadequate facilities for pregnant women and lactating mothers
- Short terms effects due to exposure to dust and noise levels, while at work
- Non-payment of wages by Employer.
- Non-payment of benefits (compensation, bonus, maternity benefits etc.) by Employer
- Discrimination in Employment (e.g. abrupt termination of employment, working conditions, wages or benefits etc.)
- Engagement of child labor.
- Health risks of labor relating to HIV/AIDS and other sexually transmitted diseases ✓ Unclear terms and conditions of employment

- Discrimination and denial of equal opportunity in hiring and promotions/incentives/training opportunities
- Denial for workers' rights to form workers organizations, etc.
- Absence of a grievance mechanism for labor to seek redressal of their grievances/issues.

492. To reduce these impacts on labor, few mitigation measures will be adopted through respective authorities and contractor. The following mitigation measures are given below:

- Reduce labor influx into the project area by sourcing all unskilled labor from within and around the sub-project area. If skilled labor is not available locally, it will be imported from outside the sub-project region, either inside or beyond the district.
- Prepare a Workers' Camp Management Plan by the PBS or Contractor that addresses specific aspects of the setup and operation of workers' camps, such as differentiating labor camps from material storage locations.
- Conduct awareness campaigns on HIV/AIDS, STDs, COVID-19, and other communicable diseases.
- Develop a project framework for addressing labor-related concerns.
- Provide information about the Contractor's policies and Worker Code of Conduct to the communities in the sub-project area host communities. This CoC is further expanded to cover the prevention of child labor, forced labor, GBV, SEA and SH

2. GBV Labor Influx

493. Though the project will create substantial number of working opportunities, it is expected that labor influx will not be significant as the construction will be over the period. As all the construction will be conducted in the rural areas, it is expected that skilled and unskilled laborers will be hired locally. The contractor will be responsible for the accommodation of the stay in labor and ensuring labor travel from off site. Some accommodation on site, water supply and sanitation services, etc. will be provided by the contractor. A Labor Management Plan (LMP) and Occupational Health & Safety (OHS) Plan will be prepared by contractors for each project site. However, this labor influx may raise many complex issues, particularly regarding potential transmission risks for COVID-19 both within the worksite and for nearby communities. These risks are not only from workers that are mobilized from abroad or returning from abroad, but also workers moving from other regions, where it is likely that a very few migrant workers are expected to work on the project. Adverse social Impacts due to labor influx can be identified as follows:

- Risk of Social conflict between laborers and community people
- Increased risk of illicit behavior and crime
- Influx of additional population and burden on public services
- Increased risk of communicable disease and burden on local health services
- Local inflation of price and increased pressure on accommodation and rent
- Increased traffic and related accident

B. REQUIREMENTS OF LABOR AND SAFETY, HEALTH, AND ENVIRONMENT (OSHE)

1. Health and Safety

a) Gov't Policies on Labor Management

494. The landscape of labour management in Bangladesh is guided by a framework of policies, laws, and regulations. The central piece of this framework is the Bangladesh Labour Act, 2006, which outlines comprehensive standards for working conditions, wages, and

employee rights. This act is supplemented by the Bangladesh Labour Rules, 2015, which provide detailed guidance on implementing the act's provisions. Additionally, the Occupational Health and Safety Policy, 2013, safeguards workers' well-being by setting standards for safe work environments.

495. Further regulations come from the Public Procurement Rule, 2008, which ensures fair treatment of labourers in government-funded projects, and the National Child Labour Elimination Policy, 2010, which tackles the critical issue of child labour. These policies and laws are enforced by various government bodies, including the Department of Labour, and non-governmental organizations play a crucial role in advocating for worker rights and raising awareness.

496. It's important to note that while this framework exists, challenges remain in ensuring its effective implementation and consistent enforcement across all sectors. Nonetheless, these policies and laws lay the foundation for protecting worker rights and fostering a more positive labour management landscape in Bangladesh

b) BREB's Internal Health and Safety Policy

497. BREB is awarded with ISO 45001 certification of occupational health and safety management systems which ensures organizational practice of occupational health and safety measures, reduces work-related injuries and illnesses, and create safe working environments. In this regard BREB is always bound to comply health and safety issues in the workplace.

c) Health and Safety of Workers and Communities.

498. Community health and safety impacts during the construction and decommissioning of substations and distribution power lines are common to those of most large industrial facilities. These impacts include, among others, dust, noise, and vibration from construction vehicle transit, and communicable diseases associated with the influx of temporary construction labor.

499. Analyze Project workers' labor and working facilities, as well as health and safety threats to populations in the project's vicinity. Implement efforts to provide Project workers with safe and healthy working conditions, as well as measures to prevent Project-related accidents, injuries, and disease. Apply to the Project the necessary occupational health and safety regulations of internationally recognized standards, such as the EHSGs and, where applicable, industry-specific EHSGs. Accidents, infections, and occurrences should be documented and reported. Set up procedures for Project workers to report work circumstances that they believe are unsafe or unhealthy. Put in place preventative and emergency readiness and response measures to avoid, or when avoidance is not possible, to reduce the Project's negative risks and consequences on local residents' health and safety. Set up a system for reviewing occupational safety and health performance as well as the working environment on a regular basis. The Client may, at its discretion, apply appropriate International Labor Organization Labor Standards in accordance with this guideline's requirements.

- Construction camps will be located at least 500 m away from the communities. Entry of the site personnel in the local communities will be minimized to the extent possible/appropriate.
- The contractor will prepare and implement an Occupational Health and Safety (OHS) Plan that will also cover the communities' health and safety aspects.
- The contractor will prepare and implement a Traffic Management Plan that will also address traffic safety for communities.
- The community will be informed about the nature of construction activities and the associated health and safety risks; awareness raising of the communities will be carried out for this purpose with the help of training sessions, posters, signage, and other similar means.
- Awareness raising of communities will be carried out, in a culturally-sensitive manner, about the communicable diseases including sexually transmitted infections.

- Regular safety monitoring will be carried out at the sensitive receptors
- The construction sites will be fenced as appropriate to minimize entry of the local communities, particularly children in the work areas.
- Liaison with the community will be maintained.
- GRM will be established to address community grievances related to health and safety aspects. Residual Impacts even after implementing the above-listed mitigation measures, the health and safety impacts on local communities cannot be fully mitigated. Strict monitoring will be required to ensure that mitigation measures are effectively and strictly enforced.

2. Labor and Working Conditions

a) Labor Management Relationships

500. Provide a sound labor management relations system for project workers, which includes the following, consistent with relevant national law:

- Clear and understandable written terms of employment made available to project workers in an accessible manner at the time of hiring and when any changes are made to the terms.
- Timely payment for project work.
- Adequate periods of rest.
- Timely written notice of termination of the working relationship.
- Employment based on the principles of equal opportunity, fair treatment and nondiscrimination with respect to any aspect of the employment relationship.
- Compliance with national law relating to workers' organizations and collective bargaining.
- An accessible, understandable and transparent GRM for raising Project workplace concerns, including gender-related concerns, that: (a) does not impede access to other judicial or administrative remedies that might be available under law or through existing arbitration or mediation procedures, or substitute for grievance mechanisms provided through workers unions or collective agreements; (b) involves an appropriate level of management and addresses concerns promptly, using an understandable and transparent process that provides timely feedback to those concerned, without any retaliation; (c) is proportional to the nature and scale and the potential risks and impacts of the Project; and (d) allows for confidential complaints to be raised and addressed, including GBV-related complaints; and (e) provides measures to protect against retaliation; and
- A suitable system designed to inform project workers of the GRM at the time of hiring, and which is easily accessible to them.

b) Child Labor and Forced Labor

(i) Child Labor

501. In order to protect children from jeopardy to their health, safety and morals, take all measures required so that children under the age of 18 are not employed for work under the Project. However, if the laws or regulations of the Member in whose territory the Project is located provide, in conformity with the International Labor Organization's Minimum Age Convention, 1973, that children at least 16 years of age may be employed for such work on condition that their health, safety and morals are fully protected and that they have received adequate specific instruction or vocational training in the relevant branch of activity, such children may be employed, but only in conformity with these laws and regulations. In such cases of employment of children under the age of 18 under the Project, conduct an appropriate risk assessment, together with regular monitoring, of their health, safety, working conditions and hours of work.

(ii) Forced Labor

502. Take all measures required in connection with the Project so that no work or service not voluntarily performed is exacted from an individual under threat of force or penalty (including any kind of forced or compulsory labor, such as indentured labor, bonded labor or similar labor-contracting arrangements, or labor by trafficked persons).Assess the risks of forced labor under the Project, and if applicable, include measures in the ESMP (or other Bank-approved document) to address such risks in accordance with this Section.

503. If cases of or or forced labor are identified, take immediate steps to correct them, to prevent similar occurrences in the future, and to facilitate the rehabilitation of victims.

3. Workers' Grievance Redress Mechanism

The Contractor/s of the project has the contractual obligation to establish a separate GRM to address the grievances and complaints reported by the construction workers including the sub-contractors. Grievances/complaints of the workers will be reported to either the site office of the contractor/ or the office of the supervision consultant (if there is such a position). Additionally, a complaint/suggestion box will be placed within the construction site. A focal point to receive and register the grievances and complaints in each of the two offices will be designated, and their contact details will be displayed on the respective office notice boards as well as in appropriate places within the construction site. The availability of the W-GRM to report grievances will be communicated to the workers during worker induction sessions, at periodic meetings of the workers, and through leaflets. The W-GRM will establish (i) clear procedures for reporting and registering grievances; (ii) stipulated time frames for grievance resolution; and (iii) a register to record and track timely resolution of grievances. The contractor is responsible to maintain transparency in GRM operations, secure the confidentiality of the complainants, and avoid any form of discrimination against complainants. The supervision consultant will monitor and report on the processes and outcomes of the grievance redress followed by the contractor.

C. OVERVIEW OF LABOR USE ON THE PROJECT

504. For this project, direct workers and contracted workers are the most applicable, as at this stage, significant community labor is not envisioned for the project. The following are the key categories of workers that would be engaged under the project, including groups of workers that are specifically at risk in the COVID-19 context and thus require special attention.

1. Project Implementation Unit (PIU)

505. The PIU will be constituted by direct project workers who will either be government civil servants engaged in the project or those that will be recruited for the purposes of the project. Specifically, the PIU will comprise: Project Director, Project Coordinator, Procurement Specialist, Financial Management Specialist, Environment specialist, Social Specialist, Monitoring and Evaluation Specialist.

- The Project Director will oversee the project team on the overall day-to-day management and coordination and implementation of the subcomponents of the project.
- The Project Director will also closely liaise with the Task Team from the AIIB and other stakeholders. The Project Coordinator will assist the Project Director to ensure that the works are in line with the objectives of the project and is carried out according to the terms of reference.
- The Financial Management Specialist will assist the project team to lead the financial management activities of the project and coordinate with the technical teams and stakeholders assigned to implement the subcomponents.

- The Procurement Specialist will lead the procurement activities of the project and coordinate with the technical teams and stakeholders assigned to implement the subcomponents. Specifically, the Procurement Specialist will work with the Environment and Social specialists to ensure that all the procurement documents adequately reflect the environment and social issues, where relevant.
- The Monitoring and Evaluation Specialist will lead the monitoring and evaluation activities of the project and coordinate with the technical teams and stakeholders assigned to implement the subcomponents. The Monitoring and Evaluation Specialist will collect, process and manage data, including those relating to social and environment issues associated with the project, as appropriate, from various sources including health management information system, official documents, etc.
- The Social Specialist will lead the social activities of the project and coordinate with the technical teams and stakeholders assigned to implement the subcomponents. Together with the Environment Specialist, the Social Specialist will primarily be responsible for ensuring that project activities avoid or minimize negative social impacts; and where they cannot be avoided, that impacts are identified, and the necessary mitigation measures are developed and implemented following the relevant laws as well as the AIIB policies.
- The Environmental Specialist will lead the environmental activities of the project and coordinate with the technical teams and stakeholders assigned to implement the subcomponents. Together with the Social Specialist, the Environment Specialist will primarily be responsible for ensuring that project activities avoid and minimize negative environmental impacts; and where they cannot be avoided, that impacts are identified, and the necessary mitigation measures are developed and implemented following the relevant laws as well as AIIB's policies.

2. Direct Workers

506. A "direct worker" is a worker with whom the Program/ Project has a directly contracted employment relationship and specific control over the work, working conditions, and treatment of the project worker. Where government civil servants are working in connection with the project, whether full-time or part-time, they will remain subject to the terms and conditions of their existing public sector employment agreement or arrangement, unless there has been an effective legal transfer of their employment or engagement to the project. People employed or engaged directly by the BREB; or the Project Implementing Units (PIUs) on their respective behalf to work specifically in relation to the Project. Direct workers will include the Project Manager/s and respective Supervisors, who are employees of respective IAs, deployed for the BBIN MPA program. The estimated number of direct workers will be decided as per existing institutional arrangements and practices of the respective IA.

3. Contracted Workers

507. All workforce deployed by the Contractors and the Project Management Consultant (for all packages) will be considered contracted employees. The Contractor(s) may also hire multiple sub-contractors and all employees of such sub-contractors will be considered contracted workers as well. Individual consultants with the PIU, people employed or engaged by consultant firms and contractors to perform work related to core function i.e., substations improvement, studies and policy development, engineering design, environmental and social management, training and capacity building, awareness campaigns, volunteer training, and minor infrastructure works, of locations.

4. Primary Supply Workers

508. A "primary supply worker" is a worker employed or engaged by a primary supplier, providing goods and materials to the project, over whom a primary supplier exercises control for the work, working conditions, and treatment of the person. There will be primary supply workers such as those providing aggregates and raw materials for the construction site.

People employed or engaged by primary suppliers of the contractors who would, on a continuous basis, supply goods for the core function of the project. The project will review the involvement of primary supply workers based on the contractors' method of procuring construction inputs.

509. When primary supply workers are engaged, it must be ensured that no child and/or forced labor is involved and OHS requirements for the laborers are followed. Further, if security personnel are engaged in safeguarding project sites and material, the IAs will:

- Make reasonable inquiries to verify that the security personnel employed to provide security are not implicated in past abuses.
- Train them adequately (or determine that they are properly trained) in the use of force (and where applicable, firearms), and appropriate conduct toward workers and affected communities; and
- Require them to act within the applicable law and any requirements set out in the ESMP and there must be signed a Code of Conduct, in comprehensible local language, explained and understood including ramifications for non-compliance.

510. Government civil servants, who will provide support to the Project, will remain subject to the terms and conditions of their existing public sector employment agreement or arrangement unless there has been an effective legal transfer of their employment or engagement to the project.

5. Migrant Workers

511. Migrant workers may contribute to project activity in case of unavailability of experts and labour force in the native country. They often comprise a major part of workforce in Bangladesh, particularly where there is large scale construction/civil works. There is a possibility of having some migrant workers to be engaged in this project as contractors or sub-contractors to carry out civil works and electrical works. There is potential transmission risk of COVID19 both within the worksite and in nearby communities. These risks are not only from workers that are mobilized from abroad or returning from abroad, but also workers moving from other regions.

D. ASSESSMENT OF POTENTIAL LABOR RISKS

512. The labor risks for the project can be defined based on the nature and location where project activities will be carried out. Labor risks, including COVID-19 specific risks, in relation to the activities being carried out by the workers, are described below:

Labour influx	Modernization and enhancement of civil and restoration works are expected as part of the project. Because the project will only employ a small number of external workers, there will be little labor influx. Specific requirements to address hazards connected with labor influx, such as communicable diseases are expected to be modest and will be managed through contractual obligations, code of conduct, and training outlined in this LMP. Under the proposal, male and female workers, persons with disabilities, and other workers from vulnerable groups will be offered equal opportunities for employment, equal wages for equal work, or a standard.
Forced Labor	The "Prevention and Suppression of Human Trafficking Act, 2012" makes debt bondage and forced labor illegal. "Any person who unlawfully forces any other person to work against his or her will, compels to supply labor or services, or holds in debt-bondage to exact from the person any task by using force or other forms of coercion or by threat to do so," the law states. Forced labor, particularly that of local laborers or internal migrants, is a serious offense that must be prevented. The Project will conduct surprise and random inspections on a regular basis to guarantee safeguard compliance.
Labor Camp	Setting up labor camps in project regions might result in land encroachment; also, solid and liquid waste from the labor camp, as well as potential community health issues are the major concerns. During the selection of site for the establishment of the labor camp, it is recommended that it be built away from water bodies, productive land, and settlements. Solid and liquid waste shall not be dumped into bodies of water, and contractors will train staff to keep the camps clean. All employees will be subject to a Code of Conduct that will be strictly enforced. There will be a requirement to raise community awareness about the issue.

Occupational Health and Safety (OHS) and COVID-19 infections	The OHS of those involved in the project is a significant issue as COVID-19 is a highly contagious. Hazards include face-to-face interaction with the general public that increase pathogen exposure, long working hours, psychological distress, fatigue, occupational burnout, and physical and psychological stress. In addition, some infected people may not know that they have become infected and may contribute to the spread unknowingly. Exposure risks can increase for civil workers interacting with individuals with higher risks of contracting COVID-19 and for workers who have exposure to other sources of the virus in the course of their job duties. WHO's COVID-19 OHS Guidelines, AIIB's COVID-19 Considerations in Construction/Civil Works Projects and Public Consultations and Stakeholder Engagement will be referred to minimizing the OHS hazards and risks.
Supply chain disruption	Supply of essentials as well as Project related goods and equipment may be hampered due to supply chain disruption due to COVID-19.

E. ASSESSMENT OF GBV RISKS IN RELATION TO LABOR CAMPS/ INFLUX

1. Gender Based Violence (GBV)

513. Gender-based violence (GBV), including Sexual Exploitation and Abuse (SEA), is a prevalent global challenge and manifestations likely exist in every environment where the Bank operates. Violence against women and children - and sometimes even against men - contributes to enduring physical and mental harm, while undercutting the ability of survivors, and often their families, to engage in meaningful, productive lives.

514. Finding solutions to reduce and respond to GBV is a critical development imperative, with implications for the productivity, agency and well-being of individuals and communities. Identifying and understanding the risk to women and children, as well as to other vulnerable populations, of SEA and GBV is challenging, yet critical. Risk factors are myriad and cut across multiple spheres, including the individual, relationship, community, institutional and policy levels. Development projects, depending on their scope, can exacerbate existing risks or create new ones. Project-related risk factors include the size and scale of a project; the scale of labor influx; the extent to which a community has capacity to absorb labor influx or requires separate camp facilities; the inflow of income to workers, which can exacerbate already existing inequities between workers and community members; and the geographic location of project activities.

2. Gender Analysis

a) Gender and Human Rights

515. BREB will emphasize equity and equality in its entire structure and processes. DoE will provide same facility to access and enjoy the same rewards, resources and opportunities regardless of whether they are women or men employees. BREB will prevent all forms of violence in workplace, including verbal, physical, or sexual harassment.

b) Gender In/Equality

516. BREB has a significant role and strategy to implement the project in line with gender aspect. BREB as a whole takes some remarkable steps to find and implement gender equality activities throughout the organization. We have more than 1200 female employees in almost every sector of work both managerial and operational positions. To ensure women's participation in nation-building we give full privilege to our working ladies. Almost 900 numbers of billing assistants all are female employees, make sure the balance of gender equality in the working environment. BREB also inaugurated a day-care center in its head office complex, to support a working mother. Two full-time doctors are recruited to consult health-related problems for BREB employees. There is a fully independent committee for preventing women's harassment in the office and protecting them from unpleasant working situations. BREB also endorses the objectives of World Bank's South Asia Gender and Energy Facility (SAGE) in its capacity as the Interim-Secretariat of the WePOWER Network and joining as an institutional partner. One of WePOWER's newest partnerships is with Bangladesh Rural Electrification Board (BREB), which serves 28 million people in the country, and provides

energy to almost all of rural Bangladesh. BREB has 30,000 employees with around 5,000 female staff. Since BREB joined the WePOWER network, the rate of female employee participation has increased by 10% through recruitment, pensions and other benefits. Additionally, BREB has reserved the post of billing assistants for women. Enhancing job opportunities for female engineers is a priority for BREB's leadership There is a daycare center at the BREB's headquarters, lessening the burden on mothers in the workforce. At the institutional and policy level, BREB supports the participation of women employees in all technical assignments and capacity building opportunities.

517. Decisions relating to the employment or treatment of project workers will not be made on the basis of personal characteristics unrelated to inherent job requirements. The employment of project workers will be based on the principle of equal opportunity and fair treatment, and there will be no discrimination with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, and gender discrimination.

c) Gender Data

518. This ESIA collect the sex-desegrated data within the 21 PBS. In Bangladesh both man and women are engaged in different project. Like other BREB project this project ensure the gender equity.

d) Gender Context

519. The Project document consider gender dimensions of Bangladeshi social, economic, legal and political contexts differentially affecting men, women, and sexual minorities that would for example highlight patriarchal decision-making structures.

e) Gender Access

520. The proposed project intends to create job opportunities for largely male skilled and unskilled people. It also provides access to woman and sexual minorities.

f) Gender and Care Work

521. This ESIA acknowledge that rural Bangladeshi women are overwhelmingly responsible for supplying household energy through their unpaid, time-consuming labor collecting firewood and other fuels for cooking and other energy needs. Without deliberate measures to alleviate time-consuming unpaid care, women are stymied from participating in income-earning opportunities.

g) Gender Inputs

522. As earlier project intervention by BREB, both man and women were involved in the project activities. So it will be anticipated that both man and women will be involved in any activities at any stage of the Project cycle. This ESIA promogulated both women's and men's equal participation.
523. .

h) Recommendations

524. The Project should:

- Recognize and address Bangladeshi institutional structures that benefit men who have dominant decision-making roles.
- Target women with employment and training to promote Project-related income-generating opportunities.
- Address women's unpaid labor-intensive energy activities including firewood and other fuel collection and caring tasks by providing specific time-saving technology to free women's time up for income- earning activities.

- Include women and men equally in consultations before, during, and after implementation and convene separate consultations for each gender.
- Explicitly identify and address women's and men's differential Project roles and needs.

3. Essential Gender Analysis Checklist

525. This qualitative checklist reveals the extent to which gender-related issues are addressed from a right-based approach. A Gender analysis checklist have been given in the Appendix 10

4. GBV Risk Assessment

526. When considering GBV risks, there are different "areas of impact" that influence both the nature of the risk, and the appropriate mitigation measures that a project can implement. However, due to the nature of the project, GBV risk is not expecte
527. These GBV risks will be assessed throughout the project's life by monitoring the situation, assessing the effectiveness of risk mitigation measures, and adapting them.

5. Action Plan for Gender Based Violence, Prevention and Response

528. The GBV action plan outlines the key measures for prevention, mitigation and response for:

a) The Potential GBV risks to women and adolescent girls (from adjoining communities) as a result of the influx of migrant labor and,
b) Women workers- All categories of project workers: Direct workers, Contracted workers, Migrant Workers, Community Workers and women staff.

529. In this project it is anticipated that the construction work will be executed by contractors whose workers may be local residents and also will come from outside districts. It is likely that the workers will come into contact with the community and vice versa. With varied cultural and economic backgrounds, the likely interactions between communities and workers may lead to potential women safety issues, making it pertinent to create awareness on gender issues, gender-based violence and risk mitigation, in particular. If not carefully managed, an influx of labor in the form of rapid migration and settlement of workers or locals can negatively impact a project area, especially in contexts with high prevalence and social acceptability of violence against women and girls. It is therefore essential to consider labor influxes and gender-based violence when designing risk assessment strategies and mitigation measures.

530. Robust measures are prepared and implemented to address the risk of gender-based violence in the project and adjoining communities. The purpose of the action plan is to identify the issues, stakeholders, possible service providers and assess their capacity and document the legal and institutional mechanisms that aid in accessing grievance redressal. The action plans will focus on sensitizing the communities and other stakeholders and strengthening their institutional capacities. This plan is intended for and applicable to all project implementing agencies, staff and adjoining communities throughout the project cycle.

6. GBV Training

531. To properly address GBV, the training and sensitizing of workers is essential. These workers include civil works contractors (including sub-contractors and suppliers), supervision consultants, other consultants who may have a presence in the project adjoining communities - as well as the IAs. Projects can seek to embed training modules that incorporate GBV into the regular Occupational Health and Safety (OHS) 'toolbox' meetings with workers, official training and/or standalone training efforts. Linking theF curriculum to actors outside the project such as health and education sector professionals may also be beneficial. Training in GBV should be thorough and proportional to the GBV risk. Respective PBS will be responsible for conducting this training. Respective PBS will be responsible for conducting this training.

532. At a minimum, training shall include:

- What GBV, particularly SEA and SH, is and how the project can exacerbate GBV risks;
- Roles and responsibilities of actors involved in the project (the standards of conduct for project-related staff captured in CoCs);
- GBV incident reporting mechanism, accountability structures, and referral procedures within agencies and for community members to report cases related to project staff;
- Services available for survivors of GBV; and,
- Follow-up activities to reinforce training content.

533. As projects are implemented, training on GBV should be made available to project-affected communities so they can learn about the roles and responsibilities of actors involved in the project, processes for reporting incidents of project-related GBV, and the corresponding accountability structures. Training of both project-affected communities and project implementers allows all stakeholders to understand the risks of GBV, as well as appropriate mitigation and response measures.

F. CODE OF CONDUCT FOR WORKERS

534. A Workers' Code of Conduct for this proposed project is essential to ensure the safety, efficiency, and professionalism of all personnel involved in the project. Construction of these substations and distribution line projects can involve various tasks, from wiring installations to maintenance and repairs. Here's a sample Workers Code of Conduct tailored for this proposed project are outlined here:

1. Safety First

- Prioritize safety at all times. Follow all safety procedures and guidelines.
- Use personal protective equipment (PPE) as required, including gloves, safety glasses, hard hats, and hearing protection.

2. Training and Certification

- Only perform tasks for which you are trained and certified.
- Keep your certifications up-to-date.

3. Electrical Codes and Regulations

- Adhere to local, state, and national electrical codes and regulations.
- Stay informed about any code updates or changes relevant to the project.

4. Quality Workmanship

- Perform work with precision and attention to detail to ensure the reliability and safety of electrical systems.
- Double-check all connections and wiring for accuracy.

5. Communication

- Maintain open and clear communication with team members, supervisors, and project stakeholders.
- Report any safety concerns or potential hazards immediately.

6. Tool and Equipment Care

- Properly use, store, and maintain tools and equipment.
- Report damaged or malfunctioning equipment to your supervisor.

7. Worksite Cleanliness

- Keep the worksite clean and organized to prevent accidents and tripping hazards.

- Dispose of waste materials and hazardous substances properly.

8. Emergency Procedures

- Know and understand emergency procedures, including how to shut off power in case of an electrical emergency.
- Follow evacuation plans and assembly points in case of fire or other emergencies.

9. Environmental Responsibility

- Dispose of hazardous materials in accordance with environmental regulations.
- Minimize waste and pollution.

10. Biodiversity Conservation

- During alignment of distribution line finalization, due consideration shall be given to minimize the loss of existing tree cover
- Tree felling, if unavoidable, shall be done only after compensatory plantation of at least two saplings for every tree cut is done.
- The species shall be identified in consultation with officials of forest department/local community, giving due importance to local flora, preferably same species as cut. It is recommended to plant mixed species in case of both avenue or cluster plantation.
- Design of plantation of fruit bearing trees and other suitable trees.
- It should be ensured that plantation is carried out only in areas where water can be made available during dry seasons and the plant can be protected during the initial stages of their growth.
- Place tower footprints away from creek beds and banks.
- Prepare and implement Pest management plan to prevemt pests from entering during construction and maintenance.
- Deploy personnel during construction to minimize disruption to inhabiting fauna.
- Preserve fallen woody material and litter for reptiles and small mammals.

11. Conflict Resolution - Address any conflicts or disputes in a professional and respectful manner. - Report conflicts to supervisors if necessary.

12. Reporting Violations - Report any violations of safety, ethical, or code standards to your supervisor or through the appropriate channels.

13. Professional Appearance - Maintain a professional appearance while on the job. - Wear clean and appropriate work attire.

14. Respect for Others - Treat all team members, clients, and stakeholders with respect and courtesy. - Avoid discrimination, harassment, or disrespectful behavior.

15. Alcohol and Substance Use - Do not consume alcohol or use non-prescribed drugs while on the job. - Be fit for duty at all times.

16. Continuous Improvement - Stay updated on industry best practices and technologies. - Seek opportunities for training and professional development.

17. Integrity - Act with honesty and integrity in all aspects of your work. - Avoid conflicts of interest and report any potential conflicts.

18. Documentation - Maintain accurate records of work performed, including diagrams, test results, and as-built drawings.

19. Accountability - Take responsibility for your actions and decisions. - Learn from mistakes and work to prevent them in the future.

20. Whistleblower Protection - Report any unethical behavior or safety violations without fear of retaliation.

21. Non-Discrimination:

- All project participants must treat each other with respect and dignity.
- Discrimination based on gender, race, religion, disability, or any other factor is strictly prohibited.
- Any discriminatory behavior will be addressed promptly.

22. GBV Prevention:

- We actively work to prevent GBV within the project.
- Awareness campaigns, training, and capacity-building programs will be conducted.
- Reporting channels for GBV incidents are established.

23. SEA and SH Prevention:

- Contractors, staff, and partners must adhere to strict guidelines regarding SEA and SH.
- A clear code of conduct will be communicated to all personnel.
- Reporting mechanisms for SEA and SH incidents are confidential and accessible.

24. Code of Conduct Acknowledgment - All personnel must read and acknowledge this Code of Conduct before starting work on the project.

Failure to comply with this Code of Conduct may result in disciplinary action, up to and including termination.

VIII. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

A. PURPOSE OF PUBLIC CONSULTATION

535. The development and construction of any project will impact on the surrounding human and physical environment and will have beneficial or adverse effects. It is therefore essential that the community can fully understand the project, have the opportunity to express their views and to become directly involved in the project's overall decision-making process.

536. Public authority developers must take account of the community's views and include some useful suggestions to improve the project. This may include suggestions to help further develop environmental protection measures thereby reducing environmental pollution, reducing the loss of environmental resources and improving the project's environmental and social benefits, thus helping achieve more sustainable development.

537. In accordance with the requirements of the AIIB as described in the ESF 2022, the client will engage in meaningful consultation with relevant stakeholders during the Project's preparation and implementation, in a manner commensurate with the risks to and impacts on those affected by the Project. Consultation for this Category B Project should be undertaken in a manner proportional to its risks and impacts. AIIB may participate in consultation activities to understand the concerns of the affected people and to require the Client to address these concerns in the Project's design and ESMP or ESMPF or other Bank-approved documentation.

538. The following activities have therefore been carried out in his project in accordance with the AIIB requirements.

B. INFORMATION DISCLOSURE

539. One of the requirements of the AIIB ESP is the disclosure of information by the client. The bank requires the client to ensure that relevant information about environmental and social risks and impacts of the project is made available in the project area in a timely and accessible manner, and in a form and language understandable to the project affected people, other stakeholders and the general public, so they can provide meaningful inputs into the design and implementation of the project.

540. This documentation includes, as applicable, the following: draft, updated and final environmental and social assessment reports, ESMPs, ESMPFs, resettlement plans, RPFs, Indigenous Peoples plans and IPPFs, other approved forms of documentation and reports required to be prepared by clients under such plans.

541. The Bank also requires the client to disclose any material changes to the disclosed environmental and social information for the project as soon as they become available.

C. APPROACH & METHODOLOGY OF PUBLIC CONSULTATION & DISCLOSURE MEETING

542. A participatory approach was followed in conducting the public consultation meeting (PCM). The study team first had a meeting with the BREB officials responsible for the project implementation to share with them the feasibility and ESIA process of the Modernization & Capacity Enhancement Project.

543. With support from the PBS officials, the union-level public representatives, as well as the key people, were contacted over the telephone and they were informed about the specific consultation meeting and requested them to be present in the meeting. In this process, the venue, date, and time of the consultation meetings were fixed. Later, the study team organized

the meetings at the local level. Names, occupations, and addresses of the meeting participants were noted during the meeting.

544. A number of focus group discussions (FGDs) and several informal discussions were also carried out during the public consultation process. In order to conduct the FGD and informal discussions, five checklists were prepared covering various aspects including an overview of the proposed project, information on the ongoing ESIA process, and seeking information on the problems of the area with their potential solutions. The local needs and demands have been discussed by giving equal opportunity to all participants attending the meeting. During the consultation meeting, all relevant issues about water resources, land resources, socio-economic resources, and disaster aspects were discussed in detail.

545. During the FGDs and PCM, the ESIA team displayed maps of the project area, shared the initial concepts on proposed interventions, and facilitated the discussions to solicit responses from the participants. The stakeholders of the project were asked to share their needs, problems, possible sustainable solutions, and their views on the project interventions. The stakeholders' perceived views on important environmental and social components (IESCs) and the project's impacts on them, along with perceived benefits, risks, threats and demand from the project were identified through these discussions.

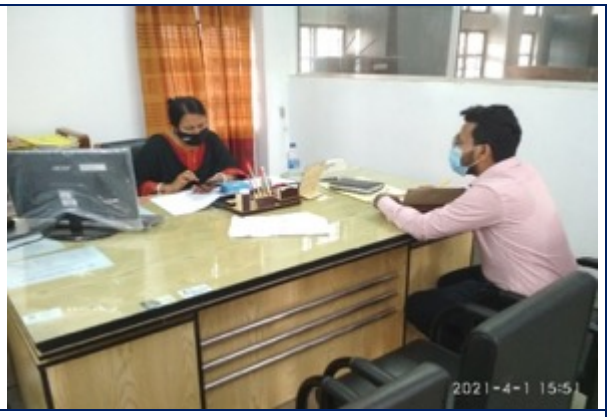
D. CONSULTATIONS DETAILS DURING FEASIBILITY STAGE

546. According to the EIA Guidelines of the DoE, consultation is essential for the ESIA study of every development project. BREB was unable to undertake broad consultations because of the COVID-19 epidemic. Affected people and other stakeholders were informed, consulted and permitted to engage actively in the project preparation process and were made aware of both the good and negative impacts of the project, as a result of the project's preparation. Through the course of the project cycle, consultations will be held with a variety of stakeholders, including the impacted individuals and departments such as the Revenue Department, Horticulture and Agriculture Departments, and local government.

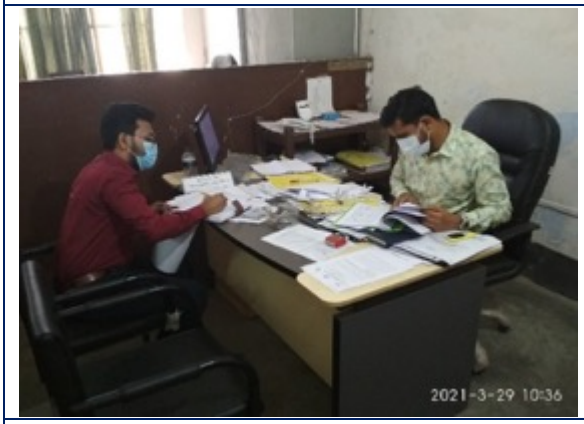
1. Consultations with BREB Officials

547. The project executing agencies will use the comments gained from the consultation conference to revise the technical designs in order to minimize the resettlement impacts. The consultations were also held with several officials of the BREB as well as with the affected persons (APs) in the project areas during project preparation. 08 consultation meetings were conducted in different 21 PBS. The key objectives of the consultation meetings were to disclose the positive and negative impacts of the project to the community and stakeholders as well as to ensure inclusion of views and opinions from project-affected persons about its impacts on their livelihood and wellbeing. Photos of consultation with BREB personnel are given below.

MD.Sultan Nasimul Hoque (GM), Nilphamari PBS



Sima Rani Kundu (DGM, Technical), Joypurhat PBS

	
Eng. Harendra Nath Barman (GM), Dinajpur PBS	*Mostaque Ahmed (DGM, Technical), Thakurgaon PBS*
	
Mohammad Ahsan Habib(AGM), Rangpur PBS	*Md. Pana Ullah (GM), Gaibandha PBS*
	
Md. Shahidul Islam (AGM), Sirajganj PBS	*Eng. Md. Abdul Kuddus (GM), Bogra PBS*
	
Meeting with BREB offcials and AIIB team at Rajshahi PBS	*Meeting with BREB offcials and AIIB team at Rangpur 1 OBS*

**GM-General Manager; DGM-Deputy General Manager; AGM- Assistant General Manager*

Figure VIII.1: Consultations with BREB Officials

2. Consultations with Local People

548. The Focus Group Discussion (FGD) process was designed to recognize any concerns that local communities or other stakeholders may have to detect any potential serious conflicts in the communities. Appropriate mechanisms that incorporate local decision-making traditions to facilitate dialogue and develop consensus on identified issues will be established early in the Project. A total of seven (07) FGDs were conducted at the project areas (figure VIII-.2). The details of the consultations are given in Table VIII-1.

549. Due to the COVID-19 pandemic situation, a large number of people did not participate in the consultation meetings. Public consultations were carried out with groups of people their community-based organizations in the project impact areas for the purpose of disclosing information about the proposed project and its various activities and eliciting their views and concerns. Further public consultation will be organized during the preparation of ESIA.

Table VIII-1: Details of Consultations with Local People

Sl. No.	Location	Date	Time
01	Dhulgagrakhali, Belkuchi, Sirajganj	27.03.2021	11:30am to 12:30pm
02	Khuttapara, Shajahanpur, Bogra	28.03.2021	12:00pm to 12:50pm
03	Mirbag, Kursha, Kaunia, Rangpur	29.03.2021	02:15pm to 03:00pm
04	Kudupukur, Nilphamari	31.03.2021	10:45am to 11:30am
05	Jaborhat, Pirganj, Thakurgaon	31.03.2021	10:00am to 11:00am
06	Birol Rd, Birol, Dinajpur	01.04.2021	11:10am to 11:50am
07	Himci Bazar, Kalai Rd, Joypurhat	01.04.2021	04:20pm to 05:00pm

Figure VIII.2: Consultations with Local Peoples

Table VIII-2: Locations and Number of Participants at Public Consultations

SL	Name of Substations	Locations	Date	Participant	
				Male	Female
Bogra PBS-2					
1	Shajahanpur-2	Khottapara, Shajahanpur, Bogra	28/03/2021	5	0
Rangpur PBS-2					
1	Kaunia-3	Mirbag, Kaunia, Rangpur	29/03/2021	5	0
Thakurgaon PBS					
1	Pirganj-2	Jabarhat, Pirganj, Thakurgaon	31/03/2021	2	0
Dinajpur PBS-1					
1	Birol-2	Ranipukur, Birol, Dinajpur	01/04/2021	4	0

Table VIII-3: Meeting with PBS Officials

SL	Locations	Date	Participant	
			Male	Female
1	Sirajganj PBS-2, Belkuchi, Sirajganj	27/03/2021	3	0
2	Bogra PBS-2, Bogra	28/03/2021	4	0
3	Gaibandha PBS, Tulshighat, Gaibandha	28/03/2021	3	0
4	Rangpur PBS-2, Paglapir, Rangpur	31/03/2021	4	0
5	Nilphamari PBS, Shutipara, Nilphamari	31.03.2021	5	0
6	Thakurgaon PBS, Jagarnnathpur, Thakurgaon	01/04/2021	3	0
7	Dinajpur PBS-1, Uttar Gobindopur, Dinajpur	01/04/2021	2	0
8	Joypurhat PBS, Hanai, Joypurhat	01/04/2021	3	1

3. Consultations with landowner

550. From 27 to 29 April 2024, the AIIB team conducted appraisal missions for the planned substation location. During the mission, the consultant team, along with BREB officials and AIIB team, visited the proposed substation land which had been purchased under Rajshai and Rangpur PBS-1, purchased as well as consulted with the landowners.

Consultation with landowner at Rangpur PBS-1

Consultation with local people at Rajshahi PBS

E. SUMMARY OF THE CONSULTATION MEETING

551. During the public participation of the proposed rural electrification and distribution project, the residents who were questioned highlighted the following issues. Most of the remarks were quite similar to each other. Table XI-4 provides an overview of the consultation meeting.

1. Positive Issues

Improvement of Local and National Economy

552. By boosting the gross domestic product, using locally accessible materials throughout the building phase of the planned subprojects will contribute to economic growth. The purchase of substation construction materials, as well as the eventual increased consumption of electricity, will attract taxes, such as VAT, which will be paid to the government, increasing government revenue, whereas the cost of raw materials will be paid directly to the producers, reducing government revenue.

Improved Electricity Supply

553. The project aims to improve the distribution of electricity and retail sales. Power outages will be minimized, and residents won't be subjected to power rationing, the neighbors were confident. In addition, they believed that power fluctuations and surges would become

obsolete. Because of these new sources of electricity, the country and local area are expected to attract more investment.

Boosting of the Informal Sector

554. It is expected that other businesses in the informal sector will thrive during the construction, operational, and decommissioning phases of the proposed subprojects. These include activities such as food vending, which will benefit directly from the construction, operational, and decommissioning staff members who will be purchasing food and other commodities from them. This will help the informal sector secure some temporary revenue and thus a livelihood.

2. Negative Issues

Accidents during Construction

555. During the construction, implementation, and decommissioning of the project, several people feared that worker accidents may occur. However, they believed that safety measures would be put in place to prevent accidents from occurring. Road safety measures and increased vigilance would be promoted among the carriers of the project materials to the project locations.

Increasing Noise Level and Vibration

556. The likelihood of excessive noise and vibration levels on the project site as a result of construction activities was a cause of concern. However, the proponent must make reasonable efforts to reduce noise generation, such as ensuring that all construction equipment is in good working order.

Increasing Emissions (Air Pollution)

557. During the construction and decommissioning phase of the proposed subprojects, there will be undesirable emissions that will be emitted, especially from heavy machines that could be used for construction and decommissioning. Dust will be emitted during the construction and decommissioning phases. Neighbors asked for air pollution control measures to be put in place, especially during construction.

Table VIII-4: Summary Findings of the Public Consultation

Issues Discussed	People's Views and Perception	Feedback
General perception about the project	A large number of participants said that they had heard of the proposed project. General consensus was that the project was highly important for a regular and adequate power supply with correct voltage, as well as a regular and sufficient power supply. Students will benefit from the initiative, since they will have access to power throughout the nighttime hours for studying.	General people are well aware of this project. They are expecting that this project will enhance the quality of power supply
Support of local people for the proposed project	All the participants decided to support the proposed project without hesitation, since it would address their electrical problems and make their lives a little better. During the consultation, participants noted that there are no small-scale enterprises in the region because of the inadequate power supply. Once there is a reliable power source, the area's economic development will improve. In the future, people will start thinking about building small-scale industries in the region.	These projects can boost the local and national economy as the electricity production will increase and the system loss will be reduced.
Support and participation during project implementation	All the participants during the consultation expressed that they would extend unconditional support to the project and participate during the implementation of the project as and when required.	Support from community level can increase the quality of the construction work
Critical issue and concern by the local people for the project	During the meeting, local residents raised a number of concerns about the project. One major concern expressed was the safety of the nearby residential population as a result of the substation installation. They highlighted the	Most of the people arise their concern regarding environmental pollution like dust, noise during

Issues Discussed	People's Views and Perception	Feedback
	issue of timely construction of the proposed substation in some areas since there is a lot of dust and noise pollution for the local community during construction.	construction work. Mitigation measures will reduce the adverse effect.
Criteria to be considered during project design, construction, and operation stage	During the consultation, a small number of participants advised that the planned substation should be at least 3 to 4 kilometers away from the residential population. In certain places, individuals have stated that a fence surrounding the project site is necessary for safety, and that current techniques should be utilized to decrease noise pollution. Some proposed that for safety there should be a safety wall with a guard facility.	Most of the substations site are far away from local community and BREB always conscious regarding these issues.
Environmental Issue	There is no environmental sensitivity at the project site, according to participants in the consultation. However, they were extremely optimistic about the project, since it will help the socio-economic growth in their region. During the building phase, they were concerned about noise and air pollution.	No sensitive receptor was identified throughout the project boundaries.
Willing buyer and willing seller issues	On consultation, majority of landowners said that they wanted financial compensation at the market rate for land lost due to substation construction, while the majority of those who did not state that desire. They asked for appropriate compensation for the loss of trees and crops and were granted their request. Some locals felt that in addition to monetary compensation, a member of each affected family should be provided with labor or a job throughout the building period.	To construct substations some land may be needed. So, if the landowner is willing to sell their land BREB shall buy these land at actual market price
Status of current electricity supply	During the consultation, the respondents stated that power is only accessible for 12 to 14 hours each day. Occasionally, there are power outages owing to load shading, and voltage fluctuation occurs. When there is a lot of wind and rain, the energy supply is quite low. Electricity is only accessible for 7 to 8 hours a day in certain regions, and during the rainy season, the supply is much less.	There is still system loss in the project areas. Modernization & Capacity Enhancement project will reduce the system loss
Perceived benefits from the project	As a result of new substations being constructed, the energy supply to villages is expected to rise and voltage fluctuations will be reduced, according to almost all of the consultation participants. They pointed out that, in the future, the enhanced electricity supply will be able to fulfill the power demand of small-scale companies, which in turn will generate jobs for local residents. In the evenings, students would benefit from having access to sufficient power for studying and other learning activities.	Increased and enhancement of electricity supply would be able to fulfill the power demand of small-scale companies, which in turn will generate jobs for local residents.
Perceived loss	Almost all the villagers felt that there are no such negative impacts from this proposed project. Though there are some perceived losses these are very minimal as they feel that there could be disruption of agricultural activities during stinging of feeder line or loss of crops if not avoided	As there are no major resettlement issues in this project, people of the project areas are feeling relax.
Safety issues	Almost all of the villages highlighted the problem of safety as a result of the substation building. The participants stated that there would always be dread in their minds while they are near the substation. Fencing surrounding the project site is essential for safety, and contemporary techniques should be utilized to decrease noise pollution. Some commenters recommended that a safety wall be built around the substation, complete with a guard post. It has been said that the substation perimeter would be continuously gated and that there will be no inflow of people within the s/s limit. The necessary safety measures will be implemented to ensure the safety of the local residents.	BREB, Contractors, PIU are always aware of the safety issues of the worker. As before, all the project taken by BREB were meet the proper health safety guidelines. So in this project it can be said that proper safety issues will be maintained in this proposed project.
Usefulness of consultation	Since Local residents had an opportunity to express their thoughts and concerns about the proposed project, they agreed that the discussions were extremely informative and useful. As a result, local residents are in need of regular updates on the project's development.	Local people and all the stakeholders who have attended the consultation express their thoughts with consultants.
Labor management during	As the construction period approaches, most participants are concerned about the migrant workers, who may spread	As COVID-19 strike throughout the world. It is

Issues Discussed	People's Views and Perception	Feedback
COVID	the COVID virus to the workers. They advocated for as much use of local labor as feasible. To prevent the COVID virus from spreading, they have also advised the following: (1) controlling entry/exit to the site, securing the site's boundaries, and designating entry/exit points; (2) training security personnel on the (enhanced) system in place for securing the site and controlling entry and exit, the behaviors required of them in enforcing such system, and any COVID -19 specific considerations; (3) Worker fitness must be verified before workers access the site or begin work. Workers with underlying health concerns or who may be at risk should receive special attention; and (4) Temperatures of laborers and other persons entering the site should be checked and recorded; self-reporting is required before entering the site.	mandatory to combat with COVID-19 in the workplace. So, all precautionary measures have to be maintained in workplace.

F. INFORMATION DISCLOSURE

558. Local people must be able to access, read and understand all subprojects, environmental impacts related to subprojects, suggested mitigation/enhancement measures, and the EMP for managing mitigation/enhancement measures. Information should be made available to the local people and to the relevant stakeholders of the respective subproject under the proposed project by the respective authorities of the project (e.g., the BREB). The disclosure was also published in BREB website as well as local newsprint and electric media.

559. As per the information disclosure processes, BREB has also arranged a workshop on 15 May 2024 through online platform regarding ESIA and RPF where total 82 participant including GM/SGM of all respective PBSs and other officials were present. The consultant presented specific findings along with suggestions on the environmental and social aspects of the RPF and ESIA which will leading to fruitful implementation of ESMP and RPF.

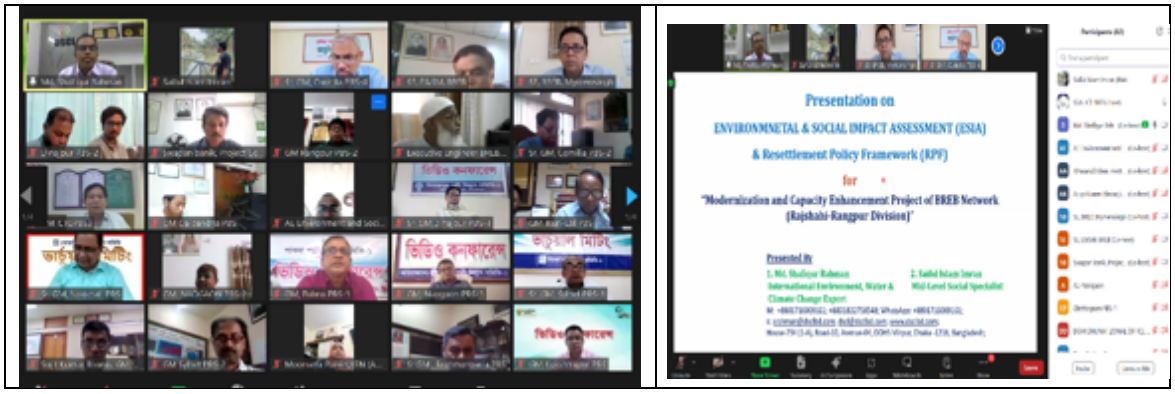


Figure VIII.3: Workshop with each PBS & BREBs officials.

IX. ENVIRONMENTAL & SOCIAL MANAGEMENT PLAN (ESMP)

A. GENERAL

560. Environmental mitigation measures and environmental monitoring requirements will be implemented through an Environmental and Social Management Plan (ESMP). The ESMP provides details of the environmental impacts, environmental mitigation measures, environment monitoring requirements, and environmental supervision responsibilities.

561. Its primary objective is to minimize, eliminate, or reduce negative environmental impacts through possible mitigation measures, while enhancing positive impacts through enhancement measures. Mitigation measures are designed either to prevent impacts or by mitigating those to reduce the negative impacts to an acceptable level that complies with the environmental guidelines of the DoE.

B. OBJECTIVES OF ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

562. Environmental and Social management plan (ESMP) is prepared for all the identified environmental impacts (as illustrated in Chapter VI) during pre-construction, construction and operation stages due to implementation of various Project activities and associated development. The ESMP includes a mitigation plan, monitoring plan and environmental cost.

563. The aim of the ESMP is to ensure implementation of the recommended mitigation measures effectively. The mitigation measures are designed either to prevent impacts or by mitigating those to reduce the effect to an acceptable level that complies with the environmental guidelines of DoE and with the guidelines of the AIIB's ESF (2021) by adopting the most suitable techno-economic options. The ESMP also ensures that the positive impacts are conserved and enhanced. The main objectives of the ESMP for the project are:

- Define the responsibilities of the project proponents in accordance with the three project phases (design, construction and operation);
- Facilitate the implementation of the mitigation measures by providing the technical details of each project impact and proposing an implementation schedule of the proposed mitigation measures.
- Identify training requirements at various levels and provide a plan for the implementation of training sessions.
- Identify the resources required to implement the ESMP and outline corresponding financing arrangements; and
- Providing a cost estimate for all proposed ESMP actions.

C. ENVIRONMENTAL & SOCIAL MITIGATION MANAGEMENT PLAN

564. Mitigation measures for each of the impacts listed in Table IX-1. Responsible institutions/departments for the implementation and supervision of each of the environmental issues have also been illustrated. Mitigation measures have been suggested based on the knowledge of the Environmental Specialist, suggestions of the stakeholders collected during public consultation, and opinions from other relevant specialists. For the execution of this project, all the project components are enlisted into two contracts, one is turn-key contract, and another one is line-contract. A turnkey contract is a comprehensive agreement where the contractor takes full responsibility for all aspects of a project. For complex projects like building a new substation, a turnkey contract might be preferable due to its simplified management approach. For this project the line contract belongs to BREB, and the turn-key contract belongs to AIIB. The ESMP table has been spit out for turn-key contractor and for the line contractor.

565. In prior to detailed design, DED consultant will work with E&S consultant on these environmental & social issues identified in ESIA, then the DED will be finalized.

566. The mitigation measures will be considered successful when complying with the Environmental Quality Standards (EQS), policies, legal requirements set by DoE and other relevant GOB organizations. In the absence of DoE's own EQS, other relevant international or other recognized organizations' quality standards will have to be followed.

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Table IX-1 :Environmental and Social Management Plan for the for the Turn-key Contract

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
A	**Pre-construction Phase**					
A.1	**<u>Land purchase/Acquisition.</u>** ▪ Loss of Agricultural Land ▪ Cultural, historical and Aesthetic Loss ▪ Loss of sensible places ▪ Corruption and partiality during land purchase.	▪ Avoid the important environmental and social sensitive areas, such as protected forest reserves, settlements, archaeological and cultural sites etc. when route alignments are selected ▪ Place priority in selecting unencumbered land belonging to the government (located adjacent to the road) ▪ Avoid the important environmental and social sensitive areas, such as protected forest reserves, settlements, archaeological and cultural sites etc. when route alignments are selected ▪ Place priority in selecting unencumbered land belonging to the government (located adjacent to the road) ▪ Lease/purchase private land with the full consent of the landowners if such government land is not readily available. ▪ Maintain full transparency in private land transactions and ensure that land is leased/purchased with free and informed consent of the respective landowners. ▪ Ensure that negotiations with landowners and agreements reached to lease/purchase the land is monitored and documented by independent third party. ▪ Ensure that land prices are determined at prevailing market prices ▪ Provide additional assistance for vulnerable landowners.	Proposed Substation Land & RCT locations	Throughout the pre-construction period.	PBS/BREB	DSC/ BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
		▪ In managing the remaining purchase land, relevant stakeholders will be consulted and engaged as proposed in the Stakeholder Engagement Plan. In addition, in cases of impacts on livelihood, rehabilitation through appropriate skill training/financial counselling would be required. ▪ Finally, most of the land will be purchased through "willing buyer willing seller method" by PBS. Concerns and the needs of vulnerable groups will be addressed through a mix of measures that includes additional assistance. ▪ Phase 1 Environmental Site assessment (ESA) should be conducted for all the existing substations, and any further recommendations arising from the findings of the Phase 2 ESA will be done by BREB. ▪ AIIB will provide input to the Phase 1 ESA Term of Reference, in choosing the consultant, and reviewing the Phase 1 ESA findings and recommendations which will be implemented by BREB.				
A.2	**Disruptions to other utility services and assets** ▪ Prior to construction, the BREB will obtain clearances and permits for power distribution infrastructure from agencies including the Forestry Dept., the Department of Railways & Roads & the Department of Telecommunications, as well as, if applicable, from aviation authorities.	▪ Upgrading of existing substations will be done within their existing premises; hence no additional land is required. ▪ Obtain necessary clearances consistent with the requirements of Government of Bangladesh from other utilities and asset owners such as Forestry Dept., the Department of Railways & Roads & the Department of Telecommunications, aviation authorities prior to the commencement of civil works. ▪ Relocate all public utilities (e.g., water pipes, gas pipes, power/telephone lines)	Proposed Substation Land & RCT locations	Throughout the pre-construction period.	PBS/BREB	DSC/ BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
		that may be affected prior to the commencement of civil works ▪ Allocate sufficient funds for the relocation of utilities ▪ Prepare and obtain BREB's approval for the Traffic Management Plan for roads as well as for the river to avoid any disruption to existing road assets, vehicular movements and inconveniences to road commuters				
A.3	**Agricultural Resources** ▪ Construction activity may have an impact on agricultural land and crop production, though most of it will be for temporary period only ▪ Project vehicle movements in dusty areas may infect tree leaves by depositing dust and smoke and affect the photosynthesis rate until sprayed with water properly.	▪ Crop compensation will be provided if any crops will be affected. ▪ Provide compensation for crops and trees that will be affected by civil works ▪ Provide employment opportunities in civil works for families whose agricultural activities are temporarily disrupted due to civil works ▪ Avoid/minimize impacts of dust and smoke emissions on nearby crops, cultivations and trees.	Proposed Substation Land	Throughout the pre-construction period.	BREB	DSC/ BREB
A.4	**Cutting or trimming of trees and vegetation** **Loss of trees** ▪ Loss of standing crops (if any), grass and bushes of substation sites and construction camp sites	▪ Ensure that felling or trimming of any trees are undertaken only when it is essential such as for safety clearance requirements. ▪ Obtain prior approval from the Forest Department for felling/trimming trees around the protected or forest areas reserves ▪ Provide compensation for any loss of fruit-bearing trees that have economic value . ▪ Schedule the times for tree felling/trimming to avoid the breeding seasons of the birds. ▪ Ensure that any tree replanting programs are conducted without any disturbances to the project activities.	Affected substations land as per land audit	Throughout the pre-construction period.	Contractor	DSC/ BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
		▪ Select the plant species varieties that would restore the lost territorial flora and fauna habitats. ▪ Provide adequate compensation to the owners in a timely manner prior to the commencement of clearing the vegetation.				
A.5	**Flora and Fauna** ▪ Disturbance of wildlife specially birds due to project activities such as earthworks, moving of project equipment and transports.	▪ In prior to construction, Biodiversity Screening Framework and detail biodiversity screening assessment should be carried out after finalization of all DL route and detail design to identify potential impacts on biodiversity early in the planning stage. ▪ Providing training to the worker for maintaining the Code of Conduct for the workers.	Existing and Proposed Substations location	Throughout the pre-construction period.	BREB	DSC/ BREB
A.6	**Socio-economic conditions** ▪ Employment opportunities for the local people especially for PAPs.	▪ Provide employment for local people, specially PAPs for the project activities as much as possible. ▪ Utility infrastructure relocation will be considered in the design and budgeting process. ▪ Substations must be designed so that their noise levels do not exceed the statutory limits for residential areas, which are set by law.	Existing and Proposed Substations location	Throughout the pre-construction period.	Contractor	DSC/ BREB
A.7	**Encroachment into ecologically sensitive areas** ▪ The proposed project site is located in a plot area earmarked for Industrial development. There is no encroachment of sensitive habitats like protected forest areas or terrestrial wildlife sanctuary habitats.	▪ For tree cutting/trimming outside protected or forest areas obtain approvals from forest department as per national regulatory framework, approvals are required. ▪ Ensure that no work shall be undertaken, and no temporary or permanent project facilities are established within the designated protected areas, IBA, reserve forest area, or sacred grave etc.	Existing and Proposed Substations location/ RCT locations	Throughout the pre-construction period.	Contractor	DSC/ BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
A.8	**Occupational Health & Safety** ▪ The construction of substations and river crossing tower pose some risk to the health and safety of workers.	▪ Conduct a workshop to assess the OHS risks with the participation of the contractor, BREB, and project implementation agency. ▪ The risk assessment should be undertaken through a facilitated risk assessment workshop involving the contractor, BREB, and project implementation agency. ▪ Place the garbage containers for the disposal of garbage generated by workers (as rubbish burning is forbidden). ▪ For any BREB stationed at the substation (typically little more than 2 or 3 people), a drinking water supply that satisfies drinking water requirements must be supplied.	Existing substations, Proposed substations, River Crossing Tower, Fault Locator	Beginning of construction period.	Contractor	DSC/ BREB
A.9	**Community Health & Safety** ▪ The substation itself carries risks as it controls power. There is always a risk of accident and shock. Although people do not know about risks in new substation locations, they imagine that power can cause accidents if there is no proper management.	▪ Prior to construction work, the contractor will be required to develop a community health and safety risk assessment and plan. ▪ The risk assessment should be undertaken through a facilitated risk assessment workshop involving the contractors. ▪ Community health and safety measures e.g., fencing and signage will be incorporated into the detailed design. ▪ Engagement of stakeholders for decision making and aware them about project components.	Proposed Substation, River Crossing Tower, Fault Locator	Beginning of construction period.	BREB/ Contractor	DSC/ BREB
A.10	**Drainage** ▪ Raising the transformer platforms in substations up to 2 ft above the highest flood level can create a barrier, potentially forcing floodwaters to divert to lower-lying areas downstream.	▪ Design a drainage system for the raised substation site to manage stormwater runoff effectively and prevent ponding. Integrate this system with the existing drainage network to minimize disruption. ▪ Integrate this system with the existing drainage network to minimize disruption.	Proposed substations and existing substations	During detailed design stage; always prior to construction	BREB/ Contractor	DSC/ BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
	▪ The raised site can disrupt the natural drainage patterns, leading to waterlogging in nearby fields.	▪ Implement soil conservation practices like topsoil stockpiling and proper compaction control to minimize soil damage during construction. ▪ Develop a plan for handling stormwater, domestic wastewater, and contaminated water according to local regulations.				
A.11	**Hazardous Material, Waste Management & Potential Legacy Contamination** ▪ Transformers are one of the most common forms of industrial hazardous waste, containing metals toxic to human health and the environment. ▪ Other equipment also releases chemicals and gases that are harmful to environment and Human health.	▪ A proper stormwater management plan is essential. This could involve installing drainage channels, detention ponds, or using permeable materials to allow water infiltration. If the substation generates any domestic wastewater (e.g., from toilets or sinks), a septic system or connection to a municipal sewer system might be needed, depending on local regulations ▪ Prepare a plan for handling any potential leaks of transformer oil or other contaminants. ▪ All transformer oil bought will be tested for PCBs as part of BREB's internal procedure.	Proposed substations and existing substations	During detailed design stage; always prior to construction	BREB/ Contractor	DSC/ BREB
A.12	**Proximity of Sensitive Receptors/ Indigenous Community** ▪ Substation construction and operation can disrupt traditional cultural practices and sacred sites if not carefully planned. ▪ Land acquisition led to loss of traditional hunting grounds, agricultural land, or access to natural resources for the indigenous communities	▪ Prepare Indigenous People Plan (IPP) and Indigenous People Plan Framework (IPPF) that covers the various factors like project design, community engagement, and mitigation measures implemented ▪ FPIC from the affected indigenous communities before proceeding with any construction activities. This involves transparent communication, ensuring communities understand the project's potential impacts and have a say in the decision-making process. ▪	Proposed substations and existing substations	During detailed design stage; always prior to construction	BREB/ Contractor	DSC/ BREB
B	**Construction Phase**					

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
B.1	**Land and agricultural resources.** ▪ Unanticipated impacts on the property including land and structures ▪ Loss of agricultural land causes a temporary disruption of farming activities, damage to crops, bunds, canals and drains.	▪ Follow design drawings and implement careful construction practices to avoid damage to existing structures (e.g., buildings) and roads, crops, bunds, canals and drains. ▪ Defining the work zone and preventing incursions outside the agreed-upon impact corridor. ▪ Avoid fertile land cultivated with two or more crops, or land with such potential. ▪ Place priority on selecting non-agriculture khash land if available. ▪ Retain the most productive lands in the surroundings where the soil conditions are suited for agriculture production. ▪ , Install a drainage system during the rainy season to drain surplus water. ▪ Restore the irrigation and drainage systems to ensure continuity of the agricultural activities. ▪ Encourage the farmers to use shallow and deep tube wells for irrigation to cultivate Boro rice and Rabi crops. ▪ Install deep tube wells for irrigation of winter cropping areas. ▪ Provide adequate spaces for the movement of cattle and agricultural machinery.	Proposed Substations, River Crossing Tower locations and construction camp	Throughout the construction period.	Contractor	DoE/ BREB
B.2	**Interference with traffic and accessways** ▪ Stockpiling of poles, spoil and cable reels can cause the block	▪ Maintain safe access to public and private properties and roads ▪ Provide alternative routes and accesses if there are temporary diversions or blockages. ▪ Ensure that stockpiling of poles, spoil and cable reels are located far away from public and private properties and only in designated areas	Construction areas and Route of material movements	Throughout the construction period.	Contractor	DoE/ BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
B.3	**Soil erosion** ▪ Soil erosion during substation construction & Tower construction.	▪ Ensure that excavations for substations are y carried out within the boundaries of the substation sites. ▪ Avoid/minimize unnecessary removal of existing vegetation and topsoil. ▪ Use the removed topsoil to restore the surface of excavated areas.	Proposed substations land and tower location/ Construction camp	Throughout the construction period	Contractor	DoE/ BREB
B.4	**Ecosystem /Cutting or trimming of trees.** ▪ Loss of Trees on substation land and tower location.	▪ No temporary or permanent projects shall be undertaken or established within a protected area, IBA, reserved forest area, or sacred grave etc. ▪ Avoid felling of mature trees As much as possible ▪ Demarcate of the working area and avoid encroachments outside the defined corridor of impact. ▪ Ensure that felling or trimming of trees are carried out only to meet the design requirements and for safety clearance requirements. ▪ Compensate for the unanticipated loss of fruit-bearing trees that have economic value f r ▪ Consult the Forest Department and obtain its approval prior to the removal of all public trees their replacement with native tree species. ▪ Ensure that contractor's EHS officer checks for presence of nesting birds or roosting bats. ▪ Avoid tree felling/trimming during bird nesting/breeding seasons. ▪ Inventorize trees to be felled or trimmed prior to beginning land clearing work at substation sites and along RCT locations. ▪ Compensate the affected public trees through compensatory afforestation in	Proposed substations land and tower location/ Construction camp	Tree plantation programme will be conducted quarterly	Contractor	DSC/ BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
		accordance with forest department rules. ▪ Conduct a Critical Habitat Assessment (CHA) prior to any construction activities in areas where CR and EN species were found.				
B.5	**Biodiversity** ▪ Clearing vegetation for construction can fragment wildlife habitats, disrupting animal movement and breeding patterns. ▪ Food scraps and waste from construction camps can attract scavenger animals, potentially increasing human-wildlife conflict. ▪ Disturb birds and other wildlife due to stringing operation of power line particularly during breeding seasons	▪ Clearly demarcate construction boundaries and establish buffer zones around sensitive habitats. Minimize vegetation clearing within these zones. ▪ If construction fragments habitats, consider creating wildlife corridors (e.g., green bridges over roads) to allow safe animal movement. ▪ Implement security measures like fencing, patrolling, and controlled access to prevent unauthorized entry and poaching activities. ▪ Work with local communities to raise awareness about the importance of biodiversity and encourage their participation in conservation efforts. ▪ Avoiding stringing of power line during breeding seasons or establishing buffer zones around critical habitat areas ▪ If workers encounter wildlife, especially protected species, stop work immediately. ▪ Depending on the species and situation, contact the relevant wildlife agency (e.g., forestry department) for guidance or assistance. Do not allow workers to handle wildlife themselves. ▪ For some species, relocation by trained personnel might be necessary. ▪ Utilize insulated conductors in high-risk areas for avian collisions, particularly near nesting or roosting sites. Insulated conductors reduce the risk of	In and around of proposed substation's location and River crossing tower locations	Throughout the construction period.	Contractor	DSC/ BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
		electrocution if a bird contacts both phases simultaneously. ▪ Maintain adequate spacing between conductors to prevent birds from bridging the gap and causing a short circuit.				
B.6	**Dust & air pollutions.** ▪ Emissions from construction related vehicles and machinery. ▪ Dust suspension due to frequent vehicle/trucks movement in roads & construction works. ▪ Health hazard to laborers and residents/ workers due to dust spreading.	▪ Ensure all construction machinery and vehicles are maintained in good working order and have passed emissions test for noise and air emissions as applicable to them. ▪ Improve the conditions of unpaved access roads to substations before the commencement of any excavation or other earthworks at the substations. ▪ During the dry season or in windy conditions, undertake water sprinkling at least twice a day in exposed areas prone to dust generation where sensitive receptors are located (houses, schools, clinics, temples, etc.) and at substations sites. ▪ Minimize the removal of existing vegetation and topsoil. ▪ Prohibit burning of waste generated by project related activities. ▪ Prohibit burning of construction-related waste in open spaces	At all work sites, in the impact corridor	Throughout the construction period.	Contractor	DSC/ BREB
B.7	**Noise pollution** ▪ During construction on the land, noise levels produced by vehicles, machinery, concrete mixing, and other construction activities will exceed the applicable standards and may cause nuisance to local community. ▪ Hearing hazards to labors and residents.	▪ Introduce noise plugs for workers during the operation of heavy construction equipment. ▪ Do not allow any construction work during nighttime (9 PM to 6 AM) ▪ The layout of the substations will need to be designed to keep construction works and transformers as far away from the houses as possible, to ensure that noise generated from construction activities and during substation	Construction site, construction camp.	Throughout the construction period.	Contractor	DSC/ BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
		operation does not exceed these noise levels. ▪ Avoid using of construction equipment producing excessive noise at night. ▪ Construction activities should not be during nighttime. ▪ Avoid prolonged exposure to noise (produced by equipment) by workers; and ▪ Regulate use of horns and avoid use of hydraulic horns in project vehicles. ▪ Generator should be placed within room (concrete walls with roof). ▪ Monitoring of noise level at construction site, construction camp as and when required.				
B.8	**Occupational health and safety** ▪ Health & safety risks of construction workers during the construction period	▪ (During the COVID-19 pandemic), conduct temperature checks at the entry points to the worksite at the start of shift, and record all suspected and confirmed cases. ▪ Ensure that workers comply with the EHS Guidelines on construction and demolition. ▪ Ensure that workers are already qualified or else they are trained to operate on electrical equipment and working at heights. ▪ Take disciplinary action against workers who do not comply with the use of PPE ▪ Utilize properly anchored and maintained fall arrest systems (harnesses, lanyards, shock absorbers) for all workers deployed for the construction of towers and cables over the river crossings ▪ Implement double tie-off procedures to ensure redundancy and safety.	All construction site, labour camps	Regularly	Contractor	DoE/BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
		▪ Use fixed ladders or walkways with guardrails for safe access and egress. ▪ Utilize temporary safety nets below work areas to catch potential falls. ▪ To prevent Electrocution, De-energize the lines or isolate work areas from live conductors whenever possible. ▪ Ground all tools and equipment used near live lines. ▪ Maintain safe working distances from energized conductors based on voltage and weather conditions. ▪ Wear electrically insulated gloves, boots, and coveralls for added protection. ▪ Provide workers with snake boots and long pants as PPE during construction activities in high-risk areas.				
B.9	**Release of toxic pollutants, chemicals and gases to receptors (air, water, land) from transformers and other project equipment** ▪ Transformers are one of the most common forms of industrial hazardous waste, containing metals toxic to human health and the environment. ▪ Other equipment also releases chemicals and gases that are harmful to environment and Human health.	▪ Provide training on handling of PCB hazards related to old transformers and as per the requirements of national laws and regulations for its phase out and environmentally sound disposal. ▪ Label the equipment purchased by BREB or Contractor as PCB & SF6 free. ▪ The oil must be sampled and analyzed following UNEP Guidelines for the identification of PCB and materials Containing PCB18 and in the absence of test data all transformers must be assumed by the Contractor to contain PCBs and a health and safety risk assessment and plan referring to the measures in UNEP (2002) PCB transformers and capacitors: From management to reclassification and disposal. ▪ Chemical and/or oil resistant gloves, goggles, and protective clothing need to	Existing substations which will be augmented/ Fault locator/ Transformer	Inspection and testing at Monthly	Contractor	DSC/ BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
		be available for workers to wear whilst sampling transformers. ▪ Required proper transport, storage, decontamination, and disposal of contaminated units to be assured by BREB; disposal should involve facilities capable of safely transporting and disposing of hazardous waste containing PCBs and SF_6. ▪ Obtain approval from relevant authorities for the handling, transport, storage and disposal of old transformers by third party vendors ▪ Surrounding soil exposed to oil leakage from equipment should be assessed by Contractor, and proper removal remediation measures should be implemented in accordance with the General EHS Guidelines. ▪ Transformers should be located on concrete pad platforms with oil liners for any potential leakage. ▪ A protocol in handling hazardous waste like lead acid batteries (if any), lubricants, etc. in their operations should be developed by BREB.				
B.10	**Water Resources** ▪ During construction, greywater generates from the base camp location and may contaminate local water body and soil if mixed into irrigation canal and local waterbodies. Spillage of any kind of oil or lubricant during construction activity may hamper soil quality.	▪ Provide adequate on-site sanitation facilities including septic tanks and soak-away pits or alternative sanitary facilities that do not allow the untreated disposal of sewage to adjacent water bodies e.g., portable toilets (the same requirement applies to any construction camps). ▪ Provide an appropriate construction waste collection and disposal system. ▪ Provide designated hard standing areas for equipment servicing, refuelling, and wash down at least 50m away from	Construction site, labour camp, Adjacent Pond to the substation.	Throughout the construction period	Contractor	DSC/ BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
		watercourses, springs, and wells, with drainage directed through oil and grease interceptors before being discharged into a settling pond before discharging offsite. ▪ Enforce good operation and maintenance practices for construction equipment. ▪ Store oil, fuels, and chemicals and mounting of the plant containing oil and diesel on drip trays to catch leaks. ▪ Place oil spill clean-up materials (sorbent pads, loose sorbent material, etc.) at the site. ▪ In case of construction of ground water abstraction units (tube wells) at Project site, obtain the prior to installation of any tubewell.				
B.11	**Fisheries** ▪ Loss of floodplain areas and burrow pits/ponds with consequent loss of aquatic fauna and flora	▪ Do not throw any garbage, toxic or otherwise, into neighbouring water bodies or the river. ▪ Any portion of a water body holding fish that has been temporarily isolated for the existence of fish must be inspected for the presence of fish, and all fish must be caught and returned uninjured in nearby fish habitat.	Adjacent fishpond near to the construction site and labour camps	Throughout the construction period	Contractor	DSC/ BREB
B.12	**Burrow pit** ▪ Borrowing pits can disrupt natural habitats and displace wildlife, especially if located in ecologically sensitive areas. ▪ Improper excavation and management of borrow pits can lead to soil erosion, sedimentation of waterways, and loss of fertile topsoil. ▪ Borrow pit activities can pollute nearby water sources through dust, runoff containing pollutants, or accidental spills.	If any borrow pit is required, then PBSs will find suitable locations avoiding any disruption. For Identification and selection of sites for disposal and borrow pit some criteria and mitigative measures should be considered as follows: ▪ Locations will not in ecological sensitive area (e.g. Protected Area or Key Biodiversity Area)	Proposed Burrow pit location	When required during construction period	Contractor	DSC/ BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
		▪ Locations will not in wetlands or riparian zones, i.e. at least 500 meters from river, lake etc. ▪ Above the 0.05 (5%) Annual Exceedance Probability flood line. ▪ Not on slope-land of more than 10%, to avoid erosion or landslid. ▪ Not in land with agricultural, spiritual, cultural, historical value, etc. ▪ Not where groundwater emerges, or a thick organic layer is present. Where possible existing borrow pits or spoil disposal sites shall be used. If new sites are needed, the contractor shall obtain approval from the relevant authorities and from PMU/PMC to ensure that sensitive habitats are avoided, and that appropriate mitigation and rehabilitation measures will be implemented. ▪ Obtain and document agreement with the landowner. ▪ Ensure minimization of vegetation and habitat loss and limit land clearance to only the land required for the borrow pit / spoil disposal.				
B.13	**Community health and safety (H&S)** ▪ Community health and safety such as the toppling of concrete poles, traffic and accidents, the emergency spill of materials, and access of villagers to dangerous working areas.	▪ Prevent stagnation of residual water to avoid breeding for mosquitoes and other insects. ▪ Display the site and office contacts in the event of a grievance during construction. ▪ Install on all substation fences/equipment and poles visual and written warning signages to the public to include the ISO 7010 Hazard Type: Electrical Symbol warning of the risk of electrocution. ▪ Provision for ensuring the cable's security to prevent vandalism.	All construction site, labour camps	Regularly	Contractor	DoE/ BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
		▪ Lighting arrestors should be installed along all lines. ▪ Do not leave hazardous conditions (e.g., unlit open excavations without means of escape) overnight unless no access by the public can be ensured. ▪ Prevent standing water as it may become a breeding habitat for mosquitoes etc. ▪ During construction works provide signage detailing site and office contacts in case of grievance.				
B.14	**Fire safety.** ▪ Risk of fire hazard	▪ Provide appropriate types of firefighting equipment suitable for the construction camps. ▪ Display emergency contact numbers clearly and prominently at strategic places in camps. ▪ Firefighting equipment will be made available as required at construction sites, camp sites, and particularly near the fuel storage. ▪ Workers should be trained in emergency preparedness and response procedures and a manual on safety and emergency procedures during operation should be prepared and disseminated to workers on, e.g. extinguishing oil fires from transformers. ▪ Undertake overall responsibility for fire safety implementation, including appointing a fire safety officer, and ensure adequate resources, and regular training and drills. ▪ Ensure that workers understand fire safety procedures, know emergency escape routes, operate fire extinguishers, and participate in	Existing and proposed substations site, Labour camp and construction operation area	Monthly	Contractor	DSC/ BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
		training and drills. ▪ Install and maintain a fire alarm system in all buildings, with clear procedures for activating and responding to alarms. ▪ Install a sprinkler system in high-risk areas such as storage rooms and electrical panels and ensure that they are regularly inspected and maintained.				
B.15	**Risks of damages to sub-surface utilities and chance find of physical cultural resources during construction.** ▪ Damage or loss of sub-surface utilities. ▪ Damage to cultural heritages in the project area.	▪ Consult the relevant local authorities (electric, water, telecoms) on whether there are known pipes, cables, or other utility lines to identify any unknown underground utilities prior to excavation. ▪ Rehabilitate the damaged utilities to their original condition in conjunction with relevant local authorities at the cost tof the contractor. ▪	In and around of proposed substation's location and River crossing tower locations	Throughout the construction period.	Contractor	DSC/ BREB
B.16	**Labour Management** ▪ Risk of Social conflict between labors and community people ▪ Increased risk of illicit behavior and crime ▪ Due to migrant labour local inflation of price and increased pressure on accommodation and rent	▪ Reduce labor influx into the project area by sourcing all unskilled labor from within and around the sub-project area. If skilled labor is not available locally, it will be imported from outside the sub-project region. ▪ Prepare a Workers' Camp Management Plan by the BREB or Contractor that addresses specific aspects of the setup and operation of workers' camps, such as differentiating labor camps from material storage locations. ▪ Encourage use of flameproof material for the construction of labor housing / site office. Also, ensure that these houses/rooms are of sound construction and capable of withstanding windstorms/cyclones.	All construction sites & Labour camp	Throughout the construction period	Contractor	DSC/ BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
		▪ Construction camps will be located at least 500 m away from the communities. Entry of the site personnel in the local communities will be minimized to the extent possible/appropriate. ▪ Establish a Workers' GRM to report and resolve grievances related to health and safety aspects of the workers.				
B.17	**Gender-Based Violence and Harassment (GBVH)** ▪ Women and girls may be subjected to verbal harassment, intimidation, and threats of violence ▪ Women may be denied access to jobs, land, or other resources in exchange for sexual favors. ▪ Women may be excluded from decision-making processes or denied access to project benefits.	▪ Develop and implement a GBVH prevention and response policy. ▪ All project personnel, including workers, supervisors, and community members, should be trained on GBVH awareness, prevention, and response. ▪ Ensure gender balance in the workforce: Make efforts to recruit and hire women for construction and project-related jobs. ▪ Provide accessible and confidential channels for women to report incidents of GBVH and ensure that complaints are investigated and addressed promptly and fairly. ▪ Work with local organizations and community leaders to raise awareness about GBVH and develop culturally appropriate prevention strategies.	All construction sites & Labour camp	Throughout the construction period	Contractor	DSC/ BREB
B.18	**Impact on Indigenous Community** ▪ Land acquisition for construction could lead to the loss of traditional hunting grounds, agricultural land, or access to natural resources that the communities depend on for subsistence and income. ▪ Construction activities can disrupt daily life with noise, dust, and increased traffic congestion. This can affect sleep patterns, social gatherings, and traditional activities.	▪ Provide capacity-building programs for the indigenous communities to help them participate effectively in project decision-making and benefit from potential opportunities. ▪ Conduct a cultural heritage assessment to identify and protect any sacred sites or areas of cultural significance that might be affected by the project. ▪ Implement long-term monitoring program as identified in the IPP to assess the social impacts of the project on the indigenous communities.	At identified IP communities' area	Throughout the construction period	Contractor	DSC/ BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
		▪ Careful project siting that minimizes land acquisition from indigenous communities and respects cultural sensitivities can significantly reduce negative impacts. ▪ Open communication, obtaining Free, Prior, and Informed Consent (FPIC), and involving the communities in decision-making can help mitigate disruption and build trust. ▪ Implementing measures like dust control, noise reduction, and scheduling construction activities outside peak hours can minimize disturbance to the communities				
B.19	**Chance Find Procedures (PCRs)** ▪ According to survey within the project area no sensitive receptor or archeological site have been identified. If any person discovers a physical cultural resource, such as (but not limited to) archaeological sites, historical sites, remains and objects, or a cemetery and/or individual graves during excavation or construction phase.	▪ In case PCR is encountered during excavation, construction activities including traffic within the project area will be stopped immediately by the contractor. ▪ The discovery will be reported by the site engineer or representative from the contractor to PIU, BREB environment staff (or Consultant. ▪ The Contractor can continue with excavation and construction works within the affected area after the DOA staff has given clearance.	All constructions site and camps	When identified action need to take immediately	Contractor	BREB/DOA
C	**Operation Phase**					
C.1	**Short Circuit/Accident** ▪ Due to the short circuit of the substation, disruption of power and accident will occur.	▪ For adequate power generation, O&M of the substations should be completed in a timely manner.	All completed substations	At all times	PBS	DoE/BREB
C.2	**Power Supply** ▪ Due to adequate reliability of power supply, social life and economic condition of the people will be improved	▪ For adequate power generation, O&M of the substations should be completed in a timely manner.	All the substation site	At all times	PBS	DoE/BREB
C.3	**Waste Management**	▪ A Waste Management plan need to develop for responding to an emergency	All new completed &	At all times	PBS	DoE/BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
	▪ Preservatives used to treat wooden poles, can leach into the soil and groundwater over time. These chemicals can be harmful to plants, animals, and even human health if exposure levels are high. ▪ Poor drainage system led to contaminate water body and soil by run-off and oil spills	for hazardous materials and oil spills will be developed. ▪ A suitable drainage system with sedimentation ponds and oil separators will be provided to prevent contamination by run-off and oil spills	augmented substations			
C.4	**Community health and safety** ▪ Community H&S nearby the substation site	▪ If possible, generators should be installed in a room that is closed. ▪ Introduce safety barriers and warning signs around the substation sites	All the substation site	At all times	PBS	DoE/BREB
C.5	**Safety & Security of workers** ▪ Risk to the continuous power supply and even damage of substation	▪ In collaboration with law enforcement authorities, ensure security of the substation. ▪ A complaint book should be kept in the substation for documenting people's grievances. ▪ For substation operations, ensure the availability of sufficient safety equipment. ▪ Restricting working at height only by workers who are trained and certified to do so. ▪ Provide personal protective equipment (PPE) for employees, safety instructions, personal safety devices such as harnesses, tool bags, ropes, etc., and other safeguards	All the substation site/ River crossing tower	At all times	PBS	DoE/BREB
C.6	**Socio-economic Impact** ▪ Once there is a reliable power supply, the area will benefit from a better economic development. As a result, there will be more employment opportunities as people plan to establish small-scale industries in the area.	▪ Reduce electricity theft and distribution losses and ensure financial savings for utilities and consumers. ▪ (BREB and PBS supporting community-based electrification projects and microgrids) shall empower the local communities by providing access to electricity for essential services (e.g., healthcare, education), and stimulating small-scale entrepreneurship.	All the PBSs	At all times	PBS	BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
		▪ Ensure a swift response to restore power after disruptions				
C.7	**Impact on the local community** ▪ Disturbance to local community due to maintenance works	▪ During maintenance, works provide signage detailing site and office contacts in case of grievance. ▪ To safeguard the health and safety of maintenance employees and road users, implement traffic management measures during maintenance work using warning signs or flag personnel. ▪ Provide at least one-month advance notice to the local community through the village heads about the schedule of, location plan, and details of planned maintenance work. ▪ Carry out maintenance works only during daytime hours and on weekdays unless otherwise agreed with the village heads.	All the PBSs	At all times	PBS	DoE/BREB
C.8	**Fire Safety** ▪ Risk of fire hazard	▪ Make available firefighting equipment at the worker camps. ▪ Adopt safety precautions to transport, handle and store hazardous substances, such as fuel. ▪ Make available first aid kits will be available. ▪ Ensure the space and smooth operations for fire brigade and rescue vehicles during a fire broke out, earthquake, building slide or other disaster.	All the substations site	At all times	PBS	DoE/ BREB

Table IX-2 :Environmental and Social Management Plan for the line contract

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
A	**Pre-construction Phase**					
A.1	**DL route selection** ▪ Prior to the construction stage it is mandatory to select and finalize the route	▪ In prior to detailed design, DED consultant needs to work with E&S consultant on these	Throughout the DL route	Throughout the pre-construction	BREB	DSC/ BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
	as the misspell of route selection can resulting into vegetation damages, habitat fragmentation, land use disruption and public health concern.	environmental & social issues identified in ESIA, then the DED will be finalized. ▪ During the design phase, different route alignment will be studied for the selection or finalization of DL route. ▪ Conduct environmental surveys to identify sensitive habitats (e.g., wetlands, old-growth forests) and avoid them if possible. ▪ Consider existing corridors (roads, pipelines) for co-location to minimize new disturbances. ▪ If crossing sensitive areas is unavoidable, minimize the width of the right-of-way. ▪ Utilize appropriate pole designs and materials that blend better with the surroundings. ▪ Consider underground cabling in areas with high bird collision rates.		period		
A.2	**Interface with other utilities and traffic** Prior to construction, the BREB will obtain clearances and permits for power distribution infrastructure from agencies including the Forestry Dept., the Department of Railways & Roads & the Department of Telecommunications, as well as, if applicable, from aviation authorities.	▪ Prior to works, BREB will approve a traffic management plan for exiting road and river crossing point developed by the contractor in accordance with the project ESMP. This plan will help to minimize risks from interference with existing roads at construction sites and used for haulage during construction and after completion. ▪ Obtain necessary clearances consistent with the requirements of Government of Bangladesh from other utilities that could be affected by the project (electric, water, telecommunications etc.)	Throughout the underground DL route	Throughout the pre-construction period	BREB	DSC/ BREB
A.3	**Agricultural Resources** ▪ Construction activity may have an impact on agricultural land and crop production, though most of it will be for temporary period only ▪ Project vehicle movements in dusty areas may infect tree leaves by depositing dust and smoke and affect the photosynthesis rate until sprayed with water properly.	▪ Crop compensation will be provided if any crops will be affected due to pole construction & material movement for DL construction. ▪ The landowner also gets the proper value for that land. ▪ A compensation program for the creation of jobs for victim families, initiatives to reduce the negative impact on agricultural lands, and increased crop production from limited land will keep the loss at an agreeable limit.	Throughout the DL route	Throughout the pre-construction period	BREB	DSC/ BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
A.4	**Cutting or trimming of trees and vegetation** ▪ One of the regular programs to maintain the integrity of the distribution lines is the trimming of tall trees and vegetation along the ROW. **Loss of trees** ▪ Loss of standing crops (if any), grass and bushes of construction camp sites	▪ Ensure that felling or trimming of any trees are undertaken only when it is essential such as for safety clearance requirements. ▪ Obtain prior approval from the Forest Department for felling/trimming trees around the protected or forest areas reserves ▪ Provide compensation for any loss of fruit-bearing trees that have economic value. ▪ Schedule the times for tree felling/trimming to avoid the breeding seasons of the birds. ▪ Ensure that any tree replanting programs are conducted without any disturbances to the project activities. ▪ Select the plant species varieties that would restore the lost territorial flora and fauna habitats. ▪ Provide adequate compensation to the owners in a timely manner prior to the commencement of clearing the vegetation.	Throughout the DL route	Throughout the pre-construction period	Contractor	DSC/ BREB
A.5	**Socio-economic conditions** ▪ Employment opportunities for the local people especially for PAPs.	▪ Employ local people, especially PAPs, for the project activities as much as possible. ▪ Prior to the actual start of construction, all public utilities (e.g., water pipes, gas pipes, power/telephone lines) that may be affected by the proposed highway will be relocated; and ▪ Utility infrastructure relocation will be considered in the design and budgeting process.	Throughout the DL route	Throughout the pre-construction period	Contractor	DSC/ BREB
A.6	**Flora and Fauna** Disturbance of wildlife specially birds due to project activities such as earthworks, moving of project equipment and transports.	▪ In prior to construction, Biodiversity Screening Framework and detail biodiversity screening assessment should be carried out after finalization of all DL route and detail design to identify potential impacts on biodiversity early in the planning stage. ▪ Providing training to the worker for maintaining the Code of Conduct for the workers.	Throughout the DL route	Throughout the pre-construction period.	BREB	DSC/ BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
A.7	**Encroachment into ecologically sensitive areas** ▪ The proposed project site is located in a plot area earmarked for Industrial development. There is no encroachment of sensitive habitats like protected forest areas or terrestrial wildlife sanctuary habitats.	▪ For tree cutting/trimming outside protected or forest areas obtain approvals from forest department as per national regulatory framework, approvals are required. ▪ Within the designated protected area, IBA, reserve forest area, or sacred grove etc. No work shall be undertaken, and no temporary or permanent project facilities established. ▪ New lines will be designed, and existing lines will be retrofitted, to be ecologically sensitive for birds in accordance with international best practice, such as maintaining 1.5 meter spacing between energized components and grounded hardware or, where spacing is not possible, covering energized parts and retrofitting elevated perches, insulating jumper loops, placing obstructive perch deterrents, changing the location of conductors, and/or using raptor hood.	Throughout the DL route	Throughout the pre-construction period	Contractor	DSC/ BREB
A.8	**Occupational Health & Safety** ▪ The construction of 33 and 11 kV distribution lines poses some risk to the health and safety of workers.	▪ Contractor will be required to prepare and implement an occupational health and safety risk assessment and plan (including COVID-19 risks) for approval before construction works. ▪ The risk assessment should be undertaken through a facilitated risk assessment workshop involving the contractor, BREB, and project implementation agency. ▪ Before construction activities initiated, Garbage containers will be provided for the disposal of garbage created by workers, as rubbish burning will be forbidden. .	Throughout the DL route	Throughout the pre-construction period	Contractor	DSC/ BREB
B	**Construction Phase**					
B.1	**Land and agricultural resources** ▪ Unanticipated impacts on the property including land and structures	▪ Defining the work zone and preventing incursions outside the agreed-upon impact corridor. ▪ Fertile land with two or more crops growing now, or land with such potential, might be	Throughout the DL route	Throughout the pre-construction period	Contractor	DoE/ BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
	▪ Loss of agricultural land causes a temporary disruption of farming activities, damage to crops, bunds, canals and drains.	avoided. In the case that non-agriculture khash land becomes available, it should be prioritized. ▪ The most productive and suited for agriculture production soils on nearby property might be retained. ▪ Shallow and deep tube wells could be used for irrigation to cultivate Boro rice and Rabi crops. Winter cropping area may be increased by installing deep tube wells. ▪ Assure that construction activities are as clean as they possibly can be. ▪ There might have a provision of cattle passes at a regular interval, each width should be enough for cattle movement and agricultural machinery movement.				
B.2	**Interference with traffic and accessways** ▪ Stockpiling of poles, spoil and cable reels can cause the block	▪ Safe access to property and roads should be maintained and alternative routes and access provided where there are temporary diversions or blockages.	Construction areas and Route of material movements	Throughout the construction period.	Contractor	DoE/ BREB
B.3	**Soil erosion** ▪ Soil erosion during auguring/ excavation of pole foundation.	▪ Minimize removal of existing vegetation and topsoil to that which is necessary. ▪ To restore the surface of excavated areas, topsoil disturbed during site construction will be utilised. ▪ Excavation for poles will be limited to within the agreed corridor of impact, ideally road reserve.	Pole construction area	Construction areas and Route of material movements	Throughout the construction period.	DoE/ BREB
B.4	**Ecosystem /Cutting or trimming of trees** ▪ One of the regular programs to maintain the integrity of the distribution lines is the trimming of tall trees and vegetation along the ROW. ▪ Loss of Trees ▪ The project alignment of the 33/11 kV distribution lines may go over some trees and vegetation which may also be affected and would need to be cut or	▪ No temporary or permanent projects shall be undertaken or established within a protected area, IBA, reserved forest area, or sacred grove etc. ▪ Demarcation of mature trees to be avoided and retained. ▪ Demarcation of the working area and avoid encroachment outside the agreed corridor of impact.	Along the DL route	Quarterly	Contractor	DSC/ BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
	trimmed in order to achieve the standard safety clearances for distribution power lines.	▪ Cutting or trimming of trees is prohibited unless in accordance with design drawings in order to meet safety clearance requirements. ▪ Unanticipated loss of fruit-bearing trees that have economic value shall be compensated at the cost of contractor in accordance with Resettlement Plan. ▪ For all public trees removed replacement by native tree species in consultation with forest department. ▪ Before cutting/trimming trees Contractor's EHS Officer to check for presence of nesting birds or roosting bats. ▪ Works requiring tree cutting/trimming outside the bird nesting/breeding season needs to be undertaken. ▪ Critical Habitat Assessment (CHA) needs to be done prior to any construction activities in areas where CR and EN species were found.				
B.5	**Biodiversity** ▪ Clearing vegetation for construction can fragment wildlife habitats, disrupting animal movement and breeding patterns. ▪ Food scraps and waste from construction camps can attract scavenger animals, potentially increasing human-wildlife conflict. ▪ Disturb birds and other wildlife due to stringing operation of power line particularly during breeding seasons	▪ Clearly demarcate construction boundaries and establish buffer zones around sensitive habitats. Minimize vegetation clearing within these zones. ▪ If construction fragments habitats, consider creating wildlife corridors (e.g., green bridges over roads) to allow safe animal movement. ▪ Implement security measures like fencing, patrolling, and controlled access to prevent unauthorized entry and poaching activities. ▪ Work with local communities to raise awareness about the importance of biodiversity and encourage their participation in conservation efforts. ▪ Avoiding stringing of power line during breeding seasons or establishing buffer zones around critical habitat areas	Throughout the DL route	Throughout the construction period.	Contractor	DSC/ BREB
B.6	**Dust & air pollutions**	▪ Ensure all construction machinery and vehicles are maintained in good working order	Throughout the DL route	Throughout the construction period	Contractor	DSC/ BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
	▪ Emissions from construction related vehicles and machinery. ▪ Dust suspension due to frequent vehicle/trucks movement in roads & construction works. ▪ Health hazard to laborers and residents/ workers due to dust spreading.	and have passed emissions test for noise and air emissions as applicable to them. ▪ Remove existing vegetation and topsoil as little as possible and as soon as possible. ▪ Burning of waste generated by project related activities to be strictly prohibited. ▪ Construction-related waste will not be allowed to be burned openly.				
B.7	**Noise pollution** ▪ During construction on the land, noise levels produced by vehicles, machinery, concrete mixing, and other construction activities will exceed the applicable standards and may cause nuisance to local community. ▪ Hearing hazards to labors and residents.	▪ Use of noise plug in heavy construction equipment. ▪ It is recommended that no construction should be allowed during nighttime (9 PM to 6 AM) ▪ Avoid using of construction equipment producing excessive noise at night; ▪ Construction activities should not be during nighttime ▪ Avoid prolonged exposure to noise (produced by equipment) by workers; and ▪ Regulate use of horns and avoid use of hydraulic horns in project vehicles. ▪ Generator should be placed within room (concrete walls with roof). ▪ Monitoring of noise level at construction site, construction camp as and when required.	Throughout the DL route and construction camp	Throughout the construction period	Contractor	DSC/ BREB
B.8	**Occupational health and safety** ▪ Health & safety risks of construction workers during the construction period	▪ During the COVID-19 pandemic, temperature checks to be carried out at the entrance of the worksite at the start of shift, and records of all suspected and confirmed cases to be kept. ▪ Require workers to observe the EHS Guideline on Construction and Demolition. ▪ Personnel must have a record of attending an appropriate course on electrical safety and working at height, and they must be adequately trained and qualified to operate on electrical equipment and at height. ▪ No compliance with PPE standards will result in disciplinary action (e.g., immediate removal from site)	Along the DL route	Regularly	Contractor	DoE/BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
		▪ To work over the river crossing tower utilize properly anchored and maintained fall arrest systems (harnesses, lanyards, shock absorbers) for all workers on the tower. ▪ Implement double tie-off procedures to ensure redundancy and safety. ▪ Use fixed ladders or walkways with guardrails for safe access and egress. ▪ Utilize temporary safety nets below work areas to catch potential falls. ▪ To prevent Electrocution, De-energize the lines or isolate work areas from live conductors whenever possible. ▪ Ground all tools and equipment used near live lines. ▪ Maintain safe working distances from energized conductors based on voltage and weather conditions. ▪ Wear electrically insulated gloves, boots, and coveralls for added protection. ▪ Provide workers with snake boots and long pants as PPE during construction activities in high-risk areas.				
B.9	**Water Resources** ▪ During construction, greywater generates from the base camp location and may contaminate local water body and soil if mixed into irrigation canal and local waterbodies. Spillage of any kind of oil or lubricant during construction activity may hamper soil quality.	▪ Provision of adequate on-site sanitation facilities including septic tanks and soak-away pits or alternative sanitary facilities that do not allow the untreated disposal of sewage to adjacent water bodies e.g., portable toilets (the same requirement applies to any construction camps). ▪ Provision of an appropriate construction waste collection and disposal system. ▪ Provision of designated hard standing areas for equipment servicing, refuelling, and wash down at least 50m from watercourses, springs, and wells, with drainage directed through oil and grease interceptors before being discharged into a settling pond before discharging offsite.	Construction site, labour camp,	Throughout the construction period	Contractor	DoE/BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
		▪ Implementation of good operation and maintenance practices for construction equipment. ▪ Storage of oil, fuels, and chemicals and mounting of the plant containing oil and diesel on drip trays to catch leaks. ▪ Oil spill clean-up materials (sorbent pads, loose sorbent material, etc.) should be stationed at the site.				
B.10	**Waste Management** ▪ Improperly disposed of wooden poles take up space in landfills and may release harmful chemicals if not treated correctly. ▪ Burning old poles for disposal can release air pollutants, contributing to respiratory problems and smog.	▪ Large size wooden poles should be separated from waste parts to make small size poles, logs, and transformer re-winding. ▪ Before disposal/demolition, the good part of the spoiled and unusable wooden poles can be used as fencing/boundary in different areas of the PBS. ▪ Treated wood products shall never be burned according to PBS instruction 100-5 ▪ For new installations, consider using poles made from more sustainable materials like concrete or composite materials with lower environmental impact at the end of their lifespan.	Warehouse/ Construction site	Throughout the construction period	Contractor/PBS	DoE/BREB
B.11	**Community health and safety (H&S)** ▪ Community health and safety such as the toppling of concrete poles, traffic and accidents, the emergency spill of materials, and access of villagers to dangerous working areas.	▪ Residual water must be avoided since it might serve as a breeding ground for mosquitoes and other insects. ▪ Provide signs detailing site and office contacts in the event of a grievance during construction. ▪ ISO 7010 Hazard Type: Electrical Symbol warning of the risk of electrocution. ▪ Provision for ensuring the cable's security to prevent vandalism. ▪ Lighting arrestors should be installed along all lines. ▪ Do not leave hazardous conditions (e.g., unlit open excavations without means of escape) overnight unless no access by the public can be ensured	All construction site, labour camps	Regularly	Contractor	DoE/ BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
		▪ Prevent standing water as it may become a breeding habitat for mosquitoes etc. ▪ During construction works provide signage detailing site and office contacts in case of grievance.				
B.12	**Fire safety** ▪ Risk of fire hazard	▪ Provide appropriate types of firefighting equipment suitable for the construction camps ▪ Display emergency contact numbers clearly and prominently at strategicplaces in camps. ▪ Firefighting equipment will be made available as required at construction sites, camp sites, and particularly near the fuel storage. ▪ Workers should be trained in emergency preparedness and response procedures and a manual on safety and emergency procedures during operation should be prepared and disseminated to workers on, e.g. extinguishing oil fires from transformers. ▪ Overall responsibility for fire safety implementation, including appointing a fire safety officer, ensuring adequate resources, and conducting regular training and drills ▪ Workers should understand fire safety procedures, know emergency escape routes, operate fire extinguishers, and participate in training and drills. ▪ Sprinkler system need to be Installed in high-risk areas such as storage rooms and electrical panels, regularly inspected and maintained.	Along the DL route	Monthly	Contractor	DSC/ BREB
B.13	**Risks of damages to sub-surface utilities and chance find of physical cultural resources during construction.**	▪ Relevant local authorities (electric, water, telecoms) are to be consulted whether there are known pipes, cables, or other utility lines to identify any unknown	ROW of the underground cable	Throughout the construction period	Contractor	DSC/ BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
	▪ Damage or loss of sub-surface utilities ▪ Damage to cultural heritages in the project area.	underground utilities prior to excavation. ▪ Damaged utilities will be rehabilitated to their original condition in conjunction with relevant local authorities at cost to the contractor. Chance finds procedures to be followed if physical cultural resources are found during construction works.				
B.14	**Labour Management** ▪ Risk of Social conflict between labors and community people ▪ Due to migrant labour local inflation of price and increased pressure on accommodation and rent	▪ Reduce labor influx into the project area by sourcing all unskilled labor from within and around the sub-project area. If skilled labour is not available locally, it will be imported from outside the sub-project region. ▪ Prepare a Workers' Camp Management Plan by the BREB or Contractor that addresses specific aspects of the setup and operation of workers' camps, such as differentiating labour camps from material storage locations. ▪ Encourage use of flameproof material for the construction of labor housing / site office. Also, ensure that these houses/rooms are of sound construction and capable of withstanding windstorms/cyclones. ▪ Construction camps will be located at least 500 m away from the communities. Entry of the site personnel in the local communities will be minimized to the extent possible/appropriate ▪ GRM for the labour will be established to address grievances related to health and safety aspects. Residual Impacts Even after implementing the above-listed mitigation measures	All construction sites & Labour camp	Throughout the construction period	Contractor	DSC/ BREB
B.15	**Gender-Based Violence and Harassment (GBVH)** ▪ Women and girls may be subjected to verbal harassment, intimidation, and threats of violence	▪ Develop and implement a GBVH prevention and response policy. ▪ All project personnel, including workers, supervisors, and community members, should be trained on GBVH awareness, prevention, and response.	All construction sites & Labour camp	Throughout the construction period	Contractor	DSC/ BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
	▪ Women may be denied access to jobs, land, or other resources in exchange for sexual favors. ▪ Women may be excluded from decision-making processes or denied access to project benefits.	▪ Ensure gender balance in the workforce: Make efforts to recruit and hire women for construction and project-related jobs. ▪ Provide accessible and confidential channels for women to report incidents of GBVH and ensure that complaints are investigated and addressed promptly and fairly. ▪ Work with local organizations and community leaders to raise awareness about GBVH and develop culturally appropriate prevention strategies.				
B.16	**Chance Find Procedures (PCRs)** ▪ According to survey within the project area no sensitive receptor or archaeological site have been identified. If any person discovers a physical cultural resource, such as (but not limited to) archaeological sites, historical sites, remains and objects, or a cemetery and/or individual graves during excavation or construction phase.	▪ The discovery will be reported by the site engineer or representative from the contractor to PIU, BREB environment staff (or Consultant. ▪ The Contractor can continue with excavation and construction works within the affected area after the DOA staff has given clearance.	All constructions site and camps	When identified action need to take immediately	Contractor	BREB/DOA
B.17	**Impact on Indigenous Community** ▪ Land acquisition for construction could lead to the loss of traditional hunting grounds, agricultural land, or access to natural resources that the communities depend on for subsistence and income. ▪ Construction activities can disrupt daily life with noise, dust, and increased traffic congestion. This can affect sleep patterns, social gatherings, and traditional activities.	▪ Provide capacity-building programs for the indigenous communities to help them participate effectively in project decision-making and benefit from potential opportunities. ▪ Conduct a cultural heritage assessment to identify and protect any sacred sites or areas of cultural significance that might be affected by the project. ▪ Implement long-term monitoring program as identified in the IPP to assess the social impacts of the project on the indigenous communities. ▪ Careful project siting that minimizes land acquisition from indigenous communities and respects cultural sensitivities can significantly reduce negative impacts.	At identified IP communities' area	Throughout the construction period	Contractor	DSC/ BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
		▪ Open communication, obtaining Free, Prior, and Informed Consent (FPIC), and involving the communities in decision-making can help mitigate disruption and build trust. ▪ Implementing measures like dust control, noise reduction, and scheduling construction activities outside peak hours can minimize disturbance to the communities				
C	**Operation Phase**					
C.1	**Short Circuit/Accident** ▪ Due to the short circuit at the distribution line, disruption of power and accident will occur.	▪ For adequate power generation, O&M of the distribution line should be completed in a timely manner.	All completed distribution line	At all times	PBS	DoE/BREB
C.2	**Power Supply** ▪ Due to adequate reliability of power supply, social life and economic condition of the people will be improved	▪ For adequate power generation, O&M of the distribution line should be completed in a timely manner.	All completed distribution line	At all times	PBS	DoE/BREB
C.3	**Community health and safety** ▪ Community H&S nearby the DL route.	▪ Install clear and informative signs in Bangla along the construction route highlighting safety risks and contact information for emergencies or complaints. ▪ Clearly mark underground utilities and conduct safety briefings for workers regarding electrical hazards. Require workers to wear appropriate Personal Protective Equipment (PPE) like gloves and boots.	All completed distribution line	At all times	PBS	DoE/BREB
C.4	**Safety & Security of workers** ▪ Risk to the continuous power supply and construction of overhead and underground distribution line.	▪ In collaboration with law enforcement authorities, ensure security of the distribution line. ▪ A complaint book should be kept in the site office and PBSs office for documenting people's grievances. ▪ Restricting working at height only by workers who are trained and certified to do so. ▪ Provision of personal protective equipment (PPE) for employees, safety instructions, personal safety devices such as harnesses, tool bags, ropes, etc., and other safeguards	All completed distribution line	At all times	PBS	DoE/BREB

SL	Environmental & Social Impacts	Mitigation Measures	Location	Timing/Duration	Implementation Agency	Supervision Agency
		are among the safety measures that are required.				
C.5	**Socio-economic Impact** ▪ Once there is a reliable power supply, the area will benefit from a better economic development. As a result, there will be more employment opportunities as people plan to establish small-scale industries in the area.	▪ Modernization efforts often include measures to reduce electricity theft and distribution losses, which can lead to financial savings for utilities and consumers. ▪ BREB and PBS Supporting community-based electrification projects and microgrids can empower local communities, provide access to electricity for essential services (e.g., healthcare, education), and stimulate small-scale entrepreneurship. ▪ PBS play a crucial role to Ensure a swift response to restore power after disruptions is essential for community safety and recovery.	All completed distribution line	At all times	PBS	BREB
C.6	**Impact on the local community** ▪ Disturbance to local community due to maintenance works	▪ During maintenance, works provide signage detailing site and office contacts in case of grievance. ▪ To safeguard the health and safety of maintenance employees and road users, implement traffic management measures during maintenance work using warning signs or flag personnel. ▪ Provide at least one-month advance notice to the local community through the village heads about the schedule of, location plan, and details of planned maintenance work. ▪ Carry out maintenance works only during daytime hours and on weekdays unless otherwise agreed with the village heads.	All completed distribution line	At all times	PBS	DoE/BREB
C.7	**Fire Safety** ▪ Risk of fire hazard	▪ Firefighting equipment will be made available at thecamps. ▪ First aid kits need to be available.	All completed distribution line	At all times	PBS	DoE/ BREB

D. ENHANCEMENT PLAN

567. During pre-construction, construction and operating phases, a comprehensive ESMP with various mitigating strategies has been suggested. Some following measures are recommended as part of the improvement plan in order to reduce any potential dangers-

- Industrial gaseous effluent, solid wastes, and wastewater must be disposed of before they are released into the environment.
- Environmental, social, health and safety standards must be maintained to promote trust and confidence among workers and employers.
- All the unpaved open spaces in the zone premises may be made greener by planting trees in order to improve the aesthetics of the sites as well as their long-term sustainability.

E. COMPENSATION PLAN

568. A standard compensation plan has to be developed for the individuals or households who are affected due to the proposed project and any injury or diseases occur during construction or operation phase. It essentially needs to provide necessary compensation as per the law of land. No Resettlement Action Plan (RAP) is required in this project because there is no displacement due to the project development. Workers who develop any disease/injury during the construction or operational phase of the proposed project should be treated accordingly with ensuring necessary compensation by the responsible authority.

F. ENVIRONMENTAL MONITORING PLAN

569. The aim of environmental monitoring during the pre-construction, construction and operation phases of the project is to compare the monitored data against the baseline condition collected during the study period (particularly during the detailed design stage) to assess the effectiveness of the mitigation measures and the protection of environmental components (e.g., air, water, soil, noise etc.) based on the national environmental standards (e.g., ECR 1997). Since the project is likely to have impact on various components of the environment, a comprehensive monitoring plan covering soil erosion, drainage congestion, tree plantation, air quality, water quality, noise, wildlife movement, workers' and community health and safety and so on need to be developed.

Objectives of the Environmental Monitoring Plan

570. The objective of environmental monitoring during the construction and operation phases is to compare the monitored data against the baseline condition collected during the study period to assess the effectiveness of the mitigation measures and the protection of the ambient environment based on national standards. The main objectives of the pre-construction, construction and operation phase monitoring plans are to:

- Make sure construction materials are properly disposed of in a secure manner.'
- Monitor the rehabilitation of borrow areas and the restoration of construction campsites as described in the ESMP.
- Appraise the adequacy of the ESIA with respect to the project's predicted long-term impacts on the corridor's physical, biological and socio-economic environment.
- In case modifications are needed, evaluate and recommend the effectiveness of the mitigating measures provided in the ESMP.

571. An Environmental Monitoring Plan (EMoP) has been prepared (Table X-2) along with this ESIA for the execution as a means to mitigate or minimize the adverse impacts associated with construction and operational activities of the project on the natural and social environments.

G. MONITORING & REPORTING

572. The BREB and respective PBS will be in charge of monitoring project processes, outputs, outcomes, and impacts on a regular basis. They will put in place the institutional arrangements needed to monitor the implementation of the ESMP. Staff will assist the safeguard officers (one social and one environmental) in providing periodic progress reports on the status of safeguards implementation.

573. The BREB, with the assistance of the respective PBS, will develop separate monitoring plans, which will include key monitoring areas, methodologies, and relevant indicators, as well as plans for disclosing monitoring results well in advance of project implementation. The monitoring strategy will consider both substations and distribution lines. The monitoring system will also emphasize the inclusion of all relevant stakeholders in the monitoring processes, as well as the use of participatory processes. Individual/group meetings with APs and other stakeholders, as well as surveys and studies, are among the methodologies that would be used. PBS will keep a database of all relevant project information, such as baseline survey/census data, and AP profile.

574. The BREB's safeguard officers will conduct regular field visits to project sites, communicate with APs, and ensure that consultations are conducted on a regular and effective basis. The monitoring process will also focus on the progress of the RP implementation, (ii) the level of compliance of project implementation with safeguards plans and measures provided in legal agreements, including payment of compensation and other resettlement assistance and mitigation of construction related impacts, (iii) disclosure of monitoring results to APs for substations and distribution lines, and other stakeholders, and (iv) the level of consultation. The monitoring and mitigation plan is mentioned in Table VIII-2.

Table IX-3:Environmental & Social Monitoring Plan for the turn-key contract

Environmental Issues/Parameters	Monitoring Parameters	Standards/ Guidelines	Means of Monitoring	Frequency	Location	Implementation Agency	Supervision Agency
Pre-construction stage							
Land purchases	▪ Negotiations for land are conducted in a transparent environment without coercion on the landowner	As per the AIIB's ESP on direct land purchases	Field inspection	During & after land purchases	Substation sites	BREB & PBSs	BREB & AIIB
Trimming of trees and vegetation	▪ Loss of standing trees, crops, grass and bushes of substation sites	DoE/FD	Inspection	Regular during tree felling and site clearing operations	Within ROW of substation & River Crossing Tower	Contractor/FD	DSC/BREB
Training	▪ Training and orientation provided by BREB to the contractor on ESMP Implementation .	Environmental Health & Safety Guideline	Obtain record of presentation	Prior to contractor mobilization	At BREB office/PBS office	BREB/PBS	DSC/PIU/BREB
Stakeholder consutations	▪ Project related information is shared with stakeholders and stakeholder feed back obtained and incorporated into project designs	As per the stakeholder engagement plan	Reports on stakeholder engagements and information disclosure	During pre-construction stage and thereafter quarterly	at project sites	Contractors & PBSs	BREB
Payments for land purchased	▪ Full settlement of all payments due to landowners for the land purchased	As per the AIIB ESP on direct purchases	Inspection & document reviews	Prior to commencement of construction work	Purchased land	Independent third party	BREB/PBS
GRM	▪ A multi-tier GRM is established	As per the proposed structure and standards provided in the ESIA & ESMP and RPF	GRM status reports	Monthly	Project sites	Contractors & PBSs	BREB
Construction Stage							
Dust Pollution	▪ Dust should be controlled by water spraying regularly specially during dry period.	DoE guidelines	Measurement	Regular	Substation sites, Construction camp and RCT locations	Contractor	DSC/BREB
Air Quality	▪ Oxides of Sulphur (SOx), Oxides of Nitrogen (NOx), Carbon Monoxide (CO), and Particulate Matter (PM10 & PM2.5).	DoE Standards	Sampling and Laboratory Analysis	Quarterly	Proposed substations land on sample basis and RCT locations	Contractor	DSC/BREB

Environmental Issues/Parameters	Monitoring Parameters	Standards/ Guidelines	Means of Monitoring	Frequency	Location	Implementation Agency	Supervision Agency
Noise Pollution	▪ Ambient noise level	dB(A)	Measurement	As & when required	At construction sites & camps	Contractor	DSC/BREB
Surface Water Quality	▪ Temperature, pH, Electric Conductivity (EC), Total Dissolved Solids (TDS), Dissolved Oxygen (DO), Biological Oxygen Demand (BOD), Chromium (Cr), Oxygen-Reduction Potential (ORP), Hardness, and Nitrite (NO2-). Furthermore, the parameters measured for groundwater were Temperature, pH, Electric Conductivity (EC), Dissolved Oxygen (DO), Salinity, Total Dissolved Solids (TDS), Calcium (Ca), Chloride (Cl-) Chromium (Cr), Hardness, Manganese (Mn), and Nitrite (NO2-).	DoE Standards	Sampling and Laboratory Analysis	Quarterly	Nearby Water bodies & RCT Location s	Contractor	DSC/BREB
Ground Water/Drinking Water Quality	▪ Extraction of excessive groundwater from the locality in the project area for construction work may decrease the level of groundwater table. ▪ pH, Color, Turbidity, Total Hardness as CaCO3, Iron (Fe), Manganese (Mn), Arsenic (As), Chloride (Cl-), Total Coliform (TC), Faecal Coliform (FC), and Total Dissolved Solids (TDS), TPH, VOC, etc.)	DoE Standards	Sampling and Laboratory Analysis	Quarterly	At the construction site & Labour camp	Contractor	DSC/BREB
Pollution due to Wastes	▪ Checking collection, storage, transportation, and disposal of hazardous waste; ▪ Waste from construction site to be collected and disposed safely to the designated sites; and	DoE guidelines	Inspection	Regular	Construction camps	Contractor	DSC/BREB

Environmental Issues/Parameters	Monitoring Parameters	Standards/ Guidelines	Means of Monitoring	Frequency	Location	Implementation Agency	Supervision Agency
	▪ Wastes from labour camp to be disposed properly at the designated sites.						
Felling of trees and clearing of vegetation	▪ Checking whether proper compensation as mentioned in RFP is received by PAPs.	DoE/FD	Inspection	Regular during tree felling and site clearing operations	Within ROW of substation	Contractor/FD	DSC/BREB
Fauna (Wildlife)	▪ Checking whether wildlife is disturbing/killing by the workers	DoE/FD	Inspection	Monthly	ROW of Route	Contractor/FD	DSC/BREB
Drainage Congestion/Flood	▪ Checking drainage congestion & top of substation site above HFL	Hydrological/ Drainage study	Inspection	Regular during earthworks	Substation site	Contractor	DSC/BREB
Traffic Congestion/ Road Accident	▪ Checking meeting point of existing road & access road	Local authority, Elected chairman, member of the Upazilla, Police station etc.	Inspection	Regular	Meeting point of existing road & access road	Contractor	DSC/BREB
Occupational health and safety	▪ Checking health, use of PPE & 1st aid facilities, drinking water quality, sanitation and accommodation	DoE/IFC guidelines	Inspection & testing of DWQ	Regular & twice	At construction sites and camps	Contractor	DSC/BREB
Community health and safety	▪ Awareness of local people and staying safely from the project activities ▪ Measures adopted to avoid/minimize adverse impacts on community including IP communities	DoE/IFC guidelines Provisions in the ESMP	Inspection and document review	Regular	At construction site and camps	Contractor & PBSs	DSC/BREB
GBV, SEA/SH	▪ Incidences reported on SEA and SH	DoE/IFC/AIIB guidelines Provisions in the ESMP	Site inspection and document review	As and when required	At construction site and camps	Contractor & PBSs	DSC/BREB
Human trafficking	▪ Deployment of child labor, forced/bonded labor and trafficked labor	DoE/IFC/AIIB guidelines Provisions in the ESMP	Site inspections	As and when required	At construction site and camps	Contractor & PBSs	DSC/BREB
Compensation for crop and income losses	▪ Compensation for affected crops and trees are paid ▪ Compensation for affected public and private structures are paid and restored to their	ARIPA 2017, Electricity Act-2018 Provisions in the ESMP	Site inspections & compensation payment records	Monthly	Within ROW of substation	Contractor/PBS	DSC/BREB

Environmental Issues/Parameters	Monitoring Parameters	Standards/ Guidelines	Means of Monitoring	Frequency	Location	Implementation Agency	Supervision Agency
	previous standard or to a higher standard,						
Grievance Redress	▪ No. Grievances reported ▪ No. grievances resolved ▪ No. grievances not resolved ▪ PAPs accessibility to GRM ▪ Efficiency and effectiveness of the GRM,	Provisions in the ESMP (proposed GRM) and SEP	Records of GRM proceedings	Monthly	Substation site, line route sites & PBS office	Contractor & PBSs	DSC/BREB
Community Stakeholder Consultation	▪ Type of information disclosed' ▪ No. stakeholder consultations conducted ▪ Type of feedback received ▪ Project's response to stakeholder feedback ▪ ▪	Stakeholder Engagement Plan	Reports on stakeholder engagement activities	Monthly	Project sites	PBSs & Contractor	DSC/BREB
Operation Stage							
Tree replantation	▪ Replanting of saplings and checking replacement of dead saplings & nursing (watering & fertilizer) of saplings for 2 years	FD	Inspection	As & when required	Access road within the substations	FD	BREB
Drainage congestion	▪ Checking drainage congestion in the substation sites during monsoon	Hydrological/Drainage study	Inspection	As & when required during monsoon	Substation sites & RCT locations	PBS	BREB
Community health and safety	▪ Community H&S nearby the substation site	DOE/IFC guidelines	Inspection	Regular	Substation sites & RCT locations	PBS	BREB
Safety & Security of Substation & workers	▪ Checking use of PPE & duty of security force	DOE/IFC guidelines	Inspection	Regular	Substation sites & RCT locations	PBS	BREB
Short circuit/ accident	▪ Safety	DOE guidelines	Inspection	Regular	Substation sites & RCT locations	PBS	BREB
Community Stakeholder Consultation	▪ Type of information disclosed' ▪ No. stakeholder consultations conducted ▪ Type of feedback received Project's responses to stakeholder feedback	Stakeholder Engagement Plan	Reports on stakeholder engagement activities	Quarterly	Project sites	PBSs & Contractor	DSC/BREB

Table IX-4:Environmental & Social Monitoring Plan for the line contract

Environmental Issues/Parameters	Monitoring Parameters	Standards/ Guidelines	Means of Monitoring	Frequency	Location	Implementation Agency	Supervision Agency
Pre-construction stage							
Trimming of trees and vegetation	▪ Loss of standing trees, crops, grass and bushes along the DL route	DoE/FD	Inspection	Regular during tree felling and site clearing operations	Within ROW of distribution lines	Contractor/FD	DSC/BREB
D/L route alignments	▪ Impacts of route alignment on places of environmental and social significance e.g. settlements, archaeological and cultural sites, forest reserves, water bodies etc.	As per the AIIB's ESS1 of ESP	Route surveys and inventorization	After final designs are completed	Sites of D/Ls	BREB & PBSs	BREB & AIIB
Training	▪ Training for ESMP Implementation It is necessary to gain a better understanding of environmental safeguards and how they are to be implemented. This briefing must be provided by BREB to the contractor.	Environmental Health & Safety Guideline	Obtain record of presentation	Prior to contractor mobilization	At BREB office/PBS office	BREB/PBS	DSC/PIU/BREB
Stakeholder consultations	▪ Project related information is shared with stakeholders and stakeholder feedback obtained and incorporated into project designs	As per the stakeholder engagement plan	Reports on stakeholder engagements and information disclosure	During pre-construction stage and thereafter quarterly	at project sites	Contractors & PBSs	BREB
A multi-tier GRM is established	▪ As per the proposed structure and standards provided in the ESIA & ESMP and RPF	GRM status reports	Monthly	Project sites	Contractors & PBSs	BREB	
Construction Stage							
Dust Pollution	▪ Dust should be controlled by water spraying regularly specially during dry period.	DoE guidelines	Measurement	Regular	ROW of the DL route	Contractor	DSC/BREB
Noise Pollution	▪ Ambient noise level	dB(A)	Measurement	As & when required	At construction sites & camps	Contractor	DSC/BREB

Environmental Issues/Parameters	Monitoring Parameters	Standards/ Guidelines	Means of Monitoring	Frequency	Location	Implementation Agency	Supervision Agency
Ground Water/Drinking Water Quality	▪ Extraction of excessive groundwater from the locality in the project area for construction work may decrease the level of groundwater table. ▪ pH, Color, Turbidity, Total Hardness as CaCO3, Iron (Fe), Manganese (Mn), Arsenic (As), Chloride (Cl-), Total Coliform (TC), Faecal Coliform (FC), and Total Dissolved Solids (TDS), TPH, VOC, etc.)	DoE Standards	Sampling and Laboratory Analysis	Quarterly	At the construction camps & labour camps	Contractor	DSC/BREB
Pollution due to Wastes	▪ Checking collection, storage, transportation, and disposal of hazardous waste; ▪ Waste from construction site to be collected and disposed safely to the designated sites; and ▪ Wastes from labour camp to be disposed properly at the designated sites.	DoE guidelines	Inspection	Regular	Construction camps	Contractor	DSC/BREB
Felling of trees and clearing of vegetation	▪ Checking whether proper compensation as mentioned in RFP is received by PAPs.	D0E/FD	Inspection	Regular during tree felling and site clearing operations	Within ROW of distribution lines	Contractor/FD	DSC/BREB
Fauna (Wildlife)	▪ Checking whether wildlife is disturbing/killing by the workers	DoE/FD	Inspection	Weekly	ROW of the distribution Route	Contractor/FD	DSC/BREB
Traffic Congestion/ Road Accident	▪ Checking meeting point of existing road & access road	Local authority, Elected chairman, member of the Upazilla, Police station etc.	Inspection	Regular	Meeting point of existing road & access road	Contractor	DSC/BREB
Occupational health and safety	▪ Checking health, use of PPE & 1st aid facilities, drinking water quality, sanitation and accommodation	DoE/IFC guidelines	Inspection & testing of DWQ	Regular & twice	At construction sites and camps	Contractor	DSC/BREB

Environmental Issues/Parameters	Monitoring Parameters	Standards/ Guidelines	Means of Monitoring	Frequency	Location	Implementation Agency	Supervision Agency
Community health and safety	▪ Awareness of local people and staying safely from the project activities	DoE/IFC guidelines	Inspection	Regular	At construction site and camps	Contractor	DSC/BREB
SEA/SH and security personnel	▪ Social monitoring	DoE/IFC/AIIB guidelines	Inspection	As and when required	At construction site and camps	Contractor	DSC/BREB
Human trafficking	▪ Social monitoring	DoE/IFC/AIIB guidelines	Inspection	As and when required	At construction site and camps	Contractor	DSC/BREB
Compensation for crop and income losses	▪ Monthly Monitoring	ARIPA 2017, Electricity Act-2018	Inspection	Monthly	Within ROW of distribution lines	Contractor/PBS	DSC/BREB
Grievance Redress	▪ Register Logbook,	ARIPA 2017, AIIB ESF 2022	Inspection	Daily	Construction camp, PBS office	Contractor	DSC/BREB
Community Stakeholder Consultation	▪ Awareness & Participation ▪ Focus Group Discussion	DoE/IFC/AIIB ESF 2023	Obtain record of presentation	Monthly	Project boundary	Contractor	DSC/BREB
Operation Stage							
Tree replantation	▪ Replanting of saplings and checking replacement of dead saplings & nursing (watering & fertilizer) of saplings for 2 years	FD	Inspection	As & when required	Access road within the DL	FD	BREB
Community health and safety	▪ Community H&S nearby the distribution line route	DOE/IFC guidelines	Inspection	Regular	DL route	PBS	BREB
Safety & Security of distribution line & workers	▪ Checking use of PPE & duty of security force	DOE/IFC guidelines	Inspection	Regular	DL route	PBS	BREB
Short circuit/ accident	▪ Safety	DOE guidelines	Inspection	Regular	Along the distribution Lines	PBS	BREB
Power Supply	▪ Access to electricity in the rural area on priority basis.	DOE/PDB guidelines	Inspection	During Construction and Operation	Along the distribution Lines	PBS	BREB and DoE

Environmental Issues/Parameters	Monitoring Parameters	Standards/ Guidelines	Means of Monitoring	Frequency	Location	Implementation Agency	Supervision Agency
Community Stakeholder Consultation	▪ Awareness & Participation ▪ Focus Group Discussion	DoE/IFC/AIIB ESF 2023	Obtain record of presentation	As & when required Monthly	Project boundary	PBS	DSC/BREB

H. BUDGET FOR THE ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

575. The monitoring costs for the project are to be included in the annual budgets of BREB and the PBS. The breakdown of the budget for the ESMP is given in Table IX-3. Funding will be made available for external monitoring of the Project. Also, to assist in building the capacity of the Environment and Social Management Unit at BREB and for PBS staff. ESMP budget delineates that the total budget for pre-construction phase & construction phase is BDT. 3,27,29,600 and this budget will derive from the project capital cost. In addition, the recurrent cost will be considered for the operation phase. For the operation period the budget is prepared on a yearly basis.

Table IX-5: Budget for the Environmental & Social Management Plan

A. Consultancy Cost (Expert Remuneration)					
Sl. No.	**Position**	**Person Man Month Remuneration**		**Time Input in Person/Month**	**Amount (BDT)**
a.	Senior Environmental Specialist	250000		36	9000000
b.	Senior Social Development Specialist	200000		24	4800000
Sub-Total (a+b)				60	**13800000**
B. Pre-Construction Period					
1.	Landscape/Topography	Included in engineering cost			-
2.	Land Acquisition and Resettlement	Included in engineering cost			-
3.	Damage to Public Utilities	Included in engineering cost			-
4.	Drainage Congestion	Included in engineering cost			-
5.	Technical Capacity to undertake all environmental work (Workshop)	Lump-sum			100000
C. Construction Period					
Sl. No.	**Environmental Components**	**Unit**	**Quantity**	**Rate (BDT)**	**Amount (BDT)**
1.	Tree Plantation	No.	6632	300	1989600
2.	Noise Level	No.	120	8000	960000
3.	Air Quality	No.	120	40000	4800000
4.	Surface Water Quality	No.	100	32000	3200000
5.	Ground Water/Drinking Water Quality	No.	100	30800	3080000
6.	Soil Quality	No.	100	36000	3600000
7.	Occupational Health and Safety			Lump-sum	200000
Total Construction Cost:					**17829600**
D. Environmental Clearance Certificate (ECC) and it's Renewal fee (Reimbursable)					
Sl. No.	**Tasks**	**Unit**	**Quantity**		**Amount (BDT)**
a	Renewal of Environmental Clearance Certificate (ECC) for 5 Years	Lump-sum (Government Fees)			1000000
Grand Total(A+B+C+D)					**32729600**

I. INSTITUTIONAL ARRANGEMENT FOR IMPLEMENTING THE ESMP

1. General

576. The Ministry of Power, Energy and Mineral Resources (MoPEMR) will take overall responsibility for ensuring the project implementation on behalf of the Government of Bangladesh. Bangladesh Rural Electrification Board (BREB) is executing an agency for the additional financing. The Project Implementation Units (PIUs) within the executing agency headed by a project director will implement the project.

2. Institutional Arrangements of BREB

577. BREB already has experience working on international donor-funded projects where substation construction and augmentation, as well as rehabilitation of lines, have been supported. To institutionalize the environment and social safeguards, BREB has already set up a formal Environment and Social Management Unit/Cell with qualified staff under the PIU.

578. The monitoring and supervision of the construction work at the field level will be entrusted to the respective PBSs. The General Manager and the Consultant Engineer of the PBSs will also be responsible for the implementation of the EMP, resolution of project-related grievances at field level, and payment of compensation for any losses caused by the project.

3. Department of Environment (DoE)

579. The designated institution for overseeing environmental management in Bangladesh is the Department of Environment (DoE). The DoE is responsible for ensuring that EA/EIA is carried out following the requirements of the Environment Conservation Act (1995) and Rules (1997). However, with some limitations, the DoE is a relatively new institution and has been inadequately resourced in the past. It has an institutional presence down to the district level (almost all the districts) and the divisional head office (six offices in Bogra, Sylhet, Chittagong, Rajshahi, Khulna, Rangpur) plus a combined headquarters in Dhaka. It thus falls to each of the government line agencies to ensure that their work abides by the environmental laws, rules and procedures, with the overall direction given by the DoE.

4. Forest Department (FD)

580. The Forest Department (FD) sometimes requires authorization for the cutting of trees, especially if they are in specially planted areas under their jurisdiction. Obtain the correct clearance documentation can be time-consuming, although with the proposed project tree planting programs there will be far more trees cover as a result of the project. It is thus vital to ensure that adequate time is made available to obtain the required clearance. As for the FD, it is vital to ensure that adequate time is made available in the program for obtaining any such clearance that may be required.

5. Retainer Engineer (RE)

581. The proposed framework for implementation of the project shall utilize consultancy services from Retainer Engineer (RE) for the overall design, management, and supervision of construction works of the subprojects under the project.

6. Contractor

582. The tender for the construction of the subproject would be national competitive bidding contractors. There will be a need for environmental & social awareness to rise, particularly as it relates to direct construction impacts and especially site health and safety issues. The need to develop self-regulation of the contractors will have to be emphasized, with the consultants supervising role being to check on conformity with the relevant clauses in construction contracts as well as country laws and regulations and AIIB ESS.

7. Implementation Status and Capacity Building Requirement

583. In terms of environmental & social assessment and management, the BREB has a limited amount of experience. "Environmental & social screening" and "analysis of alternatives" will be the responsibility of the BREB, and instructions have been established in ESMF for carrying out these tasks. As part of the proposed project, the BREB engineers/officials would benefit from basic training on regulatory requirements, environmental & social effects, and environmental assessment and management.

584. During the project's planning, the BREB will hire consultants to assist them with overall environmental and social management. BREB has E&S cell, and their responsibility is to support the consultant. However, the BREB has overall responsibility for environmental & social management, they must guarantee that the consultants are doing their duties correctly. It is critical that BREB engineers/officials obtain extensive training in environmental & social management and monitoring for this reason. Such training will aid them in effectively managing the actions of the consultant involved in the proposed project's environmental & social management.

585. To support their regular development work during project implementation, BREB will establish a plan for their organizational environment, social and occupational health and safety, as well as guidelines for their regular development work.

X. STAKEHOLDER ENGAGEMNET PLAN (SEP) & GRIEVANCE REDRESS MECHANISM (GRM)

A. PURPOSE/ OBJECTIVES OF STAKEHOLDER ENGAGEMENT PLAN

586. The current Stakeholder Engagement Plan's goal is to define a program for stakeholder engagement, including public information disclosure and consultation, throughout the proposed projects' construction and operation. The SEP outlines how Stakeholder Engagement will be practiced throughout the project and which methods will be used as part of the process, as well as the responsibilities of the BREB Authority and contractors in the implementation of Stakeholder Engagement activities. Indeed, while the project is not expected to result in any physical resettlement, land acquisition, and local population involvement are critical to the project's success, ensuring smooth collaboration between project staff, workers, contractors, suppliers, and local communities, as well as minimizing and mitigating environmental and social risks.

587. The overall objective of this Stakeholder Engagement Plan (SEP) is to define a program for stakeholder engagement, including public information disclosure and consultation, throughout the construction and operation of the proposed projects. The SEP outlines the ways in which BREB, and contractors will communicate with stakeholders and includes a mechanism by which people can raise concerns, provide feedback, or make any complaints about project interventions, the contractors, and the project(s) themselves. The SEP is a useful tool for managing communication between BREB and its stakeholders.
The Key Objectives of the SEP can be summarized as follows:

- Identify key stakeholders that are affected, and/or able to influence the Project and its activities.
- Identify the most effective methods, timing and structures through which to share project information, and to ensure regular, accessible, transparent and appropriate consultation.
- Develops a stakeholder's engagement process that provides stakeholders with an opportunity to engage in project planning and design and its implementation.

  Provide guidance for stakeholder engagement such that it meets the standards of national and international best practices to establish formal grievance/resolution mechanisms.

1. APPLICABILTY

588. This Stakeholder Engagement Plan is developed for the current Project design and capacity and is designed to facilitate information disclosure, consultation and participation, grievance redress mechanism including indigenous peoples located within the project area. The plan outlines the project provisions with regards to engaging with the community and also receiving feedback during the project operation.

B. REGULATION & REQUIREMENT

1. National Requirements

589. Bangladesh has relevant and adequate law/regulation on right to information, information disclosure, transparency during decision making/public hearing etc. Relevant law and regulations pertaining to these issues are given below:

a) Right to Information Act (RTIA) 2009

590. The Act makes provisions for ensuring free flow of information and people's right to information. Freedom of thought, conscience and speech is recognized in the Constitution as a fundamental right and the right to information is an alienable part of it. The right to information

shall ensure that transparency and accountability in all public, autonomous and statutory organizations and in private organizations run by government or foreign funding shall increase, corruption shall decrease, and good governance shall be established.

591. This act provides a legal framework for citizens to access information held by public authorities, promoting transparency and information disclosure.

592. Article 154 of this article mandates the establishment of local government institutions. These institutions, such as Union Parishads and City Corporations, are expected to function with some level of public participation and consultation on local matters.

2. Requirements of the AIIB

593. As a partner in the delivery of this project, the AIIB's environmental safeguard requirements were carefully considered during the preparation of this ESIA. The description of a grievance redress mechanism (GRM) is not required under the GoB environmental legislation but is mandatory for any AIIB-funded project. To that end a step-by-step process is defined in this chapter.

594. The AIIB's ESF of 2022 consolidates the following requirements on information disclosure, consultation and grievance redress mechanism:

a) *Information disclosure*

595. In accordance with ESS1, the Bank requires the Client to disclose environmental and social information. Furthermore, to improve access to environmental and social information related to Projects, the Bank discloses the Client's documentation within the timeframe specified in Section 65 of ESP.

b) *Consultation*

596. The consultation covers Project design, mitigation and monitoring measures, project-specific sharing of development benefits and opportunities, and implementation issues. During the Project's preparation and implementation, the Bank expects the Client to engage in meaningful consultation with stakeholders. In the environmental and social assessment documentation, the Bank requires the Client to include a record of the consultations as well as a list of participants.

c) *Project-level Grievance Redress Mechanism.*

597. The Bank requires the Client to establish, in accordance with the ESP and applicable ESSs, a suitable project-level GRM to receive and facilitate resolution of the concerns and complaints of people who believe they have been adversely affected by the Project's environmental or social impacts, and to inform Project-affected people of its availability.

598. AIIB requires the BREB to establish, in accordance with the ESP and applicable ESSs, a suitable Project-level GRM to receive and facilitate resolution of the concerns or complaints of people who believe they have been adversely affected by the Project's environmental or social impacts, and to inform Project-affected people of its availability. The Bank also requires the Client to establish a GRM for contracted workers under the Project to address workplace concerns and reflect this in the tender documents for these contracts.

599. Grievance redress refers to the set of actions available to anyone negatively impacted by the project and not properly dealt with, ignored or overlooked the implementation of mitigative and monitoring measures defined in the ESIA. The overriding principle of any GRM is that it must be non-threatening, easily accessible, quick and impartial, delivering decisions to the complainant in an unbiased a-political manner. GRM's have been developed for many past donor-funded projects and have been accepted by the GoB and been reasonably

successful in doing what they are supposed to do. The GRM described in this chapter builds on that success.

C. STAKEHOLDER IDENTIFICATION & ANALYSIS

600. In order to develop an effective Stakeholder Engagement Plan, it is necessary to determine who the stakeholders are and understand their needs and expectations for engagement, and their priorities and objectives in relation to the Project. People who have potential roles in a project or could be affected by the project and project activities or interested people of the project are considered as stakeholders. Stakeholders could be individuals, group of people or local communities or organizations who may be affected by the project- directly or indirectly; positively or negatively.

601. In general, engagement is directly proportional to impact and influence, and as the extent of impact of a project on a stakeholder group increases, or the extent of influence of a particular stakeholder on a project increases, engagement with that particular stakeholder group shall intensify and deepen in terms of the frequency and the intensity of the engagement method used. All engagement shall proceed on the basis of what are culturally acceptable and appropriate methods for each of the different stakeholder groups targeted.

602. Immediate positive and negative impacts for this Modernization & Capacity Enhancement Project would be faced by surrounding peoples, petty businessmen, passerby, student, teacher and guardian of nearby school, worker, and labour force. Community representatives may provide helpful insight into the local settings and act as main conduits for dissemination of the Project-related information and as a primary communication/liaison link between the Project and targeted communities and their established networks. Appropriate stakeholder representatives for this project may be included in the following key personnel's-

- BREB top management
- Elected officials of local government (UNO, AC Land)
- Community leaders or UP chairman and councilor
- Teachers and other respected persons in the local community's
- Non-elected leaders that have wide recognition within their community, such as chairpersons of local initiative groups, committees, local cooperatives etc.
- Leaders of community-based organizations, local NGOs and women's groups
- The elders and veterans within the affected community
- Religious leaders, including those representing traditional faiths
- Leaders representing local business associations
- Leaders representing working/ labour group

603. For the purposes of effective and tailored engagement, stakeholders of the proposed project(s) can be divided into the following core categories –

- **Affected Parties** – persons, groups and other entities within the Project Area of Influence (PAI) that are directly influenced (actually or potentially) by the project and/or have been identified as most susceptible to change associated with the project, and who need to be closely engaged in identifying impacts and their significance, as well as in decision-making on mitigation and management measures;
- **Other Interested Parties** – individuals/groups/entities that may not experience direct impacts from the Project but who consider or perceive their interests as being affected by the project and/or who could affect the project and the process of its implementation in some way;

1. Project-Affected Parties

604. Affected Parties include local communities, community members and other parties that may be subject to direct impacts from the project during development phase. Specifically, the following individuals and groups fall within this category –

- Affected Persons who are living nearby the project area
- The local population and local communities including the vulnerable group that include the elderly, physically and mentally disabled persons, single mothers, adolescent girls, minority transgender community and the children who are moving or leaving in the close proximity of the project area
- Residents, business entities, and individual entrepreneurs in the area of the project who are adversely affected owing to the widening of approach road, and others that can benefit from the employment, training and business opportunities offered due to implementation of the project;
- The BREB authority can take the lead in disseminating information about the proposed project to the local communities during the construction activities. Besides local NGOs, having considerable capacity, may tap for disseminating the information and raising awareness of the planned activities among the potentially affected communities in the project area.

2. Other Interested Parties

605. The projects' stakeholders also include parties other than the directly affected communities, including -

- Residents of the other rural settlements within the project area that can benefit from employment and training opportunities stemming from the project;
- Civil society groups and NGOs on the regional, national and local levels, which pursue environmental and socio-economic interests and may become partners of the project.
- Community-based groups and non-governmental organizations (NGOs) working on Gender issues including GBV and Human Rights in the locality that work for and represent local residents and other local interested groups, and act on their behalf;
- GoB officials, permitting and regulatory agencies at the national and regional levels, including environmental, technical, social protection and labor authorities.
- GoB officials at the district level and below including DoE: local Union Parishad, Upazila Parisad in the project area, village administrations; local etc.
- Business owners and providers of services, goods and materials within the project area that will be involved in the project's wider supply chain and transportation business or may be considered for the role of project suppliers in the future;
- Mass media and associated interested groups including District and local Press Club, local, regional and national print and broadcasting media, digital/web-based entities, and their associations.

3. Vulnerable Groups

606. Persons who may be disproportionately impacted or further disadvantaged by the project as compared with any other groups due to their vulnerable status[15], and that may

[15] Vulnerable status may stem from an individual's or group's race, national, ethnic or social origin, color, gender, language, religion, political or other opinion, property, age, culture, literacy, sickness, physical or mental disability, poverty or economic disadvantage, and dependence on unique natural resources.

require special engagement efforts to ensure their equal representation in the consultation and decision-making process associated with the project. Engagement with all identified stakeholders will help ensure the greatest possible contribution from the stakeholder parties toward the successful implementation of the project and will enable the project to draw on their pre-existing expertise, networks and agendas. It will also facilitate both the community's and institutional endorsement of the project by various parties. Access to the local knowledge and experience also becomes possible through the active involvement of stakeholders.

D. STRATAGY AND CONSULTATION METHODS FOR STAKEHOLDER CONSULTATION

607. There are a variety of engagement techniques that shall be used to build relationships with stakeholders, gather information from stakeholders, consult with stakeholders, and disseminate project information to stakeholders. When selecting an appropriate consultation technique, culturally appropriate consultation methods, and the purpose for engaging with a stakeholder group shall be considered. Techniques in this Project are:

Table X-1: Summary Findings of the Public Consultation

Engagement Technique	Appropriate Application of the Technique
Correspondences (Phone, Emails)	Distribute information and invite stakeholders: Local governments, News agencies, BREB headquarter, PBS Office, Project Office, Local leaders, Educational Institutions, Religious leaders and. Invite stakeholders to meetings and follow-up
One-on-one meetings	Seeking views and opinions Enable stakeholders to speak freely about sensitive issues Build personal relationships Record meetings
Formal meetings	Present the Project information to a group of stakeholders Allow group to comment – opinions and views Build impersonal relation with high level stakeholders Disseminate technical information Record discussions
Public meetings	Present Project information to a large group of stakeholders, especially communities Allow the group to provide their views and opinions Build relationship with the communities, especially those impacted Distribute non-technical information Facilitate meetings with presentations, PowerPoint, posters etc. Record discussions, comments, questions.
Focus group meetings	Present Project information to a group of stakeholders Allow stakeholders to provide their views on targeted baseline information Build relationships with communities Record responses
Public Notice	Public notice published on daily newspaper for inviting people regarding the ESIA Public consultation. Print an Electric media coverage.
Project leaflet	Brief project information to provide regular updates Site specific project information.

E. STAKEHOLDER ENGAGEMENT TO DATE

608. The survey team surveyed the project areas with support from the Project Sponsor conducted consultations with BREB officials, and village levels through formal meetings with local authorities, informal interviews and consultation with affected communities' representatives through key informant interviews (KIIs), focus group discussions (FGDs). The objectives of the stakeholder engagement activities were to:

- Update about Project progress;
- Obtain information related to socio-economic conditions of the proposed project areas.

- Gather information on the compensation, resettlement and support of the Project to AP in the community;
- Get acceptance and support from the People's Committee to conduct the survey in the area.

609. A summary of the activities is presented in Table 2 and summary of discussions, concerns, and recommendations generated during the sections below.

Table X-2: Summary of Stakeholder Engagement for this modernization project

Types of engagement	Stakeholders	Contents covered in the meetings
Meetings with PBS authorities	➢ GM/DGM/AGM ➢ Line man ➢ Electrician	➢ Update about Project progress; ➢ Gain information related to purchasing land for substations, distributions line routes ➢ Grievance redress activities
Focused group discussion	➢ Indigenous people ➢ Vulnerable people ➢ Women ➢ Economical displacement community ➢ Host community	➢ Main livelihoods in this community ➢ Vulnerable status (i.e., gender, ethnicity, age, physical or mental ➢ disability, economic disadvantages, or social status that may be more adversely affected by the Project development); ➢ Support from authorities, other organizations for the local community (type of support); ➢ Perception on the Project and any concerns linked to the Project development; and ➢ Cultural activities/local traditions in this community
Key informant interviews	➢ Union Chairman ➢ Upazila Chairman ➢ Teacher ➢ Businessman ➢ Govt officials	➢ Historical demographic information of the affected villages; ➢ Infrastructure and services status; ➢ Main livelihoods in the area and income from those livelihoods; ➢ Public security and health status of local community; ➢ Education and employment status; ➢ Available unions in the area and role of women as well as youth in local activities; ➢ Advantages and disadvantages of the local community and support from authorities, other organizations for them

F. PLANNED STAKEHOLDER ENGAGEMENT ACTIVITIES

610. Stakeholder engagement activities will need to provide stakeholder groups with relevant information and opportunities to voice their views on topics that matter to them. Below table presents the stakeholder engagement activities for this project. BREB will undertake for their project(s). The activity types and their frequency are adapted to the three main project stages: project preparation (including design, procurement of contractors and supplies), construction, and operation and maintenance.

G. FEEDBACK MECHANISM

611. BREB has 27 customer service number. As well as BREB has emergency call center. Everyone can easily access the nnumber & these number are 24/7 operational. In addition in every PBSs have complait register log book. Anyone can register his complaint. Despite these all facilities BREB will follow some distict mechanism which are as foloows

- **Comment boxes:** Place comment boxes at public meetings and information centers for written feedback.
- **Suggestion hotline:** Establish a toll-free hotline where stakeholders can voice their concerns and suggestions.
- **Online feedback form:** Create an online feedback form on the project website for convenient and anonymous feedback.
- **Grievance redress mechanism (GRM):** Establish a clear and accessible GRM for stakeholders to report any issues or grievances related to the project.

Addressing Feedback:

- **Acknowledge Feedback:** Acknowledge all feedback received, even if it's negative.
- **Analyze Feedback:** Analyze the feedback to identify common themes and concerns.
- **Respond to Feedback:** Provide timely and clear responses to feedback, explaining how it's being considered or addressed. Regularly communicate how feedback is being incorporated into the project.

Table X-3: Planned Stakeholder Engagement Activities

Stage	Target Stakeholders	Topic(s) of Engagement	Method(s) Used	Location/Frequency	Responsibilities
STAGE 1: PROJECT PREPARATION (PROJECT DESIGN, SCOPING, RESETTLEMENT PLANNING, RPF/SEP DISCLOSURE)	**Project Affected People:** - People residing near the project area - Petty businessmen around the approach road - School teacher, guardians and students	- ESIA, ESMP, RPF, SEP disclosures - Assistance in gathering official documents for authorized land uses - Land Purchase Documents - Project scope and rationale - Project E&S principles - Grievance mechanism process	- Public meetings, separate meetings for women and vulnerable - Face-to-face meetings - Mass/social media communication (as needed) - Disclosure of written information - Grievance mechanism - BREB's newsletter and website	- Disclosure of ESIA, RPF, SEP, - At beginning of the construction work, all PBS area - Continuous communication through mass/social media and routine interactions	- BREB/PIU
	Other Interested Parties (External) - Union Parishad and UNO of Commanding Upazilla - Representative of Local people and community	- ESIA, ESMP, RPF, SEP disclosures - Land Purchase process - Identification of land /plots - Project scope, rationale and E&S principles - Grievance mechanism process	- Face-to-face meetings - Joint public/community meetings with local government - Public Disclosure	- Project launch meetings in BREB headquarter and PBS Office - Meetings in nearby school or college or as a when demanded by the affected community - Disclosure meetings in respective PBS.	- BREB/PIU - Socially responsible for the project
	Other Interested Parties (External) - Press and media - NGOs - Businesses and business organizations - Worker and Contractors - Workers' organizations - Academic institutions - National Government Ministries - General public, tourists, jobseekers	- ESIA, ESMP, RPF, SEP disclosures - Grievance mechanism - Project scope, rationale and E&S principles	- Public meetings, trainings/workshops (separate meetings specifically for women and vulnerable as needed) - Mass/social media communication - Disclosure of written information - Grievance mechanism - Notice board for employment recruitment	- Project launch meetings at BREB headquarters and PBS office - Meetings in project area as needed - Communication through mass/social media (as needed) - Information desks with brochures/posters in affected villages (continuous)	- BREB/PIU
	Other Interested Parties (External) - Other Government Departments including DoE from which	- Legal compliance issues - Project information scope and rationale and E&S principles - Coordination activities - Land acquisition process	- Face-to-face meetings - Invitations to public/community meetings - Submission of required reports	- Disclosure meetings - Reports as required	- BREB Team & management

Stage	Target Stakeholders	Topic(s) of Engagement	Method(s) Used	Location/Frequency	Responsibilities
	permissions/clearances are required; - Other project developers, donors	- Grievance mechanism process - ESIA/ESMP/RPF/SEP disclosures			
STAGE 2: CONSTRUCTION AND MOBILIZATION ACTIVITIES	**Project Affected People** - People potentially affected for the construction activities - People residing nearby project area	- Grievance mechanism - Health and safety impacts (EMF, community H&S, community concerns) - Employment opportunities - Project status	- Public meetings, open houses, trainings/workshops - Separate meetings as needed for women and vulnerable - Disclosure of written information - Grievance mechanism - BREB newsletter and website	- Quarterly meetings during construction seasons - Communication through mass/social media as needed - Notice boards updated weekly - Routine interactions	- BREB/PIU - Contractor/sub-contractors
	Other Interested Parties (External) - Press and media - NGOs - Businesses and business organizations - Workers' organizations - Academic institutions - National Government Ministries - Local Government Departments - General public, tourists, jobseekers	- Project information - scope and rationale and E&S principles - Project status - Health and safety impacts - Employment opportunities - Environmental concerns - Grievance mechanism process	- Public meetings, open houses, trainings/workshops - Disclosure of written information: brochures, posters, flyers, website, Information boards in BREB - Notice board(s) at construction sites - Grievance mechanism	Same as for PAPs	- BREB/PIU - Contractor/sub-contractors
	Other Interested Parties (Internal) - Other BREB's staff - Supervision Consultants - Contractor, sub-contractors, service providers, suppliers and their workers	- Project information: scope and rationale and E&S principles - Training on ESIA/ESMP requirements and other sub-management plans - Worker grievance mechanism	- Face-to-face meetings - Trainings/workshops - Invitations to public/community meetings	Daily, as needed	- BREB/PIU

Stage	Target Stakeholders	Topic(s) of Engagement	Method(s) Used	Location/Frequency	Responsibilities
STAGE 3: OPERATION AND MAINTENANCE	**Project Affected People:** - People residing nearby project area	- Satisfaction with engagement activities and GRM - Grievance mechanism process - Damage claim process	- BREB website - Grievance mechanism - BREB's newsletter	- Outreach as needed - Meetings in with local community as needed - Monthly (newsletter)	- BREB/PIU
	Other Interested Parties (External) - Press and media - NGOs - Businesses and business organizations - Workers' organizations - Academic institutions - Local Government Departments - General public, tourists	- Grievance mechanism process - Issues of concern - Status and compliance reports	- Grievance mechanism - BREB website - Face-to-face meetings - Submission of reports as required	As needed	- BREB/PIU

H. GRIEVANCE REDRESS MECHANISM

1. Formation and Operation of GRM

612. If the local/affected people have concerns or complaints about the EMP or its general components/activities, they may be referring to those issues. A strategy that acknowledges, evaluates and corrects these issues is taken. For the social and environmental performance of the project a grievance redress mechanism (GRM) will be set up to receive, assess & assist the settlement of impacted people's concerns, complaints and grievances. In addition, GRM is intended to be an effective means of addressing impacted people's issues, as well as a trustworthy approach to communicate and resolve project-related problems.

613. Public awareness campaigns will be conducted by PBS to raise the public's knowledge of the GRM. Publicize the contact phone number of the respective PBS in the media and on notice boards outside their offices and at building sites so that it may be used as complaints hotline. The project information booklet will include information on the GRM and will be widely disseminated within the project region by the PBS/RE. Members of the PBS/RE may register grievances in writing or by smartphone. Figure XI.1 shows how GRM will be applied for the project.

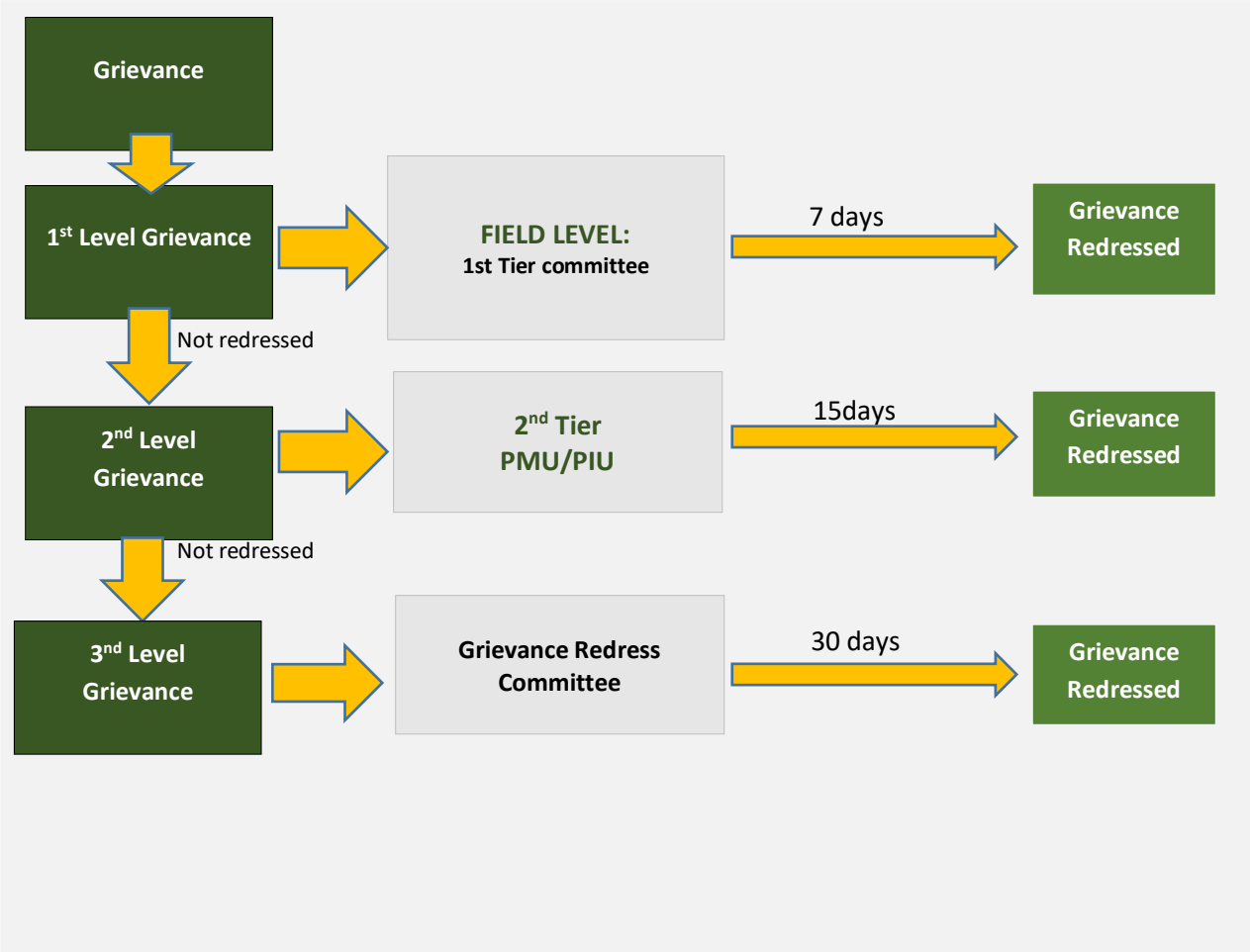


Figure X.1: Grievance Redress Mechanism of the Project

2. Steps to a Solutions

614. **First Tier of GRM:** For grievance redressal, the Local PBS authorities of the BREB and Contractors with assistance from PISCC should be responsible (1st tier). Within 7 working days, concerns will be resolved. Visits to the site and meetings with relevant stakeholders will be part of the grievance investigation process (e.g., affected persons, contractors, traffic

police, etc.) In the event that anonymity is desired, grievances will be logged and personal information (name, address, date of complaint, etc.) will be provided. Each grievance should be issued a tracking number that includes the following elements:

- When the complaint is registered, the complainant receives an acknowledgment of receipt along with the initial grievance document (which includes the description of the issue);
- Grievance monitoring sheet, mentioning actions taken (investigation, corrective measures); and
- One copy of the closure sheet will be given to the complainant once he or she has signed off on the resolution.

615. The updated register of grievances and complaints will be available to the public at the PBS office, construction site, and other key public offices along the project area. Should the grievance remain unresolved, it will be elevated to the second tier.

616. **Second Tier of GRM:** Unresolved issues will be forwarded on to the second layer of GRM by the Project director who is convenor of the committee (with written documentation). The PIU of BREB should establish the GRC before the start of site works. A hearing will be called with the GRC, if necessary, where the affected person can present his or her concerns and issues. The process will facilitate resolution through mediation. The local GRC will meet as necessary when there are grievances to be addressed. The local GRC will suggest corrective measures at the field level and assign clear responsibilities for implementing its decision within 15 working days. The contractor will have observer status on the committee. If unsatisfied with the decision, the existence of the GRC shall not impede the complaints' access to the government's judicial or administrative remedies. These issues are detailed in the table X-5.

617. **Third Tier of GRM: If** the grievance could not solve by the 2nd tier then it move into 3rd tier committee where Chief Engineer (Project) of BREB will act as convener of the committee. He addresses the unsolved issues; He call for a general meeting with the respective committee members. The all-committee member is shown in table X-5

618. The functions of the local GRC are as follows: (i) resolve problems and provide support to affected persons arising from various environmental issues, including dust, noise, utilities, power and water supply, waste disposal, traffic interference, and public safety, as well as social issues such as land acquisition, asset acquisition, and eligibility for entitlements, compensation, and assistance; (ii) reconfirm grievances of displaced persons, categorize and prioritize them, and aim to provide solutions within a month; and (iii) report to the aggrieved parties about developments regarding their grievances and decisions of the GRC. The SE, PIU will be responsible for processing and placing all papers before the GRC, maintaining the database of complaints, recording decisions, issuing minutes of the meetings, and monitoring to see that formal orders are issued, and the decisions carried out.

3. Construction Workers Grievance

619. Laborers and other unskilled hired employees of the contractor have little recourse when their living circumstances deteriorate, they are not paid according to agreement, or basic necessities, such as drinking water, are not provided at construction sites, work camps, or on-the-job. The contract or letter of assignment for the job will contain the name and contact information of a BREB and/or the RE's employee for the worker to contact under this contract as part of the written agreement with each hiring. A second statement will be included in the letter/agreement, stating that the contractor will not penalize the worker for filing a complaint, and that if this happens, the contract will be fined an amount equal to the duration of the employee's contract from the time of the incident to the end of the contract period. The complainant will receive that sum. The contractor will provide a complaint box, which will be sealed and collected by the PBS, allowing construction workers to file complaints with the PBS through XEN office.

The GRCs dealing with labor grievances/complaints will have members directly and indirectly associated with the construction and other works under the individual contract packages. Each GRC will have 5 members:

- Project Implementing Agency (BREB) the official who is in charge of all construction and other activities at individual worksites will act as convener;
- A male worker representing the workers;
- A female worker representing the workers;
- Resident engineer of the Construction Supervision Consultant;
- A PIU official, designated by the Project Director, is not associated with the construction activities in the field but a member of the PIU.

4. Gender-based Violence, Sexual Exploitation and Workplace Sexual Harassment

620. BREB/PIU will, with support from consultants, identify institutions and services provides who are actively engaged in the prevention of gender-based violence, sexual exploitation, and workplace sexual harassment to establish a manual for referencing any potential survivors. BREB/PIU, the project unit and the contractor are not equipped to handle complaints or provide relevant services to survivors but will refer any person to relevant service providers, including health facilities, law enforcement's gender unit or others, as relevant using the information on available services. Grievances related to gender-based violence be reported through the project/contractor, the nature of the complaint will be recorded along with the age of the complainant and relation to the project will be recorded but the issue will be referenced to relevant institutions. Also, the ESIA may identify additional mitigation measures related to gender and such measures will be reflected in site-specific ESMPs, including the contractors ESMP or contractors specific Labour Management Plans, where required. This will include engagement with communities on gender-related risks, grievance, and response measures available, as identified in the manual.

5. Communication & Awareness Raising on GRM

621. The final processes and procedures for the GRM will be translated into local language (i.e., Bangla) and disseminated at all project locations. These shall be made available (in both leaflet and poster format) to all project locations with the staff on site and in the offices at Villages, Upazila, District and Municipality. The affected persons and their communities will be informed of the project's grievance mechanism in open meetings at important locations and in PAP group meetings. Bangla translations of the RPF in the form of information brochures will be distributed among the affected persons. The PAPs will also be briefed on the scope of the GRC, the procedure for lodging grievances cases and the procedure of grievance resolution at the project level.

6. Grievance Redress Mechanism at Project Level & PBS

622. A three-tier project specifically Grievance Redress Mechanism (GRM) will be followed in this project. BREB has successfully completed some GoB funded projects [16]as well as donor funded projects like ADB[17] and WB. They have followed the same formats of GRM, and they are good at dealing with such types of grievances.

623. BREB will follow this mechanism for all upcoming projects. At this level, the grievances are reported to field officers of the complainant centers at each service area of the 21 PBSs in Rajshahi-Rangpur division. Any issues and grievances of technical, environmental health and safety, or involuntary resettlement nature such as compensation, land purchase-related issues, cutting down trees, distribution lines crossing over houses or home gardens, safety

[16] 1.5 million Consumer Connection through Rural Electrification Expansion Project", "Distribution Network Expansion for 100% Rural Electrification (Dhaka, Mymensingh, Chattogram and Sylhet Divisions) Project
[17] Modernization & Capacity Enhancement of BREB Network (Khulna Division)-Ongoing

issues electricity breakdowns, public health and safety, power fluctuations, defects in meter readings, electricity-related thefts, etc. can be raised to the field officers. PBS's Grievance Redress Committee (GRC) is the second level of resolution for concerns that cannot be handled by field officers within 7 days. An investigation committee was formed by BREB to consider a possible resolution. It interacts with local residents on behalf of BREB to ensure that difficulties are handled peacefully. The GRC is comprised of 5 members including PBS GM/SGM (convenor), members from the office of executive engineer, BREB, a member from PBS, a member from the consulting firm (in case of safeguard issues, safeguard consultant will attend), and a member from the contractor.

624. An effective grievance redress system plays a crucial role in promoting transparency, accountability, and justice within any organization or sector. In the context of women's groups, it becomes even more critical to ensure that their concerns and grievances are addressed promptly and effectively. Women often face unique challenges and vulnerabilities, and having a robust grievance redress system can help address issues such as gender-based discrimination, harassment, or unequal treatment.

625. In GRM process BREB is concerned about ensuring that the system is accessible to women from different backgrounds and locations. One female member from AGM or above level officials of concern PBS is included in the 1st tier of the GRC.

626. The GRC normally provides a solution within 15 days of receiving the grievance from the field officers. The details of the GRC are presented in Table I-4 & I-5:

Table X-4: Grievance Redress Committee at PBS (1st Tier)

Sl. No.	Members	Designation	Responsibility
1	Concern PBS's Sr.GM/GM	Convener	Organize a monthly or quarterly meeting
2	Concern Executive Engineer	Member	Summarized the grievances relating to environmental and social issues, construction-related issues, OHS and community health and safety issues and Gender-Based Violence, etc.
3	Asst Engineer of Concern SOD	Member	Recorded all issues and circulated among the Interested people.
4	AGM (MS) of concern PBS	Member secretary	Recorded all issues and circulated among the Interested people.
5	Female member from AGM or above level officials of concern PBS.	Member	Note discussions and decisions of the meeting and disseminate the information about GRM and taking follow-up actions.
6	Member from Consultant of concern PBS	Member	Note discussions and decisions of the meeting and disseminate the information about GRM and taking follow-up actions.

Table X-5: Grievance Redress Committee at Project Level (2nd Tier)

Sl. No.	Members	Designation	Responsibility
1	Project Director	Convener	To address the unsolved issues, He call for a general meeting with the respective committee members.
2	Deputy Project Director (Tech)	Member	Note discussions and decisions of the meeting and disseminate the information about GRM and taking follow-up actions.
3	Deputy Project Director (Admin)	Member	Recorded all issues and circulated among the Interested people.
4	Deputy Director (Finance)	Member	Note discussions and decisions of the meeting and disseminate the information about GRM and taking follow-up actions.

Table X-6: Grievance Redress Committee at Project Level (3rdd Tier)

Sl. No.	Members	Designation	Responsibility
1	Chief Engineer	Convener	To address the unsolved issues, He call for a general meeting with the respective committee members.

Sl. No.	Members	Designation	Responsibility
2	Additional Chief Engineer	Member	Note discussions and decisions of the meeting and disseminate the information about GRM and taking follow-up actions.
3	Director (Programme Planning)	Member	Recorded all issues and circulated among the Interested people.
4	Superintendent Engineer (E&S) Cell.	Member secretary	Recorded all issues and circulated among the Interested people.
Committee may co-opt additional member, if required.			

I. PROJECT-AFFECTED PEOPLE'S MECHANISM ON GRIEVANCE REDRESS ACTIVITY

627. When project-related concerns cannot be satisfactorily addressed through Project-level GRMs or the Bank's management processes, people who believe they have been or will be adversely affected by the Bank's failure to implement the ESP may submit complaints to the AIIB's PPM in accordance with the Policy on the PPM. The Bank requires all Clients to notify Project-affected individuals about PPM's availability. The Client's (or beneficiary's) Project-related website includes information on the availability of the PPM in an accessible and understandable manner in locally appropriate language(s).

J. MONITORING & REPORTING

628. ESS1 requires disclosure of the ESIA, including documentation of the consultation process and the results of the social impact assessment in a timely manner in accordance with the applicable provisions of ESS 1. Adequate documented evidence of such engagement should be provided.

629. The SEP will be periodically revised and updated by the Social Specialists as necessary during Modernization & Capacity Enhancement project planning and implementations in order to ensure that the information presented herein is consistent and is the most recent, and that the identified methods of engagement remain appropriate and effective in relation to the project context and specific phases of the development. Any major changes to the project-related activities and to its schedule will be duly reflected in the SEP.

630. Monthly summaries and internal reports on public grievances, enquiries and related incidents, together with the status of implementation of associated corrective/preventative actions will be collated by responsible staff and referred to the senior management of the project(s). The monthly summaries will provide a mechanism for assessing both the number and the nature of complaints and requests for information, along with the Project's ability to address those in a timely and effective manner.

631. The project director with the support of social and environment specialists will share the progress and results of the stakeholder engagement activities to the AIIB quarterly and annually where Stakeholder related activities will be described broadly. These reports will also include detailed reports on the GRM effectiveness, including a list of grievances received, addressed and the pending ones.

XI. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSION

632. Uninterrupted and sufficient electricity supply is one of the major requirements of Bangladesh's development plan. Given all the upcoming developments in Rajshahi-Rangpur division, a rural electrification distribution system should be implemented by 2025. As described in the previous sections of this ESIA report, the project's environmental impacts and risks have been assessed. The detailed design and pre-construction, construction and operation, and maintenance of the improved distribution infrastructure were identified as areas that could have negative impacts. To address all negative impacts identified, mitigation measures have been developed and included in the ESMP. Mitigation measures will be assured by a program of environmental supervision and monitoring to be conducted during the construction and operation stages.

633. BREB has a track record of effective project implementation, and it is currently implementing another MCEP project in the Khulna division, which is supported by ADB. All environmental and social factors are continuously monitored for compliance. Following these prior successful projects, BREB will supervise, monitor, and report on all planning and design, construction, operation, and maintenance activities related to this project, in accordance with the ESMP.

634. Nature and the socio-cultural environment will not be adversely affected by construction or operation of the project thanks to the detailed ESIA. No further studies are required for the renewal of the approval, but environmental clearance certificates (ECC) are required from the Department of Environment (DoE). Government of Bangladesh aims to provide everyone with access to a foldable and reliable electricity supply. Economic development and poverty reduction require access to affordable, reliable electricity. Bangladesh will not be able to achieve its national goals if it does not improve access to electricity, especially in rural areas. As a result, this project has contributed to achieving Ministry/Division and Implementing Agency goals in terms of vision, mission, and priorities.

635. Construction of proposed new substations and the installation of new 33 kV and 11 kV distribution lines will have short-term physical implications on the project. As per the guidelines of AIIB in line with GoB laws, possible mitigation measures have been suggested such as to control water pollution, noise and air pollution, waste management etc.

636. The construction of substations and 33 and 11 kV distribution lines pose a moderate risk to the health and safety of workers. To mitigate this risk, the installation contractor will be required to prepare and implement an occupational health and safety risk assessment and plan (including COVID-19, HIV and other infectious diseases risks) for approval before construction works

637. However, no infrastructure development can be anticipated to be without environmental consequences. The positive benefits on the nation and human beings will only be relevant, and long-term growth will only be achievable if the negative effects are avoided through the stringent maintenance and control procedures outlined for this project. All of these would necessitate careful attention and cost money, and the project authorities should take these factors into account.

638. Before the operation phase, a plan for responding to an emergency for hazardous materials and oil spills will be developed. A suitable drainage system with sedimentation ponds and oil separators will be provided to prevent contamination by run-off and oil spills.

639. This ESIA report is a live document & BREB will continuously update when all the detail design is completed as well as any further details information will be available to identify the risks and impacts and provide mitigation measures.

640. The environmental analysis has revealed that the project can be set up according to the proposed design and configuration in the proposed site and location. The environmental impacts are of a limited nature, whereas the benefits of the project are many.

B. RECOMMENDATION

641. A review of the Environmental & Social Impact Assessment (ESIA) reveals the following recommendations for enhancing Project performance and sustainability:

- Electrical system safety and proper grounding must be given priority. Grounding as per electrical norms & procedure of IEC/ANSI/BS should be followed in all electrical Substations, source lines & backbone lines as a safeguard against electrical hazards & unsafe operations. This will protect the insulator, cross arms, and lightning arrestors, especially in extreme weather conditions.
- Flood and other natural calamities in Bangladesh's North-Western zone, such as Rajshahi and Rangpur, have prompted the Power Ministry to specify and approve fitting fixtures and hardware, such as insulators, cross arms, and lightning arrestors, for use in substations, source lines, and backbone lines. Furthermore, line-span could be reduced in this area to withstand extreme weather conditions. In addition, in those hazardous/cyclone-prone areas, an indoor Gas Insulated Substation (GIS) of type 33/11 kV will be built.
- In order to increase the amount of greenery along embankment slopes and toes, native mixed trees should be planted wherever possible.
- Phase 1 Environmental Site assessment (ESA)* should be conducted after approval from AIIB for all the existing substations, and any further recommendations arising from the findings of the Phase 2 ESA will be done by BREB.
- A consulting firm should be commissioned by BREB to conduct the Phase- 1 ESA for all the existing substations, and any further recommendations arising from the findings of the Phase 1 ESA will be made by BREB.
- No construction of old S/S is cleared to have no legacy issue on contamination or corresponding recommended remediation is done for any contamination identified.

- APPENDICES

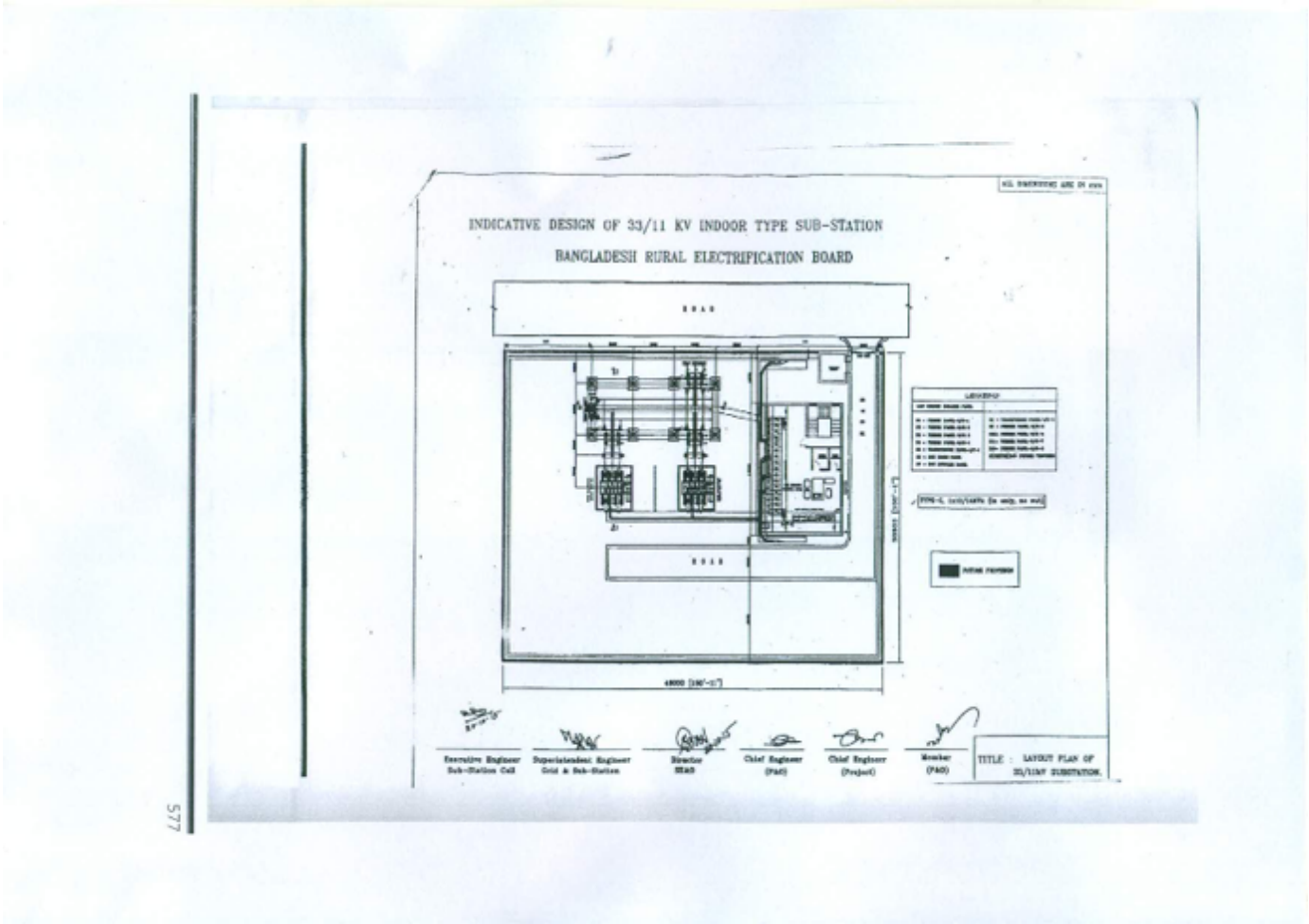
Appendix 1: Detailed of Proposed Sub Station Locations

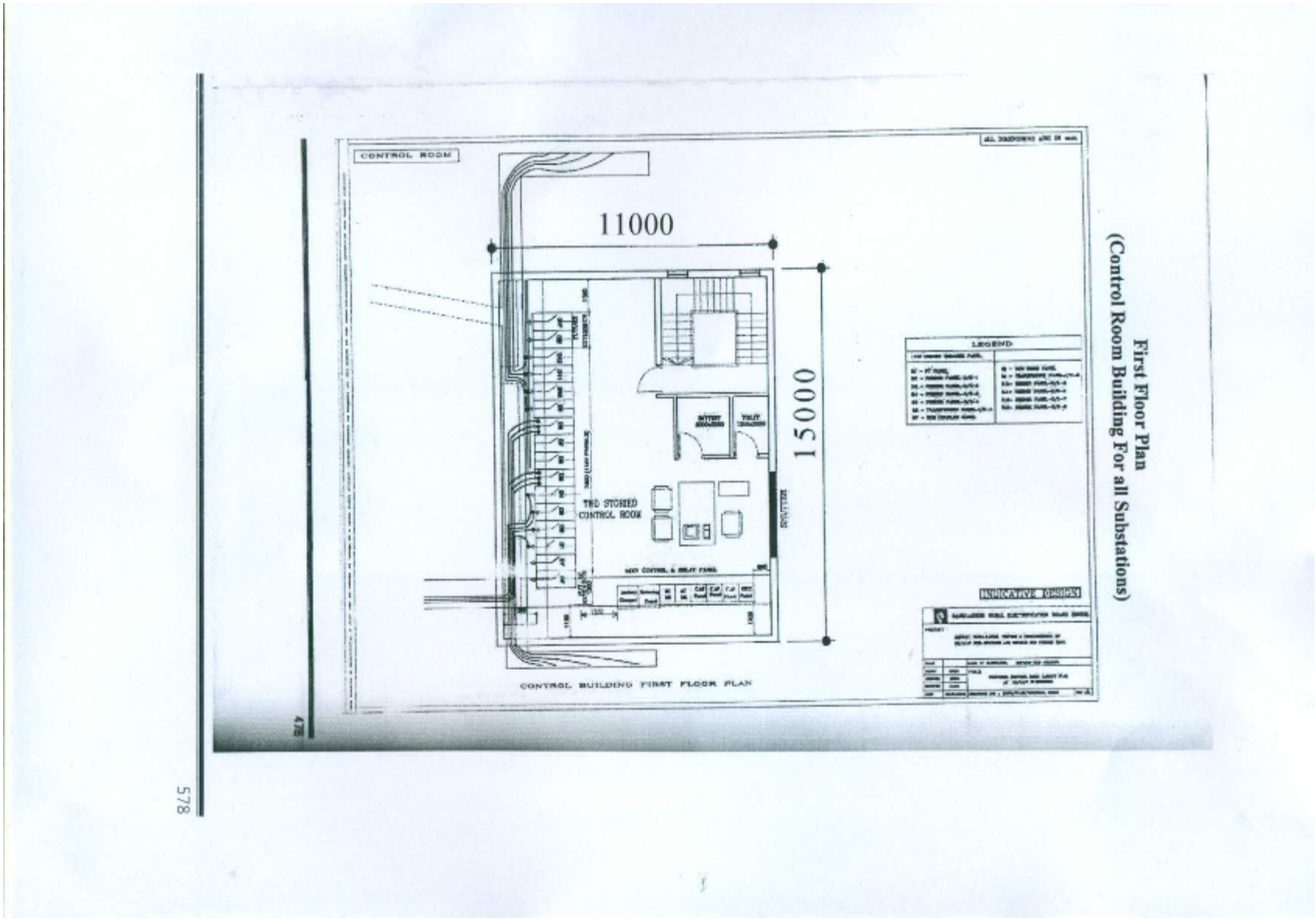
SL. No	Name of S/S	Voltage Level (kV)	Capacity (MVA)
Bagra PBS-1			
1	Bogra-3	33/11	10
2	Kahalu-2	33/11	10
3	Kahalu-3	33/11	10
4	Dupchachia-2	33/11	10
5	Adamdighi-2	33/11	10
6	Nandigram-3	33/11	10
7	Shibganj-4	33/11	10
Bogra PBS-2			
1	Gabtoli-3	33/11	10
2	BEZ	33/11	10
3	Dhunot-2	33/11	10
4	Shajahanpur-2	33/11	10
5	Gabtoli-4	33/11	10
6	Dhunot-3	33/11	10
7	Sherpur-4	33/11	10
Joypurhat PBS			
1	Joypurhat-4	33/11	10
2	Yet nor decided	33/11	10
Naogaon PBS-1			
1	Bodolgachi-2	33/11	10
2	Noagaon-4	33/11	10
3	Manda-4	33/11	10
Naogaon PBS-2			
1	Yet not decided	33/11	10
2	Yet not decided	33/11	10
3	Yet not decided	33/11	10
Natore PBS-1			
1	Singra-4 (Bamihal S/S)	33/11	10
2	Bagmara-5 (Jhikra)	33/11	10
3	Bagmara-4 (Gonipur)	33/11	10
4	Puthia-3 (Mollapara S/S)	33/11	10
5	Natore-4 (Dhalan S/S)	33/11	10
6	Yet not decided	33/11	10
Natore PBS-2			
1	Gurudaspur-3 (Shahibazar)	33/11	10
2	Lalpur-2 (Berilabari)	33/11	10
3	Charghat (Holdigachi)	33/11	10
4	Bagha-2 (Mirgong)	33/11	10
5	Lalpur-4 (Koloshnagar)	33/11	10
Pabna PBS-1			
1	Chatmohor-3 (Pachuria)	33/11	10
2	Bhangura-3 (Parmandapur)	33/11	10
3	Atghoria-3 (Khidirpur)	33/11	10
4	Pabna Sador-3 (Hemayetpur)	33/11	10
Pabna PBS-2			
1	Bera-3 (Koitola)	33/11	10
2	Santhia-3 (Dhulauri)	33/11	10
3	Pabna-3 (Dhublia)	33/11	10
4	Pabna-4 (Dhormogram)	33/11	10
Sirajganj PBS-1			
1	Ullapara-7 (Mohonpur)	33/11	10
2	Tarash-3 (Gulta)	33/11	10
3	Raigonj-4 (Dhangora)	33/11	10

*OFFICIAL USE ONLY

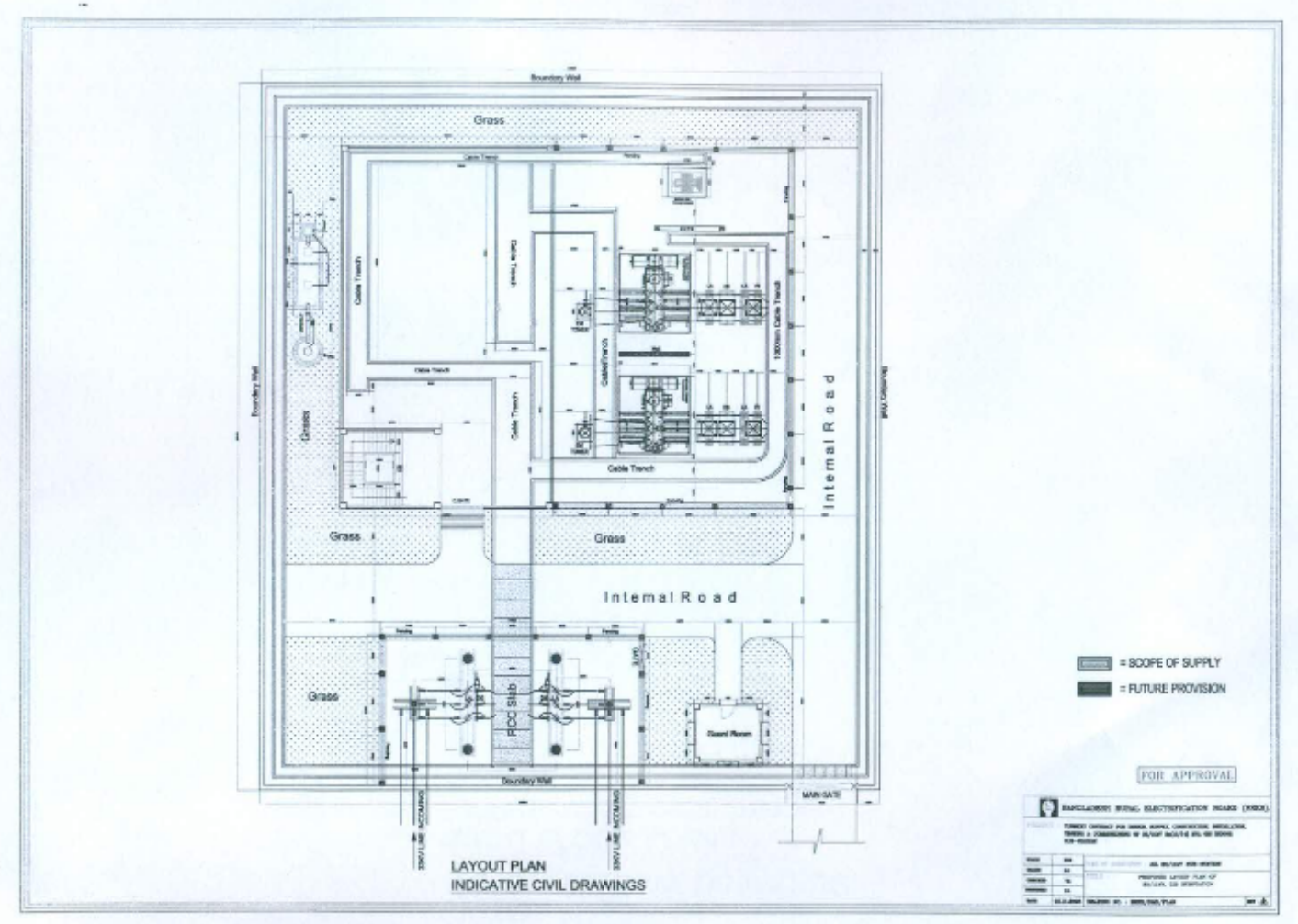
SL. No	Name of S/S	Voltage Level (kV)	Capacity (MVA)
Sirajgonj PBS-2			
1	Belkuchi-5 (Subarnachara)	33/11	10
2	Shirajganj-4 (Soydabad)	33/11	20
3	Kajipur-3 (Sonamukhi)	33/11	10
4	Shirajganj-5 (Saluavita)	33/11	10
Rajshahi PBS			
1	Durgapur	33/11	10
2	Godagari	33/11	10
3	Tanore (Kolma)	33/11	10
Chapainawabganj PBS			
1	Yet not decided	33/11	10
2	Yet not decided	33/11	10
3	Yet not decided	33/11	10
Dinajpur PBS-1			
1	Bochaganj (Bochaganj)	33/11	10
2	Dinajpur-4 (Kauga)	33/11	10
3	Chirirbandar -3 (Amtali)	33/11	10
Dinajpur PBS-2			
1	Ghoraghat-2 (Chakbamunia)	33/11	10
2	Nobabganj-3 (Bajitpur)	33/11	10
3	Birampur-3 (Ketrahat)	33/11	10
Kuri-Lal PBS			
1	Fulbari-1	33/11	10
2	Lalmonirhat-1	33/11	10
3	Aditmari-2	33/11	10
4	Kurigram-2	33/11	10
5	Rajarhat-2	33/11	10
Nilphamari PBS			
1	Kishorgeonj-2	33/11	10
2	Dimla-2	33/11	10
3	Joldhaka-2	33/11	10
Rangpur PBS-1			
1	Mithapukur-5	33/11	10
2	Sadullapur-2	33/11	10
3	Pirgacha-3 (Chahola)	33/11	10
Rangpur PBS-2			
1	Saidpur-1 (Khatamodhupur)	33/11	10
2	Rangpur-6 (Tampat)	33/11	10
3	Kaunia-3 (Mirbag)	33/11	10
4	Gangachara-3 (Esli)	33/11	10
5	Taraganj		10
6	Badarganj-3 (Laldighi)	33/11	10
Thakurgaon PBS			
1	Thakurgaon-5	33/11	10
2	Thakurgaon-7	33/11	10
3	Balaidanga-2	33/11	10
4	Panchogar-2	33/11	10
5	Autoari-2	33/11	10
Gaibandha PBS			
1	Saghata-2 (Barkona)	33/11	10
2	Polashbari-2 (Ghorabandha)	33/11	10

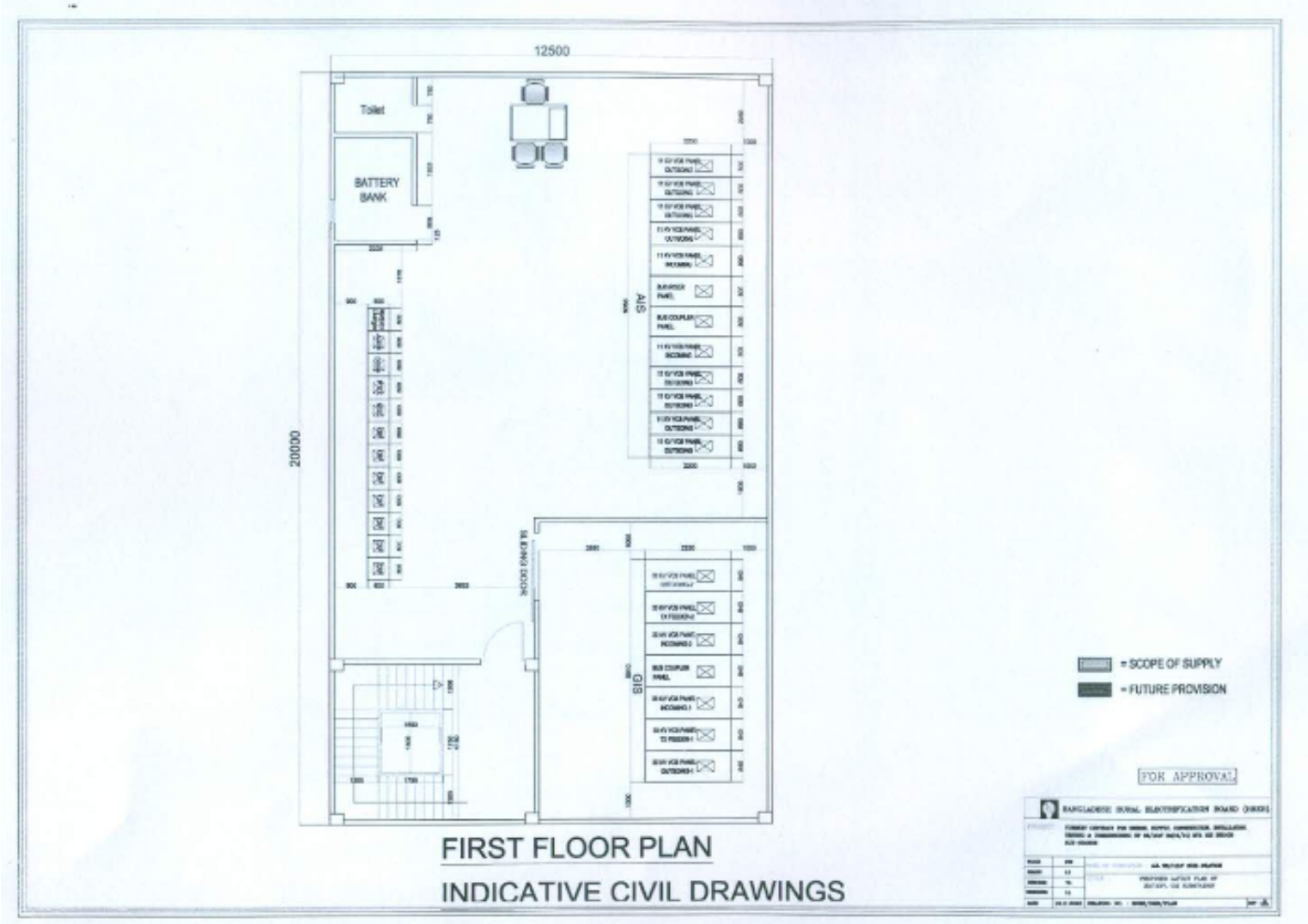
Appendix 2: Indicative Design of a 33/11 kV AIS Substations




CONTROL ROOM
11000
15000
TWO STORIED
CONTROL ROOM
LEGEND
CONTROL BUILDING FIRST FLOOR PLAN
First Floor Plan
(Control Room Building For all Substations)

Appendix 3: Indicative Design of a 33/11 kV GIS Substations




12500
20000
Toilet
BATTERY BANK
AIS
GIS
= SCOPE OF SUPPLY
= FUTURE PROVISION
FOR APPROVAL
FIRST FLOOR PLAN
INDICATIVE CIVIL DRAWINGS

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Appendix 4: Test Result of Air Quality Measurement

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DSCL LABORATORY 2021

Name of the Project	Modernization and Capacity Enhancement Project of BREB Network (Rangpur-Rajshahi Division)
Description of Sample	Ambient Air Quality
Sample Collector	Collected by DSCL Personnel
Sampling Date	26 October 2021 to 08 November 2021

Test Result of Ambient Air Quality Analysis

Sample ID	Location	GPS Location	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	NO_x (µg/m³)	SO_2 (µg/m³)	CO (ppm)	O_3 (µg/m³)
			AEROQUAL Series 500 Particulate matter monitors		AEROQUAL Series 500 NOx monitor	AEROQUAL Series 500 SOx monitor	CO Meter	O_3 Meter
AAQ_01	Khuttapara, Shahjahanpur, Bogra	N-24.787325* E 89.404508*	33.78	37.23	13.96	3.78	0.23	7.56
AAQ_02	Modonpur, Namuri, Polashi, Lalmonirhat	N-25.933843* E-89.312927*	54.34	47.87	12.45	2.78	0.86	15.78
AAQ_03	Mirbag, Kawria, Rangpur	N-25.760847* E-89.361374*	54.56	43.62	7.35	7.61	0.39	9.78
AAQ_04	Birol, Dinajpur	N-25.585834* E-88.542576*	76.32	53.63	11.85	5.86	0.75	12.67
AAQ_05	Sagorpur, Goborchapa, Beside Anowar Brick Field, Naogaon	N-25.002121* E-88.959550*	80.36	61.72	21.23	24.76	1.78	10.93
AAQ_06	Alipur, Gurdaspur, Natore	N-24.344171* E-89.104993*	47.53	39.15	4.38	9.53	0.46	6.47
Weather Condition	Mostly Sunny							
Standard for Ambient Air Quality according to DoE, Bangladesh			150	65	100	365	9	157

Note:
*** The Bangladesh National Ambient Air Quality Standards have been taken from the Environmental Conservation Rules, 1997 which was amended on 19th July 2005 vide S.R.O. No. 220-Law/2005.*

Sample site Description

Location	Sample Site Description
Khuttapara, Shahjahanpur, Bogra (AAQ_01)	➢ The weather was sunny during the monitoring period. ➢ Visible dust particles were moderate. ➢ Traffic movement was moderate. ➢ People's movement was low. ➢ Moderate level of agricultural land.
Modonpur, Namuri, Polashi, Lalmonirhat (AAQ_02)	➢ The weather was sunny. ➢ Visible dust particles were moderate. ➢ Traffic movement was high. ➢ People's movement was low. ➢ Beside Tista-Patgram Highway.
Mirbag, Kawrnia, Rangpur	➢ The weather was sunny. ➢ Visible dust particles were moderate.

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Location	Sample Site Description
(AAQ_03)	➢ Traffic movement was high. ➢ People's movement was moderate. ➢ Beside Rangpur-Lalmonirhat Highway. ➢ Vegetation covers were moderate.
Birol, Dinajpur (AAQ_04)	➢ The weather was sunny during the monitoring period. ➢ Visible dust particles were moderate. ➢ Traffic movement was moderate. ➢ People's movement was low.
Sagorpur, Goborchapa, Bodolgachi, Naogaon (AAQ_05)	➢ Besides road and a brickfield. ➢ Visible dust particle was high. ➢ The weather was sunny during the monitoring period. ➢ People movement was moderate. ➢ Vehicle movement was comparatively moderate.
Alipur, Gurudaspur (Beside Alipur Baitul Anam Jame Mpsque), Bodolgachi, Natore. (AAQ-06)	➢ The weather was sunny during the monitoring period. ➢ Visible dust particle was low. ➢ People movement was low. ➢ Vehicle movement was moderate.

Test Performed By
Boloram Karmaker
Junior Environmental Specialist

Development Solutions Consultant Limited * DSCL *

Checked By
Saiful Islam Imran
Deputy Manager

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Appendix 5: Test Result of Noise Level Measurement

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DSCL LABORATORY 2021

Name of the Project	Modernization and Capacity Enhancement Project of BREB Network (Rangpur-Rajshahi Division)
Description of Sample	Noise Level Measurement
Sample Collector	Collected by DSCL Personnel
Sampling Date	26 October 2021 to 08 November 2021

Test Result of Noise Monitoring

Sample ID	Location	GPS Location	Land Use Category	Measurement Time		Noise Level
				Day		Day
				Start	End	
NM_01	Khuttapara, Shahjahanpur, Bogra	N-24.787325° E 89.404508°	Residential	10:10 am	10:40 am	47.56
NM_02	Modonpur, Namuri, Polashi, Lalmonirhat	N-25.933830° E-89.313060°	Residential	03:20 pm	03:50 pm	64.5
NM_03	Mirbag, Kawria, Rangpur	N-25.760949° E-89.361476°	Residential	03:03 pm	03:33 pm	68.16
NM_04	Birol, Dinajpur	N-25.585834° E-88.542576°	Residential	12:15 pm	12:45 pm	57.91
NM_05	Alipur, Gurdaspur, Natore	N-24.344110° E-89.104993°	Residential	01:25 pm	01:55 pm	51.64
NM_06	Sagorpur, Goborchapa, Noagaon	N-25.002198° E-88.959503°	Residential	01:00 pm	01:30 pm	49.76

Notes

- *Land use category is based on the classification provided in the Noise Pollution Control Rules (2006).*
- *The sound level standard for the Residential area at day time is 55 dBA, and night time is 45 dBA.*
- *The sound level standard for the mixed areas at day time is 60 dBA and night time is 50 dBA.*
- *Noise level is the average noise recorded over the duration of the monitoring period.*

Sample Site Description

Location	Sample Site Description
Khuttapara, Shahjahanpur, Bogra **(NM_01)**	➢ Traffic movement was moderate. ➢ People's movement was low. ➢ Residential area.
Modonpur, Namuri, Polashi, Lalmonirhat **(NM_02)**	➢ Traffic movement was high. ➢ People's movement was moderate. ➢ Beside Lalmonirhat-Patgram highway.
Mirbag, Kawria, Rangpur **(NM_03)**	➢ Traffic movement was high. ➢ People's movement was low. ➢ Beside Lalmonirhat-Kurigram highway.
Birol, Dinajpur **(NM_04)**	➢ Traffic movement was moderate. ➢ People's movement was low. ➢ Some construction activities were noticed surroundings the project area.

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Location	Sample Site Description
Alipur, Gurdaspur, Natore **(NM_05)**	➢ Traffic movement was moderate. ➢ People's movement was moderate. ➢ Residential Area ➢ Beside Road.
Sagorpur, Goborchapa, Noagaon **(NM_06)**	➢ Traffic movement was high. ➢ People's movement was moderate. ➢ Residential Area.

Test Performed By
Boloram Karmaker
Junior Environmental Specialist

Development Solutions Consultant Limited * DSCL *

Checked By
Saiful Islam Imran
Deputy Manager

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Appendix 6: Test Result of Groundwater Quality

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DSCL LABORATORY 2021

Name of the Project	Modernization and Capacity Enhancement Project of BREB Network (Rangpur-Rajshahi Division)
Description of Sample	Ground Water Quality
Sample Collector	Collected by DSCL Personnel
Sampling Date	26 October 2021 to 08 November 2021

Test Result of Groundwater Quality

Parameter	Unit	GW_01 Khottapara, Shahjahanpur, Bogra N- 24.787357 E- 89.404767	GW_02 Modonpur, Polashi, Lalmonirhat N- 25.933803 E- 89.311287	GW_03 Mirbag, Kawnia, Rangpur N- 25.760756 E- 89.361436	GW_04 Birol, Dinajpur N- 25.586075 E- 88.542650	GW_05 Goborchipa, Sagorpur, Naogaon N- 25.001436 E- 88.961365	GW_06 Alipur, Gurudaspur, Natore N- 24.344879 E- 89.104807	Standards for potable water*	Method of Analysis
pH*	-	7.13	6.9	6.46	7.91	8.12	6.93	6.5-8.5	Multimeter
Total Dissolved Solids (TDS)*	mg/L	252	165	170	183	182	555	1000	Multimeter
ORP*	mV	-384	-294	16.2	15.9	-87.9	-239	NYS	Multimeter
Electric Conductivity (EC)*	µs/cm	564	252	259	289	278	844	NYS	Multimeter
Temperature*	°C	27.9	26.2	27.0	29.1	27.0	26.5	NYS	Multimeter
Salinity*	mg/L	1.65	125	129	138	137	421	NYS	Multimeter

Note:
*** Standard for potable water is followed the Environmental Conservation Rules, 1997, which was amended on 19 July 2005 vide S.R.O. No. 220-Law/2005.*

Sample site Description

Sample Location and I.D.	Sample Site Description
Khottapara, Shahjahanpur, Bogra **GW_01**	➢ It was established in 2019. ➢ Depth is about 70 feet around. ➢ Septic tank distance is 5m around. ➢ The distance of agricultural land is 7m around. ➢ They were usually used for household purposes.
Modonpur, Polashi, Lalmonirhat **GW_02**	➢ It was established in 2014. ➢ Depth is about 90 feet around. ➢ Septic tank distance is 30 feet around. ➢ The distance of agricultural land is 10m around. ➢ They are usually used for household purposes.
Mirbag, Kawnia, Rangpur **GW_03**	➢ It was established in 2016. ➢ Depth is about 75 feet around. ➢ Septic tank distance is 50m feet around. ➢ The distance of agricultural land is 15m around. ➢ They are usually used for drinking and other purposes.

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Birol, Dinajpur **GW_04**	➢ It was estabiished in 2020. ➢ Depth is about 90 feet around. ➢ Septic tank distance is 30m feet around. ➢ The distance of agricultural land is 10m around. ➢ They are usually used for drinking and other purposes.
Goborchapa, Shagorpur, Naogaon **GW_05**	➢ It was established in 2018. ➢ Depth is about 110 feet around. ➢ Septic tank distance is 10m feet around. ➢ The distance of agricultural land is 20m around. ➢ They are usually used for drinking and household purposes.
Alipur, Gurudashpur, Natore **GW_06**	➢ It was established in 2017. ➢ Depth is about 90 feet around. ➢ Septic tank distance is 20m feet around. ➢ The distance of agricultural land is 30m around. ➢ They are usually used for drinking and other purposes.

Test Performed By
Boloram Karmaker
Junior Environmental Specialist

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Checked By
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Appendix 7: Test Result of Surface Water Quality

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DSCL LABORATORY 2021

Name of the Project	Modernization and Capacity Enhancement Project of BREB Network (Rangpur-Rajshahi Division)
Description of Sample	Surface water Quality
Sample Collector	Collected by DSCL Personnel
Sampling Date	26 October 2021 to 08 November 2021

Test Result of Surface water Quality

Parameters	Unit	SW_01	SW-02	SW_03	SW_04	SW_05	SW_06	Standards for Surface Water (best practice for fishing) by ECR'97	Analysis Method
		Khottapara, Shahjahanpur, Bogra	Modonpur, Polashi, Lalmonirhat	Mirbag, Kawnia, Rangpur	Birol, Dinajpur	Goborchipa, Sagorpur, Naogaon	Alipur, Gurudaspur, Natore		
		N-24.792203 E-89.406331	N-25.933311 E-89.311384	N-25.760903 E-89.361700	N-25.584910 E-88.545670	N-25.001613 E-88.960054	N-24.344634 E-89.104948		
pH*	-	6.78	7.8	6.20	6.65	7.61	7.4	6.5-8.5	Multimeter
Total Dissolved Solids (TDS)*	mg/L	100	150	146	114.9	78.3	363	NYS	Multimeter
ORP*	mV	209	-332	75.5	-89.6	-52.3	-293	NYS	Multimeter
Electric Conductivity (EC)*	µs/cm	277	238	227	195.2	120.2	552	NYS	Multimeter
Temperature*	°F	30.0	30.5	29.5	29.7	28.5	26.7	-	Multimeter
Salinity*	mg/L	136	113	110	83.5	58.8	275	-	-

Note:
*** Standard for Inland Surface water is followed the Environmental Conservation Rules, 1997 which was amended on 19th July 2005 vide S.R.O. No. 220-Law/2005.*

Sample site Description

Sample Location and I.D.	Sample Site Description
Khottapara, Shahjahanpur, Bogra **SW_01**	➢ Water remains all the year. ➢ Visible pollutant is very high. ➢ Use for bathing and other washing purposes.
Modonpur, Polashi, Lalmonirhat **SW_02**	➢ Water did not remain all the year ➢ Depth is about 5-7 feet. ➢ Moderate visible pollutant.

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Mirbag, Kawnia, Rangpur **SW_03**	➢ Water remains all the year ➢ Depth is about 4-5 feet. ➢ Visible pollutant is low.
Birol, Dinajpur **SW_04**	➢ Water remains all the year. ➢ Visible pollutant low. ➢ Surrounded by the agricultural land.
Goborchapa, Shagorpur, Naogaon **SW_05**	➢ Water remains all the year. ➢ There was full of hyacinth. ➢ Visible pollutant low. ➢ Used for fishing purposes.
Alipur, Gurudashpur, Natore **SW_06**	➢ Water remains all the year. ➢ Depth was about 10-12 feet. ➢ Used for fishing purposes.

Test Performed By
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Appendix 8: Photoplate of Existing Substations

Dinajpur Sadar-1, 33/1 kV 20MVA Substation, Dinajpur PBS

Substation Compund, Dinajpur PBS-1

Belkuchi-1, 33/1 kV 30MVA Substation, Sirajganj PBS-2

Old Transformer at Thakurgaon PBS

Substation Compound, Joypurhat PBS

Gaibandha Sadar-1, 33/1 kV 10MVA Substation, Gaibandha PBS

33/1 kV 25MVA Substation, Rangpur PBS-2

Materials at belkuchi Jonal office, Sirajganj

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Materials, laying in the substation site at hanail, joypurhat PBS	**Substation Compound , Rangpur PBS-2**
	
substation site at jagarnnathpur, Thakurgaon PBS	**substation site at uttar Gobindopur, Dinajpur PBS**

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Appendix 9: Photoplate of Purchased land for Substations

<table>
<tr><td>  </td><td> 
</td></tr>
<tr><td>Shajahanpur-2 (Khottapara), Bogra PBS-2</td><td>Kaunia-3 (Mirbag), Rangpur PBS-2</td></tr>
<tr><td>  </td><td> 
</td></tr>
<tr><td>Pirganj-2 (Jabarhat), Thakurgaon PBS</td><td>Birol-2 (Ranipukur), Dinajpur PBS-1</td></tr>
</table>

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Appendix 10: Attendance List of FGD

ISO 9001, ISO 14001, ISO 45001 Certified

শেখ হাসিনার উদ্যোগ ঘরে ঘরে বিদ্যুৎ

বাংলাদেশ পল্লী বিদ্যুতায়ন বোর্ড

BANGLADESH RURAL ELECTRIFICATION BOARD

Modernization and Capacity Enhancement of BREB network (Rajshahi-Rangpur Division) Project

List of Participants for Focus Group Discussion

Address: খুকশাসোনাখালী, বেলকুচি, সিরাজগঞ্জ

GPS Location: 24.262873°, 89.671824°

Date: 27-03-2021

Time: 11:20 am – 12:10 pm

SL No.	Participant's Name	Age	Occupation	Telephone No.	Signature
1	মোঃ মিলন সরকার	31	চাকরীজীবি	01762049875	[signature]
2	মোঃ নুরুন নবী	22	ভ্যানচালক	01676395950	[signature]
3	মোঃ রফিকুল ইসলাম	26	ভ্যানচালক	01921207981	রফিক
4	মোঃ আরিফুল ইসলাম	23	ছাত্র	01751521924	[signature]
5	মোঃ বাদশাহ	25	ভ্যানচালক	01774586170	বাদশাহ
6	আব্দুল আলিম	29	তাতশ্রমিক	01488439170	আলিম
7	প্রত্যয় সরকার	19	ছাত্র	01771929604	প্রত্যয়
8	রুবেল ইসলাম	29	কৃষক	01640982147	Rubel
9	মেহবুব আলম	22	ড্রাইভার	01724040911	[signature]
10	রাজিব হোসেন	30	কৃষক	01948717120	[signature]
11	আজিজার রহমান	29	কৃষক	01720191872	[signature]
12					
13					
14					
15					

Facilitated By: A.B.M. Rashed Alam

Signature: [signature]

IIFC

Organized by DSCL

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BANGLADESH RURAL ELECTRIFICATION BOARD

ISO 9001, ISO 14001, ISO 45001 Certified

Modernization and Capacity Enhancement of BREB network (Rajshahi-Rangpur Division) Project

List of Participants for Focus Group Discussion

Address: ১০ নং ইউনিয়ন, নীলফামারী

GPS Location: 25.889631, 88.853256°

Date: 31-03-2021

Time: 10:12 am - 11:00 am

SL No.	Participant's Name	Age	Occupation	Telephone No.	Signature
1	MD. Raju Ahmed	26	Job Holder	01721702150	[signature]
2	Abdel Malek	27	Job Holder	01750890626	[signature]
3	Nasmul Hossain	19	Student	01907309336	Najmul
4	Mazedul Islam	18	Student	01907218718	[signature]
5	Mohammad Shahin	30	Business		Shahin
6	Omar Sharif Rubel	26	Job Holder	01621255921	[signature]
7	Ehsan Ali	27	Driver	01829600068	এহসান
8					
9					
10					
11					
12					
13					
14					
15					

Facilitated By: A.B.M. Rashed Alam

Signature: [signature]

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বাংলাদেশ পল্লী বিদ্যুতায়ন বোর্ড

BANGLADESH RURAL ELECTRIFICATION BOARD

Modernization and Capacity Enhancement of BREB network (Rajshahi-Rangpur Division) Project

List of Participants for Focus Group Discussion

Address Khuttaparca, Shajahanpur, Bogra

GPS Location 24.786522, 89.404020

Date 28-03-2021 **Time** 12:01 pm – 12:50pm

SL No.	Participant's Name	Age	Occupation	Telephone No.	Signature
1	Al-Amin	19	Student	01887857453	
2	Nur Islam	17	Student	01310287100	
3	Anisur Rahman	40	Driver		
4	Juwel	35	Businessman	01736061686	
5	Mahamudul Hasan	20	Student	01867648707	
6	Anamul Haque	28	Businessman	01308629000	
7	Al-Mamun	17	student		
8	Sazzad Rahman	27	Student	01819110097	
9					
10					
11					
12					
13					
14					
15					

Facilitated By A.B.M. Rashed Alam

Signature

IIFC

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ISO 9001, ISO 14001, ISO 45001 Certified

বাংলাদেশ পল্লী বিদ্যুতায়ন বোর্ড

BANGLADESH RURAL ELECTRIFICATION BOARD

Modernization and Capacity Enhancement of BREB network (Rajshahi-Rangpur Division) Project

List of Participants for Focus Group Discussion

Address 10 no. Jabor kut, Pirganj, Thakurgoan

GPS Location 25.774236, 88.370444

Date 31-03-2024 **Time** 02:15 Pm - 03:00 pm

SL No.	Participant's Name	Age	Occupation	Telephone No.	Signature
1	MD. Ansarul Islam	30	Job Holder	01761026559	Ansarul
2	Azam Hassan	25	Student	01755362618	Azam
3	MD. Azim Uddin	50	Job Holder	01744325819	Azim
4	Mohim Uddin	65	Job Holder	01738254693	
5	MD. Abdur Rashid	50	Job Holder	01763228347	
6	MD. Roknuzzaman	30	Politician	01739112226	
7	MD. Ali Azad	28	Student	01738549934	Ali
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Facilitated By A.B.M. Rashed Alam

Signature

IIFC

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বাংলাদেশ পল্লী বিদ্যুতায়ন বোর্ড

BANGLADESH RURAL ELECTRIFICATION BOARD

Modernization and Capacity Enhancement of BREB network (Rajshahi-Rangpur Division) Project

List of Participants for Focus Group Discussion

Address Badargonj, Rangpur (7no. Govindathpur)

GPS Location 25.796517°, 89.148307°

Date 29/03/21 **Time** 02:15 pm – 3:00 pm

SL No.	Participant's Name	Age	Occupation	Telephone No.	Signature
1	Mohammad Abdul Awal	26	ব্যবসায়ী	01797646352	
2	Waheduzzaman	30	চাকুরী	01723846091	
3	MD. Fielies	41	কৃষি	01721613904	
4	Saiful Islam	40	ব্যবসায়ী	01936847873	
5	Mohammad Antjel	16	ছাত্র		
6	Nuruzzaman	40	ব্যবসায়ী	01921599309	
7	Raju Ahmed	22	ছাত্র	01751929126	
8	Sadequl Shaon	29	Job Holder	01985527978	
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Facilitated By A.B.M. Rashad Alam

Signature Rashad

IIFC

Organized by DSCL

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বাংলাদেশ পল্লী বিদ্যুতায়ন বোর্ড

BANGLADESH RURAL ELECTRIFICATION BOARD

ISO 9001, ISO 14001, ISO 45001 Certified

Modernization and Capacity Enhancement of BREB network (Rajshahi-Rangpur Division) Project

List of Participants for Focus Group Discussion

Address: বাজার রোড, বিরল, দিনাজপুর

GPS Location: 25.637268°, 88.555676°

Date: 01-04-21

Time: 11:10 am to 11:50 am

SL No.	Participant's Name	Age	Occupation	Telephone No.	Signature
1	Md. Noyon Ali	22	Farmer	01793972611	[signature]
2	Md. Altab	64	Worker	01831513790	[signature]
3	Md. Akkas Ali	79	Business	01745253029	[signature]
4	Md. Maruf Hossain	28	Driver	01319231535	[signature]
5	Sumon Patwary	37	Shopkeeper	01779040379	[signature]
6	Protik Ahmed	22	Student	01305588149	Protik Ahmed
7	Al-Amin	21	Student	01813042122	[signature]
8	Sagor Hasan	32	Farmer	01647908271	[signature]
9	Md. Nayeem	25	Worker	01790444219	[signature]
10					
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13					
14					
15					

Facilitated By: A.B.M. Rashed Alam

Signature: [signature]

IIFC

Organized by DSCL

ISO 9001, ISO 14001, ISO 45001 Certified

বাংলাদেশ পল্লী বিদ্যুতায়ন বোর্ড

BANGLADESH RURAL ELECTRIFICATION BOARD

Modernization and Capacity Enhancement of BREB network (Rajshahi-Rangpur Division) Project

List of Participants for Focus Group Discussion

Address ছিলমি বাজার, কালাই জয়পুরহাট, জয়পুরহাট

GPS Location 25.087528°, 89.069460°

Date 01-04-21 **Time** 04:20 pm - 05:00pm

SL No.	Participant's Name	Age	Occupation	Telephone No.	Signature
1	Bozlur Rahman	40	Business	017-16164873	
2	Nasir Uddin	62	Foreman	01423703958	
3	Md. Shahar Uddin	63	Foreman	01939439170	
4	Abdul sattar	42	Driver	01788433917	
5	Md. kazol Mia	45	Worker	01746752364	
6	Abdul Mannan	65	Foreman	01992019590	
7	Md. Babul Hossain	32	Worker	01774586168	
8	Yeasin Bhuiyan	35	Foreman	01723101470	
9	Siddik	48	Shopkeeper	01735873775	
10	Rubel Hassan	33	Driver	01928458237	
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Facilitated By A.B.M. Rashed Alam

Signature

IIFC

Organized by DSCL

*OFFICIAL USE ONLY

Appendix 11: No Objection Certificates (NOCs) from Local Authority

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
জেলা প্রশাসকের কার্যালয়
গাইবান্ধা।
(সাধারণ শাখা)
www.gaibandha.gov.bd

স্মারক নং-০৫.৫৫.৩২০০.০২২.২৭.০০১.২০২১-১৫৫২ তারিখঃ ২৬ চৈত্র ১৪২৭ / ০৯এপ্রিল ২০২১

বিষয় : ' রাজশাহী -রংপুর বিভাগের অন্তর্গত একুশটি পল্লী বিদ্যুৎ সমিতির আধুনিকায়ন এবং সক্ষমতা বৃদ্ধি প্রকল্প' বাস্তবায়নের লক্ষ্যে পরিবেশগত ছাড়পত্রের জন্য অনাপত্তি পত্র ।

১। আবেদনকারীর নাম : জনাব মোঃ শহিদুল ইসলাম, তত্ত্বাবধায়ক প্রকৌশলী (অঃদাঃ)

২। সংস্থার নাম : বাংলাদেশ পল্লী বিদ্যুতায়ন বোর্ড

৩। আবেদনকারীর ঠিকানা : প্রধান কার্যালয়, নিকুঞ্জ-২,খিলক্ষেত, ঢাকা-১২২৯

৪। প্রকল্পের অবস্থানগত ঠিকানা : রাজশাহী ও রংপুর বিভাগের জেলাসমূহ

৫। প্রকল্পের তফসিল :

জেলার নাম	উপজেলার নাম
গাইবান্ধা	গাইবান্ধা সদর, সুন্দরগঞ্জ, সাদুল্লাপুর, পলাশবাড়ী, গোবিন্দগঞ্জ, সাঘাটা, ফুলছড়ি,

৬। কারখানা/প্রকল্পের উৎপাদিত /উৎপাদিতব্য পন্যের নামঃ বিদ্যুৎ বিতরণ।

উপরোক্ত তথ্যাদির আলোকে 'রাজশাহী, রংপুর বিভাগের অন্তর্গত একুশটি পল্লী বিদ্যুৎ সমিতির আধুনিকায়ন এবং সক্ষমতা বৃদ্ধি' শীর্ষক উন্নয়ন প্রকল্পকে নিম্নবর্ণিত শর্তসাপেক্ষে অনাপত্তি পত্র প্রদান করা হলো।

শর্তাবলী :

১। প্রকল্প স্থাপন ও পরিচালনার ক্ষেত্রে পরিবেশ সংরক্ষণ আইন বিধি যথাযথভাবে অনুসরণ করতে হবে।
২। পরিবেশ অধিদপ্তর হতে বিধি দ্বারা নির্ধারিত পদ্ধতিতে ছাড়পত্র গ্রহণ করতে হবে।
৩। কর্মরত শ্রমিকদের পেশাগত স্বাস্থ্য ও নিরাপত্তা নিশ্চিত করতে হবে।
৪। উপযুক্ত অগ্নি নির্বাপক ব্যবস্থা রাখতে হবে এবং অগ্নিকান্ড কিংবা অন্য কোন দুর্ঘটনার সময় জরুরি নির্গমন ব্যবস্থা থাকতে হবে।
৫। বায়ু ও শব্দ দূষণ করা যাবে না।
৬। প্রকল্প সৃষ্ট তরল বর্জ্য অপরিশোধিত অবস্থায় বাইরে নির্গমন করা যাবে না।

উল্লিখিত যে কোন শর্ত লঙ্ঘন করলে যথোপযুক্ত কর্তৃপক্ষ কর্তৃক প্রকল্পের বিরুদ্ধে আইনানুগ ব্যবস্থা নেয়া যাবে।

০৯/০৪/২০২১

(মোঃ আবদুল মতিন)
জেলা প্রশাসক
গাইবান্ধা।
ফোনঃ ০৫৪১-৫১২২৬(অঃ)
৫১৪০৬(বাঃ)

তত্ত্বাবধায়ক প্রকৌশলী (অঃদাঃ)
পরিবেশ ও সামাজিক ব্যবস্থাপনা দপ্তর
'রাজশাহী-রংপুর বিভাগের অন্তর্গত একুশটি পল্লী বিদ্যুৎ সমিতির
আধুনিকায়ন এবং সক্ষমতা বৃদ্ধি প্রকল্প '
বাংলাদেশ পল্লী বিদ্যুতায়ন বোর্ড, প্রধান কার্যালয়
নিকুঞ্জ-২, খিলক্ষেত, ঢাকা-১২২৯।

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
জেলা প্রশাসকের কার্যালয়, বগুড়া
সাধারন শাখা
www.bogra.gov.bd

স্মারক নম্বর: ০৫.৫০.১০০০.০০৬.১০.০০১.২১.৩৪৪

তারিখ: ২৮ চৈত্র ১৪২৭
১১ এপ্রিল ২০২১

বিষয়: **পরিবেশগত ছাড়পত্রের জন্য স্থানীয় কর্তৃপক্ষ কর্তৃক প্রদেয় অনাপত্তি পত্রের ছক**

১। আবেদনকারীর নামঃ মোঃ শহিদুল ইসলাম, তত্ত্বাবধায়ক প্রকৌশলী (অঃ দাঃ)

২। সংস্থার নামঃ বাংলাদেশ পল্লী বিদ্যুতায়ন বোর্ড

৩। আবেদনকারীর ঠিকানাঃ প্রধান কার্যালয়, নিকুঞ্জ-২, খিলক্ষেত, ঢাকা-১২২৯।

৪। প্রকল্পের অবস্থানগত ঠিকানাঃ রাজশাহী-রংপুর বিভাগের জেলা সমূহ

৫। প্রকল্পের তফসিলঃ

জেলার নাম	থানা/উপজেলার নাম
বগুড়া	বগুড়া সদর, কাহালু, শিবগঞ্জ, গাবতলি, সোনাতলা, ধুনট, আদমদিঘী, দুপচাঁচিয়া, নন্দীগ্রাম, শাজাহানপুর, সারিয়াকান্দি, শেরপুর

৬। কারখানা/প্রকল্পের উৎপাদিত/উৎপাদিতব্য পন্যের নামঃ বিদ্যুৎ বিতরণ

উপরোক্ত তথ্যাদির আলোকে ''রাজশাহী-রংপুর বিভাগের অন্তর্গত একুশটি পল্লী বিদ্যুৎ সমিতির আধুনিকায়ন এবং সক্ষমতা বৃদ্ধি '' শীর্ষক উন্নয়ন প্রকল্পকে নিম্নবর্ণিত শর্ত সাপেক্ষে অনাপত্তি পত্র প্রদান করা হলো।

শর্তাবলীঃ

১। প্রকল্প স্থাপন ও পরিচালনার ক্ষেত্রে পরিবেশ সংরক্ষণ আইন ও বিধি যথাযথভাবে অনসরণ করতে হবে।

২। পরিবশ অধিদপ্তর হতে বিধি দ্বারা নির্ধারিত পদ্ধতিতে ছাড়পত্র গ্রহণ করতে হবে।

৩। কর্মরত শ্রমিকদের পেশাগত স্বাস্থ্য ও নিরাপত্তা নিশ্চিত করতে হবে।

৪। উপযুক্ত অগ্নি নির্বাপক ব্যবস্থা রাখতে হবে এবং অগ্নিকান্ড কিংবা অন্য কোন দুর্ঘটনার সময় জরুরী নির্গমন ব্যবস্থা থাকতে হবে।

৫। বায়ু ও শব্দ দূষণ করা যাবে না।

৬। প্রকল্প সৃষ্ট তরল বর্জ্য অপরিশোধিত অবস্থায় বাইরে নির্গমন করা যাবে না।

উল্লিখিত যে কোনো শর্ত লঙ্ঘন করলে যথোপযুক্ত কর্তৃপক্ষ কর্তৃক প্রকল্পের বিরুদ্ধে আইনানুগ ব্যবস্থা নেওয়া যাবে।

১১-৪-২০২১
মোঃ জিয়াউল হক
জেলা প্রশাসক
ফোন: ০৫১-৬৯১১০
ইমেইল: dcbogura@mopa.gov.bd

মোঃ শহিদুল ইসলাম, তত্ত্বাবধায়ক প্রকৌশলী (অঃ দাঃ),
পরিবেশ ও সামাজিক ব্যবস্থাপনা দপ্তর, রাজশাহী, রংপুর
বিভাগের অন্তর্গত একুশটি পল্লী বিদ্যুৎ সমিতির
আধুনিকায়ন এবং সক্ষমতা বৃদ্ধি প্রকল্প, বাংলাদেশ পল্লী

১

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
জেলা প্রশাসকের কার্যালয়, নওগাঁ।
(এলএ শাখা)
www.naogaon.gov.bd

স্মারক নং- ৩১.৪৩.৬৪০০.১০৭.০৫.০০১.২১- ২৯১

তারিখ: ৭ আষাঢ় ১৪২৮ / ২১ জুন ২০২১ ।

পরিবেশগত ছাড়পত্রের জন্য স্থানীয় কর্তৃপক্ষ কর্তৃক প্রদেয় অনাপত্তি প্রদান

১। আবেদনকারীর নামঃ মোঃ শহিদুল ইসলাম, তত্ত্বাবধায়ক প্রকৌশলী (অঃদাঃ)
২। সংস্থার নামঃ বাংলাদেশ পল্লী বিদ্যুয়তায়ন বোর্ড
৩। আবেদনকারীর ঠিকানাঃ প্রধান কার্যালয়, নিকুঞ্জ-২ খিলক্ষেত, ঢাকা-১২২৯
৪। প্রকল্পের অবস্থানগত ঠিকানাঃ রাজশাহী-রংপুর বিভাগের জেলা সমূহ
৫। প্রকল্পের তফসিলঃ

জেলার নাম	উপজেলার নাম
নওগাঁ	নওগাঁ সদর , আত্রাই, বদলগাছি, মান্দা, রাণীনগর, নিয়ামতপুর, ধামইরহাট, পত্নীতলা, সাপাহার, পোরশা, মহাদেবপুর

৬। কারখানা/প্রকল্পের উৎপাদিত/উৎপাদিতব্য পন্যের নামঃ বিদ্যুৎ বিতরণ

উপর্যুক্ত তথ্যাদির আলোকে "রাজশাহী, রংপুর বিভাগের অন্তর্গত একুশটি পল্লী বিদ্যুৎ সমিতির আধুনিকায়ন এবং সক্ষমতা বৃদ্ধি" শীর্ষক উন্নয়ন প্রকল্পকে নিম্নবর্ণিত শর্তসাপেক্ষে অন্যাপত্তিপত্র প্রদান করা হল।

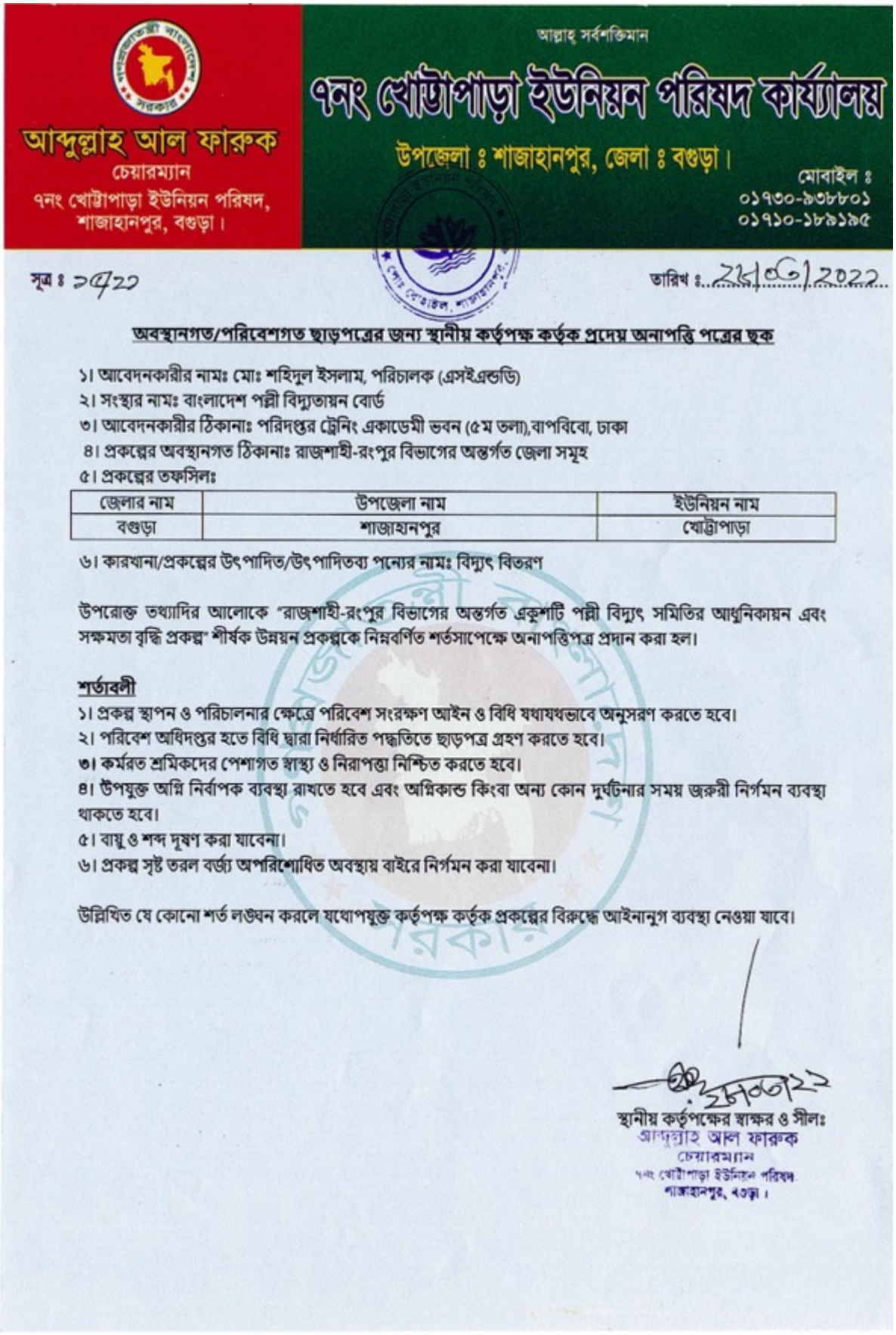
শর্তাবলী

১। প্রকল্প স্থাপন ও পরিচালনার ক্ষেত্রে পরিবেশ সংরক্ষণ আইন ও বিধি যথাযথভাবে অনুসরণ করেতে হবে।
২। পরিবেশ অধিদপ্তর হতে বিধি দ্বারা নির্ধারিত পদ্ধতিতে ছাড়পত্র গ্রহণ করতে হবে।
৩। কর্মরত শ্রমিকদের পেশাগত স্বাস্থ্য ও নিরাপত্তা নিশ্চিত করতে হবে।
৪। উপযুক্ত অগ্নি নির্বাপক ব্যবস্থা রাখতে হবে এবং অগ্নিকান্ড কিংবা অন্য কোন দুর্ঘটনার সময় জরুরী নির্গমন ব্যবস্থা থাকতে হবে।
৫। বায়ু ও শব্দ দূষণ করা যাবেনা।
৬। প্রকল্পে সৃষ্ট তরল বর্জ অপরিশোধিত অবস্থায় বাইরে নির্গমন করা যাবেনা।

উল্লিখিত যে কোনো শর্ত লঙ্ঘন করলে যথোপযুক্ত কর্তৃপক্ষ কর্তৃক প্রকল্পের বিরুদ্ধে আইনানুগ ব্যবস্থা নেওয়া যাবে।

২১/৬/২১
(মোঃ হারুন-অর-রশীদ)
জেলা প্রশাসক
নওগাঁ।
ফোন:-০৭৪১-৬২৫২৩ (দপ্তর)
ই-মেইল: dcnaogaon@mopa.gov.bd

তত্ত্বাবধায়ক প্রকৌশলী (অঃদাঃ)
পরিবেশ ও সামাজিক ব্যবস্থাপনা দপ্তর
"রাজশাহী, রংপুর বিভাগের অন্তর্গত একুশটি পল্লী বিদ্যুৎ
সমিতির আধুনিকায়ন এবং সক্ষমতা বৃদ্ধি" শীর্ষক উন্নয়ন প্রকল্প।
বাংলাদেশ পল্লী বিদ্যুতায়ন রোর্ড, প্রধান কার্যালয়, নিকুঞ্জ-২
খিলক্ষেত, ঢাক-১২২৯



আল্লাহ্ সর্বশক্তিমান

৭নং খোট্টাপাড়া ইউনিয়ন পরিষদ কার্য্যালয়

উপজেলা ঃ শাজাহানপুর, জেলা ঃ বগুড়া।

আব্দুল্লাহ আল ফারুক
চেয়ারম্যান
৭নং খোট্টাপাড়া ইউনিয়ন পরিষদ,
শাজাহানপুর, বগুড়া।

মোবাইল ঃ
০১৭৩০-৯৩৮৮০১
০১৭১০-১৮৯১৯৫

সূত্র ঃ ১৭২২

তারিখ ঃ ২৪/০৬/2022

অবস্থানগত/পরিবেশগত ছাড়পত্রের জন্য স্থানীয় কর্তৃপক্ষ কর্তৃক প্রদেয় অনাপত্তি পত্রের ছক

১। আবেদনকারীর নামঃ মোঃ শহিদুল ইসলাম, পরিচালক (এসইএন্ডডি)
২। সংস্থার নামঃ বাংলাদেশ পল্লী বিদ্যুতায়ন বোর্ড
৩। আবেদনকারীর ঠিকানাঃ পরিদপ্তর ট্রেনিং একাডেমী ভবন (৫ম তলা),বাপবিবো, ঢাকা
৪। প্রকল্পের অবস্থানগত ঠিকানাঃ রাজশাহী-রংপুর বিভাগের অন্তর্গত জেলা সমূহ
৫। প্রকল্পের তফসিলঃ

জেলার নাম	উপজেলা নাম	ইউনিয়ন নাম
বগুড়া	শাজাহানপুর	খোট্টাপাড়া

৬। কারখানা/প্রকল্পের উৎপাদিত/উৎপাদিতব্য পন্যের নামঃ বিদ্যুৎ বিতরণ

উপরোক্ত তথ্যাদির আলোকে "রাজশাহী-রংপুর বিভাগের অন্তর্গত একুশটি পল্লী বিদ্যুৎ সমিতির আধুনিকায়ন এবং সক্ষমতা বৃদ্ধি প্রকল্প" শীর্ষক উন্নয়ন প্রকল্পকে নিম্নবর্ণিত শর্তসাপেক্ষে অনাপত্তিপত্র প্রদান করা হল।

শর্তাবলী

১। প্রকল্প স্থাপন ও পরিচালনার ক্ষেত্রে পরিবেশ সংরক্ষণ আইন ও বিধি যথাযথভাবে অনুসরণ করতে হবে।
২। পরিবেশ অধিদপ্তর হতে বিধি দ্বারা নির্ধারিত পদ্ধতিতে ছাড়পত্র গ্রহণ করতে হবে।
৩। কর্মরত শ্রমিকদের পেশাগত স্বাস্থ্য ও নিরাপত্তা নিশ্চিত করতে হবে।
৪। উপযুক্ত অগ্নি নির্বাপক ব্যবস্থা রাখতে হবে এবং অগ্নিকান্ড কিংবা অন্য কোন দুর্ঘটনার সময় জরুরী নির্গমন ব্যবস্থা থাকতে হবে।
৫। বায়ু ও শব্দ দূষণ করা যাবেনা।
৬। প্রকল্প সৃষ্ট তরল বর্জ্য অপরিশোধিত অবস্থায় বাইরে নির্গমন করা যাবেনা।

উল্লিখিত যে কোনো শর্ত লঙ্ঘন করলে যথোপযুক্ত কর্তৃপক্ষ কর্তৃক প্রকল্পের বিরুদ্ধে আইনানুগ ব্যবস্থা নেওয়া যাবে।

২৪/০৬/২২

স্থানীয় কর্তৃপক্ষের স্বাক্ষর ও সীলঃ
আব্দুল্লাহ আল ফারুক
চেয়ারম্যান
৭নং খোট্টাপাড়া ইউনিয়ন পরিষদ
শাজাহানপুর, বগুড়া।

ইউনিয়ন পরিষদ কার্যালয়
১০নং রানীপুকুর ইউনিয়ন পরিষদ
ডাকঘরঃ বোর্তহাট,উপজেলাঃ বিরল,জেলাঃ দিনাজপুর

স্মারক নং-ইউপিরানী/বিরল, দিনাজ/২০২১/ তারিখঃ-০১-০৪-২০২১ইং

অবস্থানগত/পরিবেশগত ছাড়পত্রের জন্য স্থানীয় কর্তৃপক্ষ কর্তৃক প্রদেয় অনাপত্তি পত্রের ছক

১। আবেদনকারীর নামঃ মোঃ শহিদুল ইসলাম, তত্ত্বাবধায়ক প্রকৌশলী (অ: দা:)
২। সংস্থার নামঃ বাংলাদেশ পল্লী বিদ্যুতায়ন বোর্ড
৩। আবেদনকারীর ঠিকানাঃ প্রধান কার্যালয় নিকুঞ্জ-২, খিলক্ষেত, ঢাকা-১২২৯,
৪। প্রকল্পের অবস্থানগত ঠিকানাঃ রাজশাহী-রংপুর বিভাগের অন্তর্গত জেলাস মূহ
৫। প্রকল্পের তফসিলঃ

জেলার নাম	উপজেলার নাম	ইউনিয়নের নাম
দিনাজপুর	বিরল	১০নং রানীপুকুর

৬। কারখানা/প্রকল্পের উৎপাদিত/ উৎপাদিতব্য পন্যের নামঃ বিদ্যুৎ বিতরণ

উপরোক্ত তথ্যাদির আলোকে "রাজশাহী-রংপুর বিভাগের অন্তর্গত একুশটি পল্লীবিদ্যুৎ সমিতির আধুনিকায়ন এবং সক্ষমতা বৃদ্ধি প্রকল্প" শীর্ষক উন্নয়ন প্রকল্পকে নিম্নবর্ণিত শর্তসাপেক্ষে অনাপত্তিপত্র প্রদান করা হল।

শর্তাবলী

১।প্রকল্প স্থাপন ও পরিচালনার ক্ষেত্রে পরিবেশ সংরক্ষণ আইন ও বিধি যথাযথভাবে অনুসরণ করতে হবে।
২। পরিবেশ অধিদপ্তর হতে বিধি দ্বারা নির্ধারিত পদ্ধতিতে ছাড়পত্র গ্রহণ করতে হবে।
৩। কর্মরত শ্রমিকদের পেশাগত স্বাস্থ্য ও নিরাপত্তা নিশ্চিত করতে হবে।
৪। উপযুক্ত অগ্নি নির্বাপক ব্যবস্থা রাখতে হবে এবং অগ্নিকান্ড কিংবা অন্য কোন দুর্ঘটনার সময় জরুরী নির্গমন ব্যবস্থা থাকতে হবে।
৫। বায়ু ও শব্দ দূষণ করা যাবে না।
৬। প্রকল্প সৃষ্ট তরল বর্জ্য অপরিশোধিত অবস্থায় বাইরে নির্গমন করা যাবে না।

উল্লিখিত যে কোনো শর্ত লঙ্ঘন করলে যথো পযুক্ত কর্তৃপক্ষ কর্তৃক প্রকল্পের বিরুদ্ধে আইনানুগ ব্যবস্থা নেওয়া যাবে।

২-৪-২০২১
স্থানীয় কর্তৃপক্ষের স্বাক্ষর ও সীলঃ
(মোঃ ফারুক আযম)
চেয়ারম্যান
১০নং রানীপুকুর ইউ,পি
বিরল, দিনাজপুর।
মোঃ ফারুক আযম
চেয়ারম্যান
১০নং রানীপুকুর ইউ,পি
বিরল, দিনাজপুর।

গণপ্রজাতন্ত্রী বাংলাদেশ

৩নং কুর্শা ইউনিয়ন পরিষদ

উপজেলা ঃ কাউনিয়া, জেলা ঃ রংপুর।

ইমেইল ঃ kurshaup.kau.rang@gmail.com

শেখ হাসিনার মূলনীতি
গ্রাম শহরের উন্নতি

স্মারক নং - কুর্শা/ইউপি-৩/কাউ/রং/২১-৬৬২ তারিখ ঃ ২৯/০৩/২০২১খ্রিঃ।

অবস্থানগত/পরিবেশগত ছাড়পত্রের জন্য স্থানীয় কর্তৃপক্ষ কর্তৃক প্রদেয়
অনাপত্তি পত্রের ছক

১। আবেদনকারীর নামঃ মোঃ শহিদুল ইসলাম, পরিচালক (এসইএন্ডডি)
২। সংস্থার নামঃ বাংলাদেশ পল্লী বিদ্যুতায়ন বোর্ড
৩। আবেদনকারীর ঠিকানাঃ পরিদপ্তর ট্রেনিং একাডেমী ভবন (৫ম তলা),বাপবিবো, ঢাকা
৪। প্রকল্পের অবস্থানগত ঠিকানাঃ রাজশাহী-রংপুর বিভাগের অন্তর্গত জেলা সমূহ
৫। প্রকল্পের তফসিলঃ

জেলার নাম	উপজেলা নাম	ইউনিয়ন নাম
রংপুর	কাউনিয়া	৩নং কুর্শা

৬। কারখানা/প্রকল্পের উৎপাদিত/উৎপাদিতব্য পন্যের নামঃ বিদ্যুৎ বিতরণ

উপরোক্ত তথ্যাদির আলোকে "রাজশাহী-রংপুর বিভাগের অন্তর্গত একুশটি পল্লী বিদ্যুৎ সমিতির আধুনিকায়ন এবং সক্ষমতা বৃদ্ধি প্রকল্প" শীর্ষক উন্নয়ন প্রকল্পকে নিম্নবর্ণিত শর্তসাপেক্ষে অনাপত্তিপত্র প্রদান করা হল।

শর্তাবলী

১। প্রকল্প স্থাপন ও পরিচালনার ক্ষেত্রে পরিবেশ সংরক্ষণ আইন ও বিধি যথাযথভাবে অনুসরণ করতে হবে।
২। পরিবেশ অধিদপ্তর হতে বিধি দ্বারা নির্ধারিত পদ্ধতিতে ছাড়পত্র গ্রহণ করতে হবে।
৩। কর্মরত শ্রমিকদের পেশাগত স্বাস্থ্য ও নিরাপত্তা নিশ্চিত করতে হবে।
৪। উপযুক্ত অগ্নি নির্বাপক ব্যবস্থা রাখতে হবে এবং অগ্নিকান্ড কিংবা অন্য কোন দুর্ঘটনার সময় জরুরী নির্গমন ব্যবস্থা থাকতে হবে।
৫। বায়ু ও শব্দ দূষণ করা যাবেনা।
৬। প্রকল্প সৃষ্ট তরল বর্জ্য অপরিশোধিত অবস্থায় বাইরে নির্গমন করা যাবেনা।

উল্লিখিত যে কোনো শর্ত লঙ্ঘন করলে যথোপযুক্ত কর্তৃপক্ষ কর্তৃক প্রকল্পের বিরুদ্ধে আইনানুগ ব্যবস্থা নেওয়া যাবে।

২৯/৩/২০২১

(মোহাম্মদ হোসেন সরকার)
চেয়ারম্যান
৩নং কুর্শা ইউনিয়ন পরিষদ
কাউনিয়া, রংপুর।
মোবাঃ ০১৭৩৬৬৮৬৮৭৪

মোহাম্মদ হোসেন সরকার
চেয়ারম্যান
৩নং কুর্শা ইউনিয়ন পরিষদ
কাউনিয়া, রংপুর।

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার

চেয়ারম্যানের কার্যালয়

১০নং জাবরহাট ইউনিয়ন পরিষদ

উপজেলা: পীরগঞ্জ, জেলা: ঠাকুরগাঁও।

www.jabarhatup.thakurgaon.gov.bd

স্মারক নং:

তারিখ:

অবস্থানগত/পরিবেশগত ছাড়পত্রের জন্য স্থানীয় কর্তৃপক্ষ কর্তৃক প্রদেয় অনাপত্তি পত্রের ছক

১। আবেদনকারীর নাম: মো: শহিদুল ইসলাম, তত্ত্বাবধায়ক প্রকৌশলী (অ: দা:)

২। সংস্থার নাম: বাংলাদেশ পল্লী বিদ্যুতায়ন বোর্ড

৩। আবেদনকারীর ঠিকানা: প্রধান কার্যালয় নিকুঞ্জ-২, খিলক্ষেত, ঢাকা-১২২৯,

৪। প্রকল্পের অবস্থানগত ঠিকানা: রাজশাহী-রংপুর বিভাগের অন্তর্গত জেলা সমূহ

৫। প্রকল্পের তফসিল:

জেলার নাম	উপজেলা নাম	ইউনিয়নের নাম
ঠাকুরগাঁও	পীরগঞ্জ	১০ নং জাবরহাট

৬। কারখানা/প্রকল্পের উৎপাদিত/উৎপাদিতব্য পন্যের নাম: বিদ্যুৎ বিতরণ

উপরোক্ত তথ্যাদির আলোকে "রাজশাহী-রংপুর বিভাগের অন্তর্গত একুশটি পল্লী বিদ্যুৎ সমিতির আধুনিকায়ন এবং সক্ষমতা বৃদ্ধি প্রকল্প" শীর্ষক উন্নয়ন প্রকল্পকে নিম্নবর্ণিত শর্তসাপেক্ষে অনাপত্তিপত্র প্রদান করা হল।

শর্তাবলী

১। প্রকল্প স্থাপন ও পরিচালনার ক্ষেত্রে পরিবেশ সংরক্ষণ আইন ও বিধি যথাযথভাবে অনুসরণ করতে হবে।

২। পরিবেশ অধিদপ্তর হতে বিধি দ্বারা নির্ধারিত পদ্ধতিতে ছাড়পত্র গ্রহণ করতে হবে।

৩। কর্মরত শ্রমিকদের পেশাগত স্বাস্থ্য ও নিরাপত্তা নিশ্চিত করতে হবে।

৪। উপযুক্ত অগ্নি নির্বাপক ব্যবস্থা রাখতে হবে এবং অগ্নিকান্ড কিংবা অন্য কোন দুর্ঘটনার সময় জরুরী নির্গমন ব্যবস্থা থাকতে হবে।

৫। বায়ু ও শব্দ দূষণ করা যাবেনা।

৬। প্রকল্প সৃষ্ট তরল বর্জ্য অপরিশোধিত অবস্থায় বাইরে নির্গমন করা যাবেনা।

উল্লিখিত যে কোনো শর্ত লঙ্ঘন করলে যথোপযুক্ত কর্তৃপক্ষ কর্তৃক প্রকল্পের বিরুদ্ধে আইনানুগ ব্যবস্থা নেওয়া যাবে।

স্থানীয় কর্তৃপক্ষের স্বাক্ষর ও সীলঃ

নির্মল চন্দ্র রায়
প্যানেল চেয়ারম্যান-১
১০নং জাবরহাট ইউ,পি
পীরগঞ্জ, ঠাকুরগাঁও।

Appendix 12: Gender Analysis Checklist

1.	Approaches gender issues from a human rights perspective (**gender and human rights**);
2.	Acknowledges and seeks to redress inequalities between men and women, boys and girls; explicitly promotes equality between men and women, boys and girls (**gender in/equality**);
3.	Provides and analyzes sex-disaggregated data as part of the background/justification for the project's existence and design; includes sex-disaggregated indicators for project monitoring purposes (including data on gender participation in planning, implementation and monitoring and evaluation (**gender data**);
4.	Evaluates situations where gender-based violence (GBV) may be more likely to occur and proposes methods to prevent GBV in affected households, communities and among project workers (**gender-based violence**);
5.	Analyzes gender relations, dynamics and inequalities within relevant political, legal, geographic, economic, historical and/or social contexts to be considered throughout the project cycle (**gender in context**);
6.	Examines how gender inequalities uniquely affect men and women/boys' and girls' abilities to participate in the project cycle and benefit from project outputs and outcomes, including whether user fees and other harmful conditions promoted through the project may differentially affect access to services for men and women, boys and girls (**gender access**);
7.	Identifies and seeks to value men's and women's differential unpaid time devoted to traditionally feminine care work, including cooking, cleaning, child care, and water and fuel collection (**gender and care work**);
8.	Promotes the equal opportunity for those who are directly or indirectly affected by the project to participate throughout the project cycle—from planning to implementation to monitoring and evaluation—including women, marginalized men, and other vulnerable groups, as appropriate; collect data on participation by gender (**gender inputs**);
9.	Plans project outputs and outcomes that accommodate and respond to the differential needs of men and women, boys and girls (**gender outputs**); and
10.	Considers the differential longer-term impacts of projects and/or IFI-endorsed policies on women and men, boys and girls (**gender impact**).

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Appendix 13: Asbestos-Containing Material Management Plan (ACMMP)

1. Introduction

This Asbestos-Containing Material Management Plan (ACMMP) has been developed for the proposed modernization and capacity enhancement project in Rajshahi-Rangpur division. The purpose of this plan is to ensure the safe and effective management of asbestos-containing materials (ACMs) that may be present during the project, protecting the health of workers, communities, and the environment.

2. Scope of Work

The scope of this ACMMP includes:

- Identifying and locating potential ACMs within the project area, including existing structures, infrastructure, and materials transported for construction.
- Assessing the condition and risk of identified ACMs.
- Developing a plan for the safe handling, removal, and disposal of ACMs, minimizing disturbance and fiber release.
- Implementing the ACMMP during all construction and maintenance activities.
- Monitoring and documenting ACMMP activities.

3. Regulatory Requirements

The following Bangladeshi regulations and guidelines apply to the management of ACMs:

- The Environment Protection Act, 1995
- The Bangladesh National Building Code (BNBC)
- The Department of Environment (DoE) Guidelines for Asbestos Management

4. Roles and Responsibilities

The following roles and responsibilities are defined for the implementation of this ACMMP:

- Project Manager: Overall responsibility for the implementation of the ACMMP.
- Contractor: Responsible for implementing the ACMMP during construction activities.
- Site Supervisors: Ensure work follows ACMMP procedures and oversee worker safety.
- Workers: Trained in safe work practices for handling ACMs and wear appropriate PPE.

5. ACM Identification and Assessment

- Prior to project: Desktop research and analysis of historical building materials and infrastructure records to identify potential ACM presence.
- Field Survey: A qualified asbestos consultant will conduct a visual inspection of all project areas, including existing buildings, electrical poles, wires, and any imported materials. Sampling and analysis of suspected ACMs will be conducted if necessary.
- Risk Assessment: Based on the findings of the identification and assessment, the consultant will establish a risk classification for each ACM based on its condition, friability, and potential for disturbance.

6. ACM Management Plan

Based on the identified ACMs and risk assessment, a detailed ACM management plan will be developed specific to the project:

- Work Scope: Define the extent of ACM removal, encapsulation, or isolation needed based on risk and cost considerations.

- Safe Work Practices: Outline specific procedures for ACM handling, including demolition, removal, transportation, and disposal, according to DoE guidelines and BNBC requirements.
- Decontamination Procedures: Establish protocols for decontaminating equipment, work areas, and potentially exposed personnel.
- Waste Disposal Procedures: Specify authorized disposal facilities for ACM waste, ensuring compliance with environmental regulations.
- Emergency Response Procedures: Define protocols for accidental ACM release, including containment, notification, and evacuation.

7. Training

All personnel involved in the project, including supervisors, workers, and relevant community members, will receive training on:

- Identifying ACMs and recognizing potential risks.
- Health risks associated with asbestos exposure.
- Safe work practices for handling ACMs according to the plan.
- Personal protective equipment (PPE) requirements and proper use.
- Emergency response procedures for accidental ACM release.

8. Implementation

- All work with ACMs will be conducted only by qualified and authorized personnel under the supervision of the asbestos consultant.
- Work permits will be issued for each ACM activity, specifying required procedures and PPE.
- Continuous monitoring of dust levels and air quality will be conducted during ACM handling to ensure worker safety and regulatory compliance.
- Decontamination procedures will be strictly followed after each ACM activity.
- Proper disposal of ACM waste will be documented with authorized disposal certificates.
- Emergency response procedures will be readily available and practiced with local authorities.

9. Monitoring and Documentation

- The project manager and Environmental consultant will monitor the implementation of the ACMMP regularly.
- All ACMMP activities, including permits, monitoring results, waste disposal records, and training logs, will be documented and maintained for future reference and regulatory compliance.

10. Review and Revision

This ACMMP will be reviewed and revised as necessary throughout the project, especially if new information about ACMs is discovered or the project scope changes. Regular consultations with the asbestos consultant and relevant authorities will be conducted.

11. Community Engagement

- Local communities potentially affected by project activities involving ACMs will be informed about the presence and management of ACMs in a clear and understandable manner.
- Communication channels will be established to address community concerns and provide updates on ACMMP implementation.

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12. Conclusion

This ACMMP is an important document that outlines the safe and effective management of ACMs during the project implementation . By following the procedures outlined in this plan, we can protect the health and safety of workers and the public from the risks of asbestos exposure.

Appendix 14: Safe Working Procedure by BREB

1. Safe Working Procedure

Each employee must accept responsibility for his own safety as well as safety to fellow- workers and the public. Safe operating conditions shall be maintained at all times. Poor "housekeeping" cannot be tolerated since it generally leads to accidents. The rules set forth in the BREB Safety Manual shall be observed.

2. Tools and Construction Equipment

All tools and construction equipment shall be kept in good working order. Tools or construction equipment found to be broken or damaged shall be reported immediately and replaced or repaired to good working condition before they are again used. Workmen's climbing tools and equipment that will be issued to individuals must be maintained in good condition. An office order shall be issued for distribution of tools for individuals. The person to whom the equipment or tool is assigned shall be responsible for proper care of such tools or equipment. Damaged or broken tools and construction equipment can cause serious accidents. These accidents can be prevented by a "common sense" approach to safety in using tools and construction equipment. Tools and construction equipment shall be used only for the function for which they were designed. Do not use tools or equipment those are unfamiliar. Before using an unfamiliar tools one must know how to use the tools or equipment. PBS must retain adequate tools and equipment for operation and maintenance of its Electrical Distribution System. The functionality and capacity of each tool and equipment must be checked before

3. PERSONAL SAFETY

Working in the vicinity of electric facilities can be performed safely if good judgement is used. Linemen, when properly trained, can work safely on a pole. Short cuts, however, cause accidents. No one's personal safety shall be jeopardized to allow for short cuts or unsafe acts. Personal protective equipment shall be used at all times, hard hats, gloves, safety belts, long sleeved shirts, long pants and safety glasses.

When line personnel are working above ground, special hazards are introduced, not only to the men on the pole, but also to the men working on the ground. Falling tools or other objects constitute such hazards. Hand lines shall be used for raising or lowering material from the pole. Do not throw material up (or down) the pole. Hard hats shall be worn when working in the area of activity.

4. TRANSPORTATION EQUIPMENT

Transportation equipment presents some special hazards when operated in congested areas or on rough roads or terrain. Every effort shall be made to keep the equipment properly maintained and in good working order. The person assigned to operate the equipment shall be responsible for its safe operation. Speeding, rough handling, or other abuse of equipment shall not be allowed. Any equipment defect shall be promptly reported and repaired. To operate mechanical vehicle/transport, license from BRTA (Bangladesh Road Transport Authority) must be obtained, when required and should be updated timely.Unsafe, improperly maintained equipment shall not be used on the PBS systems.

Appendix 15: Emergency Plan by BREB

5.0 EMERGENCY PROCEDURES

5.1 GENERAL

Emergencies may arise occasionally requiring quick action to prevent undue equipment damage, or to protect the public or employees. Careful prior thought and contingency planning must be given in regard to the actions to be taken in order to prevent excessive damage. Again, "Think then Switch"

5.2 EMERGENCY PLANS

Emergency plans for a substation depend on the type and magnitude of expected problems. The following considerations should be made before attempting to correct an emergency.

1. Stay calm. Maintain a positive attitude.
2. If the person designated to perform switching or other operating functions is not familiar with the substation, he/ she should review the substation single line diagram before performing emergency switching.
3. Perform the necessary switching to clear (de-energize) the distressed equipment.

The substation's emergency plans must be an integral part of the overall system emergency plan when system emergencies exist. (This topic will be further discussed. in the Distribution Operation Manual).

5.3 ABNORMAL SUBSTATION CONDITIONS

Substations may experience abnormal conditions at various times for various causes.

1. Violent failures, faults or excessive overload conditions: These cause an emergency condition in the substation. These conditions may cause severe damage to substation equipment. Depending upon the severity of the condition, the condition may warrant disconnecting the device(s) that are being overloaded or otherwise over-stressed until the condition that caused the problem can be corrected. Emergency switching procedures should be followed.
2. Moderate overload conditions: In case of moderate overload, where approximately normal voltage is maintained, indications of distress may be difficult to detect and an interruption of the power supply may not occur for an extended period of time or perhaps not at all. Careful observation of the meters in the substation and temperature indicators on equipment is recommended to ensure that the equipment is not being harmed by this overload condition. Normal or emergency switching procedures may be followed as determined necessary and appropriate.
3. Transmission line abnormal conditions: The existence of transmission line trouble such as broken or faulted conductors or insulators will be evident in the various substations. An

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operator may be able to obtain some idea of the kind of trouble affecting the substation voltages and/or currents and it may be necessary to disconnect equipment temporarily until the abnormal transmission line condition is corrected. Switching by either normal or emergency procedure should be followed as determined necessary from analysis of the transmission line trouble.

4. Bulletins on Emergency Procedures: From time to time BREB System Operations will issue Substation Emergency Procedure Bulletins. These bulletins will provide detailed actions to take for specific recurring emergencies that have been shared by various PBS's. These bulletins should be maintained in a readily accessible file of fastened loose-leaf pages and copies amended to this instruction as they are issued. Emergency Procedure bulletins are described in Sections 5.1, 5.2 & 5.3.

5.4 GUIDELINE TO ISOLATE AND RE-ENERGIZE THE SUBSTATION AFTER TRIPPING THE 33 KV INCOMING LINE

When there is complaint from the Power Supplier that the 33 KV line trips due to the presence of faults in the distribution system of PBS, the PBS Engineer should isolate and re-energize the sub-station according to the following procedure:

1. Immediately open: a) Isolator Switch No. 199 or ACR/ OCR/ Breaker No. 99
   b) Bus and Feeder ACR/ OCR/ Breakers
2. Request Power Supplier to 'SWITCH ON' the 33 KV line.
3. If the 33 KV line trips again, the fault is in the 33 KV line, then -
   a) Keep Isolator Switch No. 199 or ACR/ OCR/ Breaker No. 99 'OPEN'
   b) Request Power Supplier to remove the fault from the 33 KV line.
4. If the 33 KV line does not trip after its energization, there may be a fault in the PBS substation.
   a) Observe the readings of the pressure gauge, the winding temperature gauge, the oil temperature gauge and the oil level gauge attached to the power transformer body.
   b) Check for the presence of any visible external fault of the HT and LT bushings, lightning arrester vents, pressure relief device flag, oil from around the pressure relief device or grounds.
5. If any unusual condition is observed as mentioned above, immediately inform the System Operation Directorate.
6. If everything is 'NORMAL' as checked in step 4, then close Isolator Switch No. 199 or ACR/ OCR/ Breaker No. 99.
7. If the 33 KV line or ACR/ OCR/ Breaker No. 99 trips then -

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(Kazi Anam Mollik) Asst. Secy. (Board), BREB

a) Immediately open the Isolator Switch No. 199 or ACR/ OCR/ Breaker No. 99

b) Again request BPDB/ Power provider to switch 'on' the 33 KV line.

c) Perform the Insulation Resistance Test on the transformers and regulators Communicate to the BREB System Operation Directorate and zonal Superintending Engineer all the details about the Insulation Resistance Test result, the pressure gauge reading, temperature readings of transformer winding and transformer oil and evidence of oil on the top of the transformers or regulators.

8. If the power transformer operates normally after closing the Isolator Switch No. 199 or ACR/ OCR/ Breaker No. 99 then -

a) Close Isolator switch 166 if opened previously

9. If the ACR/ OCR/ Breaker does not trip, it means that the voltage regulators are okay. If ACR/ OCR/ Breaker No. 99 trips, then the voltage regulators, bus, arresters, or one of the feeder ACRs is most likely faulty.

a) Take the necessary steps to determine the faulty piece of equipment then remove it from service.

b) Set the good regulators to the 'NEUTRAL' position if possible. If there is no power to the station then it will not be possible to run the regulators to the neutral position until a separate power source is brought in. DO NOT BYPASS THE REGULATORS until they can be put to the neutral position or they can be re-energized with the switches in the normal in-service position.

c) Immediately inform the BREB System Operation Directorate and zonal Superintending Engineer of the problem giving all relative details.

10. If after closing the source ACR/ OCR/ Breaker 99, the system does not show any fault, then energize the 11 KV feeders one by one. Consider the 33 KV fault as temporary.

5.5.1 GUIDELINE TO RE-ENERGIZE THE SUBSTATION AFTER THE FAILURE OF A LIGHTNING ARRESTER

Before re-energizing a substation where either the 11KV LT or 33KV HT lightning arrester has failed, the following steps are to be strictly observed.

1. Determine the reasons of the lightning arrester failure and contact the BREB System Operation Directorate and zonal Superintending Engineer.

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(Kazmul Ahsan Akhand) Asst. Secy. (Board), BREB.

2. Check the HT and LT bushing connections, the grounding connections and all transformer gauges and pressure relief device.

3. Perform an insulation resistance test of the power transformers and lightning arresters.

4. If after thorough checking everything is found satisfactory, the damaged lightning arrester should be replaced.

5. Having changed the lightning arrester, obtain clearance from the System Operation Directorate to re-energize the substation.

*** NOTE - If an LT lightning arrester is not readily available, one 9 KV distribution lightning arresters may be installed as per Figure 5-1. Within a maximum of 7 (seven) days, the proper size station class lightning arrester must be installed.

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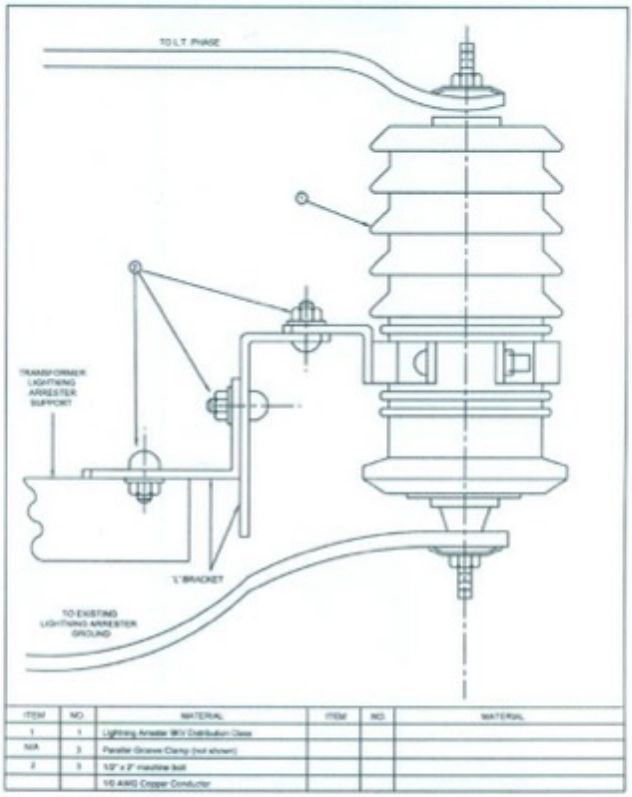

ITEM	NO.	MATERIAL	ITEM	NO.	MATERIAL
1	1	Lightning Arrester 9KV Distribution Class			
N/A	3	Parallel Groove Clamp (not shown)			
2	1	1/2" x 2" machine bolt			
		1/0 AWG Copper Conductor			

Figure 5-1

Emergency Lighting Arrester Substitution

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5.6 FAULT INDICATOR INSTRUCTIONS

5.6.1 General

Linam Type EHR automatic-reset fault indicators are magnetically tripped, electrostatically reset, and require no electrical connections. They are epoxy encapsulated and are completely waterproof and weatherproof. The trip level is factory calibrated and needs no further adjustment. The trip-current rating is printed on the indicator.

5.6.2 Operation

The trip circuit operates only when the line current exceeds the factory-set trip level of the indicator (within 10 percent). The indicator face shows all white in the un-tripped position; when tripped, the reflective red target rotates in view (Sub-figure 3 of Figure 5-3).

Resetting is automatically accomplished by the discharge of a capacitor through the reset coil. The capacitor is charged by the electrostatic voltage gradient between the line and a nearby ground plane. The indicator should be located near a ground plane to assure proper reset action. The indicator requires approximately a three-minute charging period after installation before it will operate correctly.

If current flow is interrupted (for example when an OCR opens due to a fault), the indicator target remains in the position it was in when current was interrupted. The target position cannot be mechanically changed due to a magnetic-balance principle.

Installation

1. Attach a shotgun-type switch stick to the indicator, using the installation eye on the indicator (Sub-figure 3 of Figure 5-3).
2. Position the indicator on the underside of the conductor (Sub-figure 1 of Figure 5-3).
3. Push the indicator onto the conductor with an upward - and slightly forward - motion. This causes the spring clamp to securely hold the cable against the indicator yoke(Sub-figure 2 of Figure 5-3).
4. Adjust the position of the indicator for maximum target visibility and remove the switch-stick (Figure 5-2).

5.6.3 Application

The automatic resetting fault indicators are to be used in substations where three-phase ACRs are the sectionalizing devices used for feeder protection. The use of the fault

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indicator will facilitate phase identification in the detection of single phase faults on the three phase feeders. The fault indicator should be placed on the horizontal bend or sweep of the load-side jumper between the ACR and load side disconnect switch (see Figure 5-2). This location will facilitate installation and reading of the indicator.

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(Kamrul Ahsan Moflik) Asst. Secy. (Board), BREB.

Figure 5-2: Location of fixing Fault Indicator

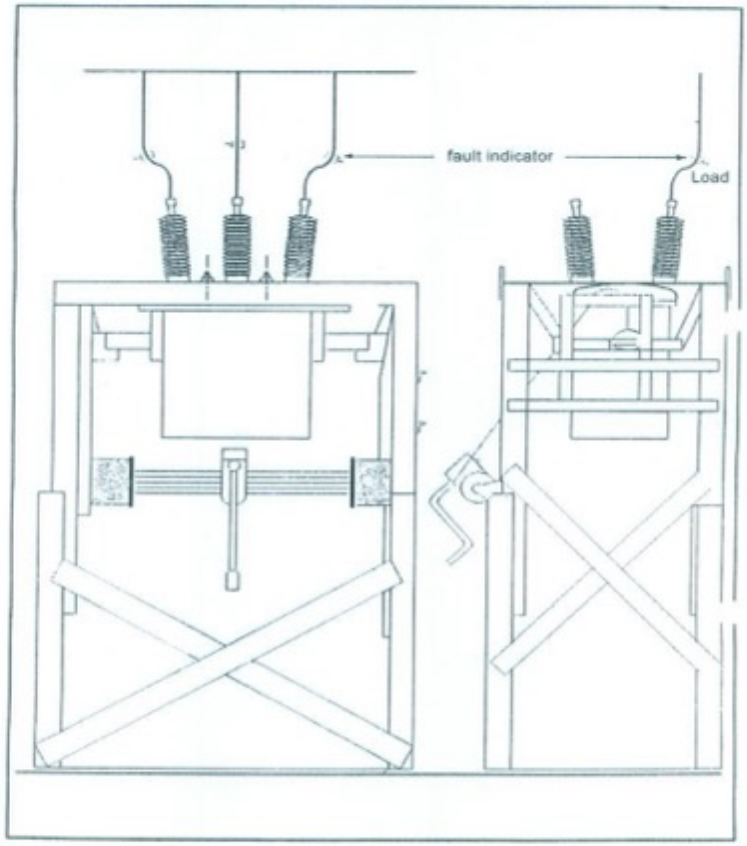

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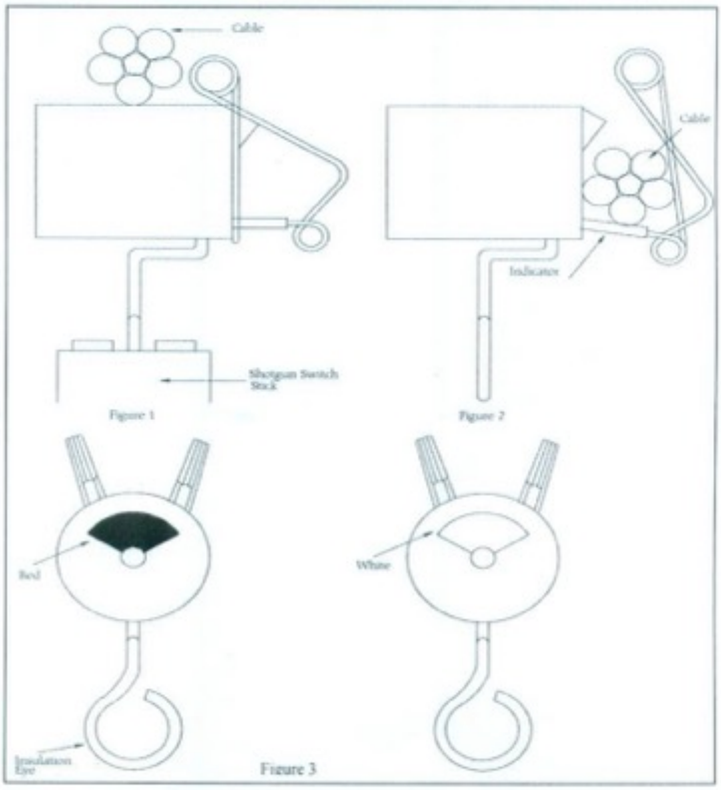
Figure 5-3: Fault Indicator Details



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Appendix 16: PCB Test Report

Sub Station to be Upgraded Under MCEP (Rajshahi-Rangpur) Project's

Power Transforemer Oil PCB Test Information Sheet

SL No	Name of PBS	Name of Sub Station	Serial No	Manufacturer	Rating (MVA)	Clor-N oil 50 Test results (PCB Test Result)
1	2	3	4	5	6	7
1	Rajshahi PBS	Durgapur-1	126	Energypac	5	PCB Free
		Godagari-1	905253	Bursh	10/14	PCB Free
2	Chapai PBS	Shibgonj-2	94942	Marson	10	PCB Free
		Gomastapur-1	5000-62	Energypac	5	PCB Free
3	Natore PBS-1	Puthia-2	0007	TV	10	PCB Free
		Puthia-1	0135	TV	1.667	PCB Free
4	Joypurhat PBS	Khetlal-1	0033	Confidance	10	PCB Free
5	Nagoan PBS-1	Manda-1	863067-8	Hico	1.667	PCB Free
6	Rangpur PBS-2	Rangpur-1	842251007	Electric com ltd	10/14	PCB Free
7	NatorePBS-2	Boraigram-3	10-12.5-21	Energypac	10	PCB Free
		Charghat-1	33	Energypac	1.667	PCB Free
8	Sirajgonj PBS-2	Sirajgonj -2	133	Energypac	5	PCB Free
9	Dinajpur PBS-2	Birampur-1	45	Energypac	3.33	PCB Free
10	Sirajgonj PBS-1	Ullapara-1	5000-88	Alpha	5	PCB Free
		Tarash-1	025	TS	5	PCB Free
11	Pabna PBS-1	Chatmohor-2	0194	TV	3.33	PCB Free

15/05/24
Md. Kamrul Hasan
Foreman (Tech)
System Operation Workshop
BREB, Rajshahi

15.05.2024

15/05/2024
(মোঃ জুলফিকার আলী)
নির্বাহী প্রকৌশলী
সিস্টেম অপারেশন ওয়ার্কশপ
বাপবিবো রাজশাহী।

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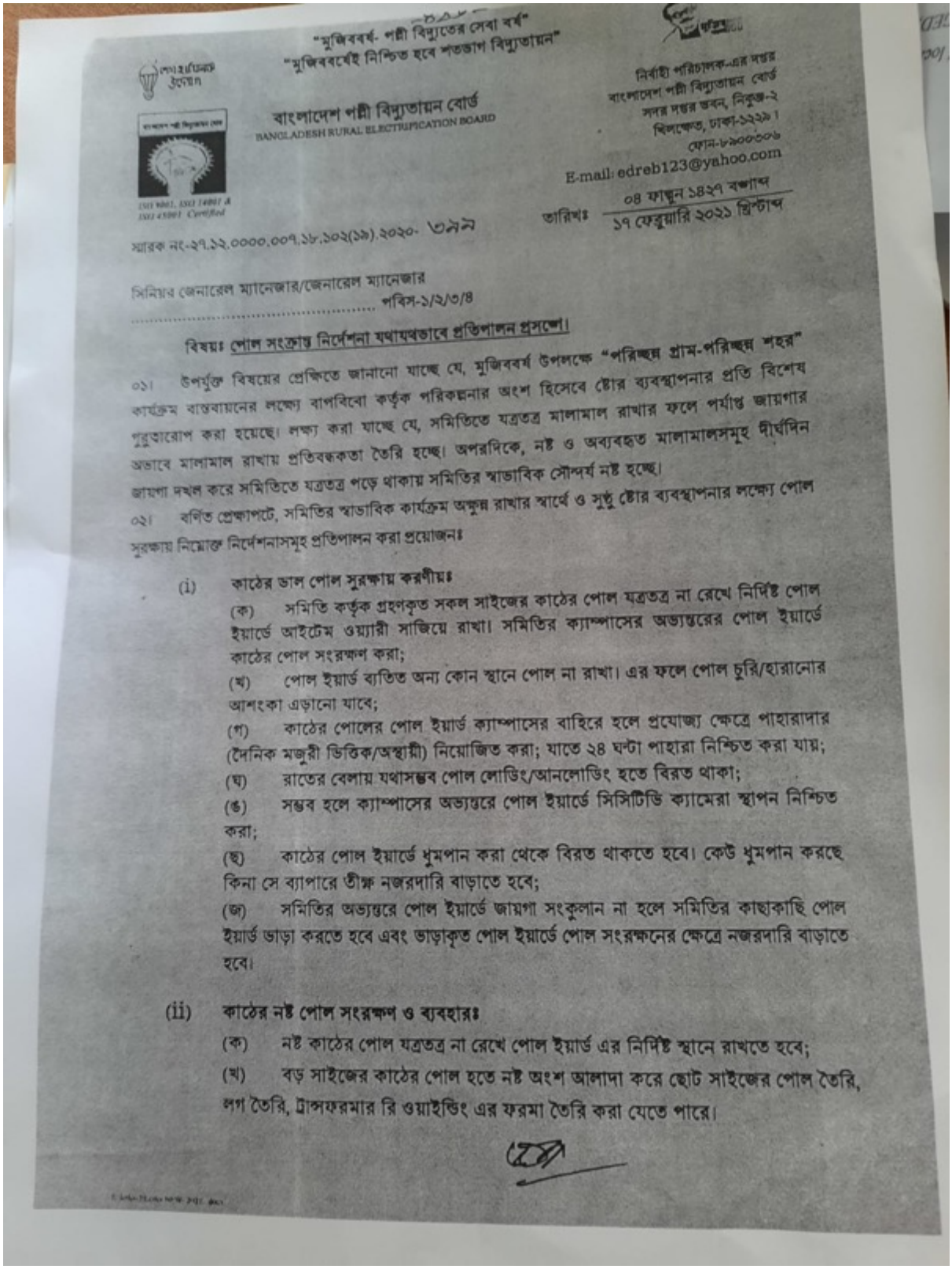
Appendix 17: Letter from BREB to PBSs official on Pole handling, storage & usage



"মুজিববর্ষ- পল্লী বিদ্যুতের সেবা বর্ষ"
"মুজিববর্ষেই নিশ্চিত হবে শতভাগ বিদ্যুতায়ন"

বাংলাদেশ পল্লী বিদ্যুতায়ন বোর্ড
BANGLADESH RURAL ELECTRIFICATION BOARD

নির্বাহী পরিচালক-এর দপ্তর
বাংলাদেশ পল্লী বিদ্যুতায়ন বোর্ড
সদর দপ্তর ভবন, নিকুঞ্জ-২
খিলক্ষেত, ঢাকা-১২২৯।
ফোন-৮৯০০৩০৬
E-mail: edreb123@yahoo.com

স্মারক নং-২৭.১২.০০০০.০০৭.১৮.১০২(১৯).২০২০- ৩৯৯

তারিখঃ ০৪ ফাল্গুন ১৪২৭ বঙ্গাব্দ
১৭ ফেব্রুয়ারি ২০২১ খ্রিস্টাব্দ

সিনিয়র জেনারেল ম্যানেজার/জেনারেল ম্যানেজার
..... পবিস-১/২/৩/৪

বিষয়ঃ পোল সংক্রান্ত নির্দেশনা যথাযথভাবে প্রতিপালন প্রসঙ্গে।

০১। উপর্যুক্ত বিষয়ের প্রেক্ষিতে জানানো যাচ্ছে যে, মুজিববর্ষ উপলক্ষে "পরিচ্ছন্ন গ্রাম-পরিচ্ছন্ন শহর" কার্যক্রম বাস্তবায়নের লক্ষ্যে বাপবিবো কর্তৃক পরিকল্পনার অংশ হিসেবে ষ্টোর ব্যবস্থাপনার প্রতি বিশেষ গুরুত্বারোপ করা হয়েছে। লক্ষ্য করা যাচ্ছে যে, সমিতিতে যত্রতত্র মালামাল রাখার ফলে পর্যাপ্ত জায়গার অভাবে মালামাল রাখায় প্রতিবন্ধকতা তৈরি হচ্ছে। অপরদিকে, নষ্ট ও অব্যবহৃত মালামালসমূহ দীর্ঘদিন জায়গা দখল করে সমিতিতে যত্রতত্র পড়ে থাকায় সমিতির স্বাভাবিক সৌন্দর্য নষ্ট হচ্ছে।

০২। বর্ণিত প্রেক্ষাপটে, সমিতির স্বাভাবিক কার্যক্রম অক্ষুন্ন রাখার স্বার্থে ও সুষ্ঠু ষ্টোর ব্যবস্থাপনার লক্ষ্যে পোল সুরক্ষায় নিম্নোক্ত নির্দেশনাসমূহ প্রতিপালন করা প্রয়োজনঃ

(i) **কাঠের ভাল পোল সুরক্ষায় করণীয়ঃ**

(ক) সমিতি কর্তৃক গ্রহণকৃত সকল সাইজের কাঠের পোল যত্রতত্র না রেখে নির্দিষ্ট পোল ইয়ার্ডে আইটেম ওয়্যারী সাজিয়ে রাখা। সমিতির ক্যাম্পাসের অভ্যন্তরের পোল ইয়ার্ডে কাঠের পোল সংরক্ষণ করা;

(খ) পোল ইয়ার্ড ব্যতিত অন্য কোন স্থানে পোল না রাখা। এর ফলে পোল চুরি/হারানোর আশংকা এড়ানো যাবে;

(গ) কাঠের পোলের পোল ইয়ার্ড ক্যাম্পাসের বাহিরে হলে প্রযোজ্য ক্ষেত্রে পাহারাদার (দৈনিক মজুরী ভিত্তিক/অস্থায়ী) নিয়োজিত করা; যাতে ২৪ ঘন্টা পাহারা নিশ্চিত করা যায়;

(ঘ) রাতের বেলায় যথাসম্ভব পোল লোডিং/আনলোডিং হতে বিরত থাকা;

(ঙ) সম্ভব হলে ক্যাম্পাসের অভ্যন্তরে পোল ইয়ার্ডে সিসিটিভি ক্যামেরা স্থাপন নিশ্চিত করা;

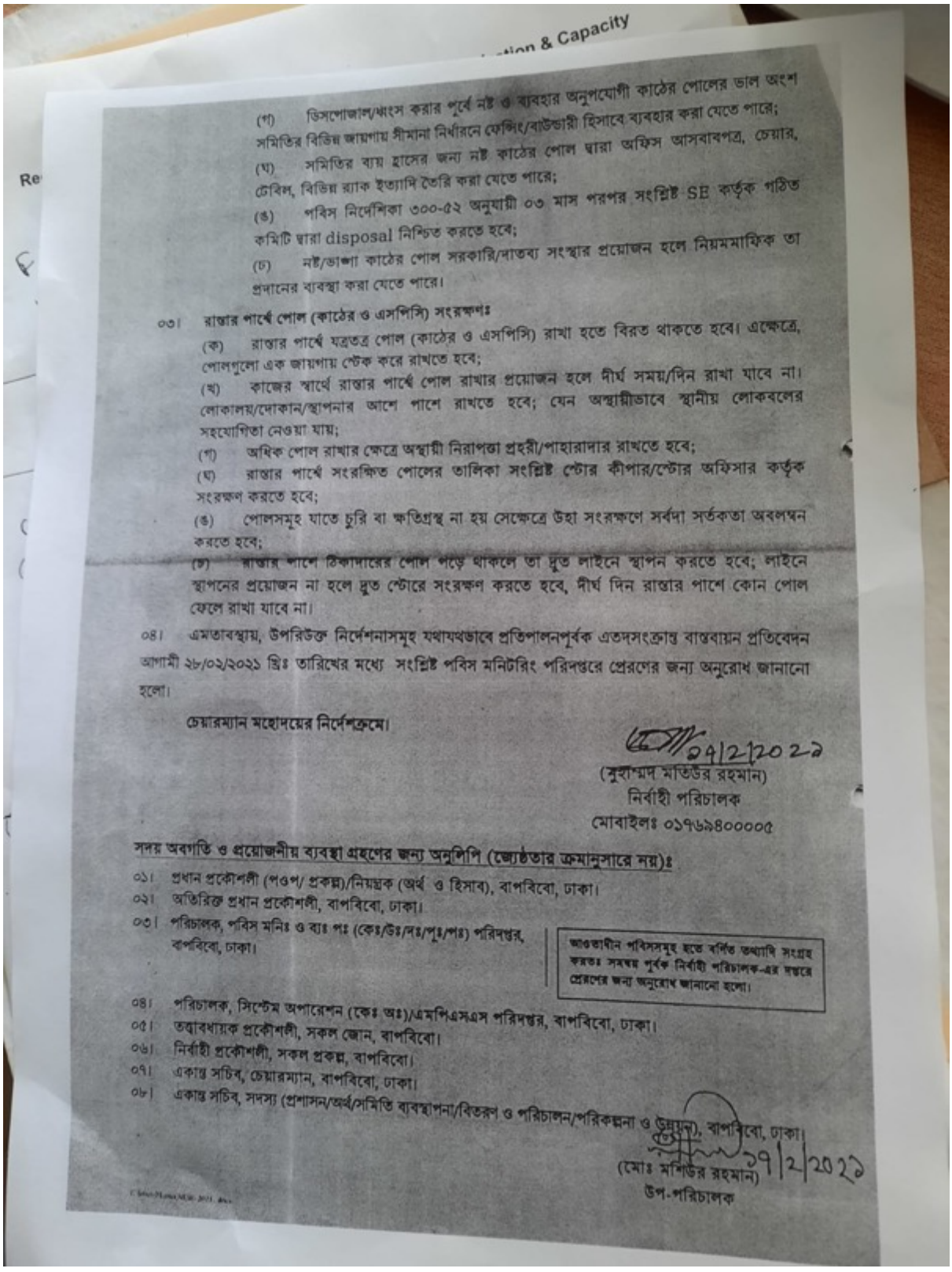
(ছ) কাঠের পোল ইয়ার্ডে ধুমপান করা থেকে বিরত থাকতে হবে। কেউ ধুমপান করছে কিনা সে ব্যাপারে তীক্ষ্ণ নজরদারি বাড়াতে হবে;

(জ) সমিতির অভ্যন্তরে পোল ইয়ার্ডে জায়গা সংকুলান না হলে সমিতির কাছাকাছি পোল ইয়ার্ড ভাড়া করতে হবে এবং ভাড়াকৃত পোল ইয়ার্ডে পোল সংরক্ষনের ক্ষেত্রে নজরদারি বাড়াতে হবে।

(ii) **কাঠের নষ্ট পোল সংরক্ষণ ও ব্যবহারঃ**

(ক) নষ্ট কাঠের পোল যত্রতত্র না রেখে পোল ইয়ার্ড এর নির্দিষ্ট স্থানে রাখতে হবে;

(খ) বড় সাইজের কাঠের পোল হতে নষ্ট অংশ আলাদা করে ছোট সাইজের পোল তৈরি, লগ তৈরি, ট্রান্সফরমার রি ওয়াইন্ডিং এর ফরমা তৈরি করা যেতে পারে।



...ion & Capacity

(গ) ডিসপোজাল/ধ্বংস করার পূর্বে নষ্ট ও ব্যবহার অনুপযোগী কাঠের পোলের ভাল অংশ সমিতির বিভিন্ন জায়গায় সীমানা নির্ধারনে ফেন্সিং/বাউন্ডারী হিসাবে ব্যবহার করা যেতে পারে;

(ঘ) সমিতির ব্যয় হ্রাসের জন্য নষ্ট কাঠের পোল দ্বারা অফিস আসবাবপত্র, চেয়ার, টেবিল, বিভিন্ন র‍্যাক ইত্যাদি তৈরি করা যেতে পারে;

(ঙ) পবিস নির্দেশিকা ৩০০-৫২ অনুযায়ী ০৩ মাস পরপর সংশ্লিষ্ট SE কর্তৃক গঠিত কমিটি দ্বারা disposal নিশ্চিত করতে হবে;

(চ) নষ্ট/ভাঙ্গা কাঠের পোল সরকারি/দাতব্য সংস্থার প্রয়োজন হলে নিয়মমাফিক তা প্রদানের ব্যবস্থা করা যেতে পারে।

০৩। রাস্তার পার্শ্বে পোল (কাঠের ও এসপিসি) সংরক্ষণঃ

(ক) রাস্তার পার্শ্বে যত্রতত্র পোল (কাঠের ও এসপিসি) রাখা হতে বিরত থাকতে হবে। এক্ষেত্রে, পোলগুলো এক জায়গায় স্টেক করে রাখতে হবে;

(খ) কাজের স্বার্থে রাস্তার পার্শ্বে পোল রাখার প্রয়োজন হলে দীর্ঘ সময়/দিন রাখা যাবে না। লোকালয়/দোকান/স্থাপনার আশে পাশে রাখতে হবে; যেন অস্থায়ীভাবে স্থানীয় লোকবলের সহযোগিতা নেওয়া যায়;

(গ) অধিক পোল রাখার ক্ষেত্রে অস্থায়ী নিরাপত্তা প্রহরী/পাহারাদার রাখতে হবে;

(ঘ) রাস্তার পার্শ্বে সংরক্ষিত পোলের তালিকা সংশ্লিষ্ট স্টোর কীপার/স্টোর অফিসার কর্তৃক সংরক্ষণ করতে হবে;

(ঙ) পোলসমূহ যাতে চুরি বা ক্ষতিগ্রস্থ না হয় সেক্ষেত্রে উহা সংরক্ষণে সর্বদা সর্তকতা অবলম্বন করতে হবে;

(চ) রাস্তার পাশে ঠিকাদারের পোল পড়ে থাকলে তা দ্রুত লাইনে স্থাপন করতে হবে; লাইনে স্থাপনের প্রয়োজন না হলে দ্রুত স্টোরে সংরক্ষণ করতে হবে, দীর্ঘ দিন রাস্তার পাশে কোন পোল ফেলে রাখা যাবে না।

০৪। এমতাবস্থায়, উপরিউক্ত নির্দেশনাসমূহ যথাযথভাবে প্রতিপালনপূর্বক এতদসংক্রান্ত বাস্তবায়ন প্রতিবেদন আগামী ২৮/০২/২০২১ খ্রিঃ তারিখের মধ্যে সংশ্লিষ্ট পবিস মনিটরিং পরিদপ্তরে প্রেরণের জন্য অনুরোধ জানানো হলো।

চেয়ারম্যান মহোদয়ের নির্দেশক্রমে।

24/2/2021

(মুহাম্মদ মতিউর রহমান)
নির্বাহী পরিচালক
মোবাইলঃ ০১৭৬৯৪০০০০৫

সদয় অবগতি ও প্রয়োজনীয় ব্যবস্থা গ্রহণের জন্য অনুলিপি (জ্যেষ্ঠতার ক্রমানুসারে নয়)ঃ

০১। প্রধান প্রকৌশলী (পওপ/ প্রকল্প)/নিয়ন্ত্রক (অর্থ ও হিসাব), বাপবিবো, ঢাকা।
০২। অতিরিক্ত প্রধান প্রকৌশলী, বাপবিবো, ঢাকা।
০৩। পরিচালক, পবিস মনিঃ ও ব্যঃ পঃ (কেঃ/উঃ/দঃ/পুঃ/পঃ) পরিদপ্তর, বাপবিবো, ঢাকা।

আওতাধীন পবিসসমূহ হতে বর্ণিত তথ্যাদি সংগ্রহ করতঃ সমন্বয় পূর্বক নির্বাহী পরিচালক-এর দপ্তরে প্রেরণের জন্য অনুরোধ জানানো হলো।

০৪। পরিচালক, সিস্টেম অপারেশন (কেঃ অঃ)/এমপিএসএস পরিদপ্তর, বাপবিবো, ঢাকা।
০৫। তত্ত্বাবধায়ক প্রকৌশলী, সকল জোন, বাপবিবো।
০৬। নির্বাহী প্রকৌশলী, সকল প্রকল্প, বাপবিবো।
০৭। একান্ত সচিব, চেয়ারম্যান, বাপবিবো, ঢাকা।
০৮। একান্ত সচিব, সদস্য (প্রশাসন/অর্থ/সমিতি ব্যবস্থাপনা/বিতরণ ও পরিচালন/পরিকল্পনা ও উন্নয়ন), বাপবিবো, ঢাকা।

24/2/2021

(মোঃ মশিউর রহমান)
উপ-পরিচালক

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Appendix 18: Sample Waste Management Plan

1.GENERAL

Considerable quantities of waste (general & construction) will be generated due to the construction of water supply schemes. Three types of wastes will be generated during construction:

- General Waste: Organic waste (foods, fruits, tree leaves etc.) and Inorganic (such as papers, plastic and glass bottles & containers, polythene etc.);
- Construction wastes: construction materials such as sand, piece of rocks, bricks, rods, geotextiles etc.
- Hazardous waste: chemicals, Oil, grease etc. from construction machinery etc.

2. OBJECTIVES

The main objective of the WMP is to organize disposal of all wastes generated during construction in an environmentally acceptable manner specially consider the following:

- Health hazards of the project personnel as well as community people should not be occurred;
- Manage the wastes in such a way that environment (specially air, soil, water etc,) will not be polluted;
- Odor means bad smell should not be generated;
- Always friendly environment at the construction sites and construction camps.

3. SITE FOR DISPOSAL OF WASTES

Contractor will select the site for disposal of general wastes at the area within the construction camp at some site which is as much as possible far away from the project workers' and community residents & cultural site.

4. METHOD OF DISPOSAL OF WASTES

4.1 General Waste

Contractor will collect the general wastes in separate waste bin at sources (means organic waste in one bin & inorganic waste in another bin) and dumped at the designated waste disposal site. The Contractor will construct concrete waste disposal site (means concrete floor and wall and covered by shed to avoid, air, bad smell, soil and ground water pollutions. Based on the quantity of general waste (organic & inorganic waste), the following three chambers (rooms) of the concrete disposal site will be constructed by Contractor-

- Two chambers for organic waste;
- One Chamber for inorganic waste.

Just after filling one chamber (say after 6 months) by organic waste through pocket gate, it should be covered by earth (soils) properly & keeps it for about 6 months for converting organic fertilizer for the agricultural lands. After filling 1st chamber by organic waste, disposing of waste will be started for 2nd chamber.

In the same way, inorganic waste will be dumped in the chamber, designated for inorganic waste. Just after filling, these inorganic wastes can be given to the vender free of cost. Contractor collects construction waste separately & dump in to the room at the designated area. Contractor will maintain log book for the measurement of quantity of the waste, disposed every day.

4.2 Construction Waste

- Organize disposal of all wastes generated during construction in an environmentally acceptable manner. This will include consideration of the nature and location of disposal site, so as to cause less environmental impact.
- Train and instruct all personnel in waste disposal practices and procedures as a component of the environmental induction process.
- Make sure all containers, drums, and tanks that are used for storage are in good condition and are labeled with expiry date. Any container, drum, or tank that is dented, cracked, or rusted might eventually leak. Check for leakage regularly to identify potential problems before they occur.
- Minimize the production of waste materials by 3R (Reduce, Recycle and Reuse) approach.
- Segregate and reuse or recycle all the wastes, wherever practical.
- Prohibit burning of solid waste.
- Provide reuse containers at each worksite.
- Request suppliers to minimize packaging where practicable.
- Maintain all construction sites in a cleaner, tidy and safe condition and provide and maintain appropriate facilities as temporary storage of all wastes before transportation and final disposal.

4.3 Hazardous Waste

- Transport waste of dangerous goods, which cannot be recycled, to a designated disposal site.
- Provide absorbent and containment material (e.g., absorbent matting) where hazardous materials are used and stored and personnel trained in the correct use.
- Provide protective clothing, safety boots, helmets, masks, gloves, goggles, to the construction personnel, appropriate to materials in use.
- Provide protective clothing, safety boots, helmets, masks, gloves, goggles, to the construction personnel, appropriate to materials in use.
- Avoid the use of material with greater potential for contamination by substituting them with more environmentally friendly materials.
- Organize disposal of all wastes generated during construction in an environmentally acceptable manner. This will include consideration of the nature and location of disposal site, so as to cause less environmental impact.
- Train and instruct all personnel in waste disposal practices and procedures as a component of the environmental induction process.

5. INSTITUTIONAL ARRANGEMENT

The Contractor will mainly responsible for environmental monitoring for the waste management. The PIU-BREB will setup a 'Waste Management Committee' with the representatives of the Contractor to effectively disposing the wastes. The committee is also responsible for monitoring procedure for the collection and carrying of wastes without causing any environmental hazards.

Hazardous waste. Storage, handling, transport, and final disposal should follow relevant regulations and international good industry practices (GIIP). Key that contractor hires a hazardous waste subcontractor. This Waste management Plan will be used by contractor and enhanced mitigation measures should be applied in prior to mobilization on the site.

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Appendix 19: Received Environmental Clearance Certificate from DoE

শেখ হাসিনার নির্দেশ
জলবায়ু সহিষ্ণু বাংলাদেশ

Government of the People's Republic of Bangladesh
Department of Environment
Head Office, Paribesh Bhaban
E-16 Agargaon, Sher-e-Bangla Nagar, Dhaka-1207
www.doe.gov.bd

Memo No: 22.02.0000.018.72.059.21- 186 Date: December 30, 2021

Subject: **Environmental Clearance for Modernization and Capacity Enhancement Project of BREB Network (Rajshahi-Rangpur Division)**

Ref: Your Application received on 18/11/2021.

With reference to the above, the Department of Environment (DoE) hereby accords the Environmental Clearance to **Modernization and Capacity Enhancement Project of BREB Network (Rajshahi-Rangpur Division) subject to fulfilling the following terms and conditions:**

1. This Environmental Clearance Certificate is valid for the following activities in 12 districts namely Bogura, Joypurhat, Naogaon, Natore, Pabna, Sirajganj under Rajshahi Division and Dinajpur, Kurigram, Lalmonirhat, Nilphamari, Rangpur and Thakurgaon under Rangpur Division:
   a) Construction of 3043 km of 33 KV new distribution lines
   b) Upgradation of 1015 km of existing distribution lines
   c) Construction of 153 km of 33 KV new underground lines
   d) Construction of 10 km of 33 KV submarine cable lines
   e) Construction of 5830 km of 11 KV distribution lines
   f) Upgradation of 18,382 km of 11KV existing distribution lines
   g) Construction of 723 km of 11 KV underground lines
   h) Construction of 46 km of 11 KV submarine cable lines
   i) Construction of 8587 km of 11 KV insulated lines
   j) Conversion of 8321 km LT to HT lines
   k) Conversion of 9218 km HT 1-ph to HT 3-ph lines
   l) Construction of 06 sets of river crossing tower
   m) Construction of 08 nos. of 20MVA and 107 nos. of 10 MVA 33/11KV new Substation (total 1210 MVA)
   n) Upgradation (Augmentation) 65 nos. of 33/11 kv (total 640 MVA extension) existing substations.
2. The activity under this Project shall not result in the loss of containment of any materials that would affect health or will have damaging impact on the environment or natural resources.
3. Proper and adequate sanitation facilities shall be ensured in labor camps throughout the proposed construction program.
4. No solid waste can be burnt in the project area. The project authority shall collect, treat and dispose off all solid wastes in such manner so as not to cause environmental pollution.
5. Proper and adequate on-site precautionary measures and safety measures shall be ensured so that no habitat of any flora and fauna would be demolished or destructed.
6. All the required mitigation measures suggested in the EIA report along with the emergency response plan are to be strictly implemented and kept operative/functioning on a continuous basis.
7. To reduce dust, spraying of water over the earthen materials should be carried out from time to time.
8. To control dust, during construction period spraying of water on the earthen materials should be carried out from time to time.
9. The project authority shall ensure that the ambient noise levels within the project sites shall not exceed the limits specified in the Noise Pollution (Control) Rules, 2006.
10. Construction material should be properly disposed off after the construction work is over.

পরিবেশ অধিদপ্তর
জলবায়ু সহিষ্ণু বাংলাদেশ

11. As described in the report environmental monitoring should be strictly followed and monitoring report should be shared with DoE to ensure the environmental management properly.
12. At the time of commissioning of the distribution lines, underground lines, insulated lines, substation and other construction/ upgradation utmost precautionary measures should be taken to reduce the possibility of accident.
13. The Environmental Management Plan (EMP) included in the EIA Report shall strictly be implemented and kept functioning on a continuous basis.
14. All pollution incidents shall be reported immediately and simultaneously to the nearby Office of the Department of Environment.
15. Full and adequate utilization of the techniques for mitigation of pollution and environmental damage as well as that for treatment of wastes shall be ensured.
16. Comprehensive Environmental Performance report shall be submitted on a monthly basis to the DoE Head Office as well as Rajshahi and Rangpur Divisional offices including actual intervention and the rehabilitation, mitigation and treatment options adopted at the project site.
17. All parameters of effluent discharge and gaseous emission shall be within the limits in the Environment Conservation Rules (ECR) 1997. In case of hazardous waste shall be adhered to Hazardous Waste and Ship breaking Waste Management Rules, 2011.
18. There shall be specific format for Environment Monitoring. Environmental Monitoring Reports shall be made available to DoE Head Office, DoE Rajshahi and Rangpur Divisional office on a monthly basis during the whole period of the development project.
19. Rehabilitation of human settlement or compensation for any sort of activity which will incur damage or loss of public or private property or any natural resources shall be addressed as per Government of Bangladesh rules and regulations;
20. Appropriate permission would be required to obtain from the Forest Department in favor of cutting/felling of any plant/tree/sapling forested by any individual or government before doing such type of activity.
21. Bangladesh Rural Electrification Board (BREB) shall extend active cooperation to DoE officials to facilitate their visit to the site as and when necessary.
22. This clearance is valid for one year from the date of issuance and the project authority shall apply for renewal to the Head office of DoE with copies to Rajshahi and Rangpur Divisional Office of DoE at least 30 days ahead of expiry.
23. Violation of any of the above mentioned conditions shall render this Environmental Clearance as void and legal action will be taken as per Environmental Conservation Act, 1995 and relevant Rules made under the Act.
24. This Environmental Clearance Certificate has been issued with the approval of the appropriate authority.

30.12.21

(Masud Iqbal Md. Shameem)
Director (Environmental Clearance)
Phone # 8181673

Project Director
Modernization and Capacity Enhancement Project of BREB Network (Rajshahi-Rangpur Division)
Training Academy Building (5th floor)
BREB, Nikunja-2, Khilkhet, Dhaka.

Copy Forwarded to:

1. PS to Secretary, Ministry of Environment, Forest and Climate Change, Bangladesh Secretariat, Dhaka.
2. Director, Department of Environment, Rajshahi Divisional Office, Bogura.
3. Director, Department of Environment, Rangpur Divisional Office, Rangpur.
4. Assistant Director, Office of the Director General, Department of Environment, Head Office, Dhaka.

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Appendix 20: Sample Navigation Clearance Certificate obtain from BIWTA.

বাংলাদেশ অভ্যন্তরীণ নৌ-পরিবহন কর্তৃপক্ষ

BANGLADESH INLAND WATER TRANSPORT AUTHORITY

Website: www.biwta.gov.bd

Facebook page: www.facebook.com/biwta1958

বিআইডব্লিউটিএ ভবন, ১৪১-১৪৩ মতিঝিল বাণিজ্যিক এলাকা, পোস্ট বক্স নং-৭৬, ঢাকা-১০০০, বাংলাদেশ।

BIWTA BHABAN, 141-143, MOTIJHEEL C/A, POST BOX 76, DHAKA-1000, BANGLADESH

প্রধান প্রকৌশলীর দপ্তর

নথি নং-১৮.১১.০০০০.২৬৭.৯৯.০৩০.১৬/ ৭২৮ তারিখ ২৯/০৩/২০২১ খ্রি।

তত্ত্বাবধায়ক প্রকৌশলী
বাংলাদেশ পল্লী বিদ্যুতায়ন বোর্ড
বরিশাল জোন, বরিশাল।

বিষয়ঃ বাংলাদেশ অভ্যন্তরীণ নৌ-পরিবহন কর্তৃপক্ষের মালিকানাধীন জমিতে নির্মিতব্য ৩৩ কেভি ডাবল সার্কিট রিভার ক্রসিং টাওয়ার নির্মাণে অনাপত্তি প্রদান প্রসঙ্গে।

সূত্র ঃ বাংলাদেশ পল্লী বিদ্যুতায়ন বোর্ড, বরিশাল এর স্মারক নং-২৭.১২.০৬৫১.০৩২.০১.০০১.২০-৯৩৫, তারিখ ৩০/১২/২০২০ খ্রি।

উপর্যুক্ত বিষয়ে সূত্রস্থিত স্মারকের প্রেক্ষিতে নির্দেশক্রমে জানানো যাচ্ছে যে, বিষয়ে বর্ণিত বাংলাদেশ পল্লী বিদ্যুতায়ন বোর্ডের আওতাধীন ঝালকাঠি জেলার সদর উপজেলাধীন গাবখান চ্যানেলের উপর দিয়ে ৩৩ কেভি ডাবল সার্কিট রিভার ক্রসিং টাওয়ার নির্মাণের লক্ষ্যে নিম্নোক্ত ছক অনুযায়ী ভার্টিক্যাল ক্লিয়ারেন্স প্রদান করা হলোঃ-

নদীর নাম	নৌ-পথের শ্রেণি	SHWL (Meter in PWD)	ক্লিয়ারেন্স (মিটারে)
গাবখান চ্যানেল	১ম শ্রেনী	২.৬০	১৮.৩০+৩.০৫ = ২১.৩৫মিঃ

শর্তসমূহ

১) অভ্যন্তরীণ জল পথের উপর বৈদ্যুতিক ওভারহেড লাইন নির্মাণের ক্ষেত্রে বৈদ্যুতিক ইনডাকশন হতে নিরাপত্তার জন্য সর্বনিম্ন ঝুলন্ত তার হতে উন্নত ছাড়ের (ভার্টিকেল ক্লিয়ারেন্স) নুন্যতম পরিমাপের সহিত অতিরিক্ত ৩.০৫ মিটার যোগ করতে হবে।

২) গাবখান চ্যানেলের উপর বৈদ্যুতিক লাইন স্থাপনের ক্ষেত্রে শুরুর পয়েন্ট হতে শেষ পয়েন্ট পর্যন্ত প্রতিটি Span এর মধ্যবর্তী স্থানে একই উচ্চতায় ক্যাবল স্থাপন করতে হবে।

৩) বৈদ্যুতিক ওভার হেড লাইন নির্মাণের পর নিরাপদ নৌ-চলাচলের জন্য নেভিগেশন চ্যানেলের উভয় পিলারের মধ্যবর্তী তারের ভিন্ন ভিন্ন স্থানে অন্ধকারের প্রজ্জলিত হয় এমন লাল রঙ্গের গোলক বাতি স্থাপন করতে হবে;

৪) বৈদ্যুতিক তারের সর্বনিম্ন Sag পয়েন্টের Minimum Navigational Clearance সর্বোচ্চ Standard High Water Level (SHWL) হতে উপরের উল্লেখিত ভার্টিক্যাল ক্লিয়ারেন্স রাখতে হবে;

৫) উল্লেখিত নদীর ক্রসিং পয়েন্ট সমূহে স্থাপিত ক্যাবল অবশ্যই সঠিকভাবে ইনসুলেশন করা থাকতে হবে।

৬) নদী অতিক্রমন লাইনে এবং উভয় পার্শ্বে স্থাপিত পোলের গায়ে উলম্ব ছাড়ের পরিমাপ সু-স্পষ্টাক্ষরে লিখতে হবে যেন সঞ্চালন লাইন অতিক্রমকারী নৌ-যানের মাষ্টার/চালকগনের সহজেই দৃষ্টিগোচর হয়।

৭)কাজ চলাকালীন সময়ে নৌ-যান চলাচলে বিঘ্ন ঘটানো যাবেনা। সকল প্রকার সর্তকতা মূলক ব্যবস্থা গ্রহন করতে হবে।

২৯/৩/২১
(মোঃ আশরাফুর রহমান)
সহকারী পরিচালক (প্রশাসন)

Bangladesh Inland Water Transport Authority

BANGLADESH INLAND WATER TRANSPORT AUTHORITY

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Office of the Chief Engineer

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Superintending Engineer

Bangladesh Rural Electrification Board

Barisal Zone, Barisal.

Subject: Regarding giving no objection to the construction of 33 KV double circuit river crossing tower to be built on the land owned by Bangladesh Inland Water Transport Authority.

Source: Bangladesh Rural Electrification Board, Barisal Memorandum No-27.12.0651,032.01.001,20-935, Dated: 30/12/2020 AD

In view of the above mentioned memorandum, it is hereby informed that for the purpose of construction of 33 KV Double Circuit River Crossing Tower over Gabkhan Channel under Sadar Upazila of Jhalkathi District under Bangladesh Rural Electrification Board, vertical clearance has been granted as per the table below:-

river name	Class of waterways	SHWL (Meter in PWD)	Clearance (in meters)
Gabkhan channel	1st Class	2.60	18.30+3.05 = 21.35m

Conditions:

1) In case of construction of electric overhead lines on inland waterways, an additional 3.05 m should be added with a minimum measurement of vertical clearance from the minimum hanging wire for safety from electric induction.

2) In case of installation of electric line on Gabkhan channel, cables should be placed at the same height between each span from the starting point to the end point.

3) After the construction of electric over head line, for safe navigation, dark red spherical lights should be installed at different places on the cables between the two pillars of the navigation channel;

4) The Minimum Navigational Clearance of the lowest Sag point of the electric cable shall be the above mentioned vertical clearance from the maximum Standard High Water Level (SHWL);

5) Cables laid at the mentioned river crossing points must be properly insulated.

6) The measurement of vertical clearance shall be clearly marked on the poles placed on the river crossing line and on both sides so as to be easily visible to the masters/pilots of vessels crossing the transmission line.

7) During the work, the traffic shall not be obstructed. All precautionary measures should be taken.

(Md Ashrafur Rahman)

Assistant Director (Administration)

Appendix 21: Site Visit Pictures during AIIB mission