ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) OF CUMILLA ECONOMIC ZONE LIMITED

FINAL REPORT

VOLUME III: ANNEXURE

PREPARED BY

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DHAKA, BANGLADESH

DECEMBER, 2023

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Terms of Reference of the ESIA

ToR FOR ESIA STUDY OF IE/EZ

The following ToR is a part of the "Guidelines For ESIA Study of Industrial Estates (IE)/ Economic Zones / Export processing Zones/ Industrial Parks Development under IPFF-II Project" developed by IPFF-II Bangladesh Bank. The purpose of this ToR is to guide the sponsors of the sub-projects of Industrial Estates (IE) and similar entities in different names such as Economic Zones (EZ), Export Processing Zones (EPZ) etc. in preparing their ESIA study complying the World Bank Group Performance Standards under the Operational Policy 4.03 (WBG PS OP 4.03) and GOB requirements.

Introduction

Environmental and Social Impact Assessment (ESIA) is a process of identifying, predicting, evaluating and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made. The ESIA study integrates the environmental concerns of developmental activities into the process of decision-making. An ESIA report will include a study of each of the Significant Environmental Components (SECs) identified during the screening stage of the Industrial Estates (IE)/Economic Zone (EZ) sub-project. In general, the ESIA study covers the following aspects:

- Screening of sub-projects based on applicable reference framework, reconnaissance survey and field-based assessment of the WBG PS OP 4.03;
- Scoping for the ESIA study by identifying the applicable Performance Standards;
- Development of a regulatory, policy and administrative framework relevant to the sub-project;
- Monitoring, analysis and reporting of the environmental and social baseline data of the study area including consultation with local communities and other stakeholders;
- Identification of the needs for studies for Assessment of the Environmental Impacts of the sub-project in the study area;
- Assessment of social impacts on the local community as well as PAPs (Project Affected Persons) (if any) and any other stakeholders, which will be identified during the social consultation process;
- Risk assessment and consequence analysis of the sub-project;
- Formulation of an Environment and Social Management Plan and associated/specific mitigation plans for identified impacts and
- Formulation of Stakeholder Consultation and Grievance Redress Mechanism for the sub-project.

ESIA studies may include, but may not be limited to the following:

INTRODUCTION OF THE SUB-PROJECT

This chapter will address sub-project background, objectives, scope of work, methodology incorporating categorization, scoping, screening, consultation meetings, reconnaissance survey, data collection scheming, impact assessment & mitigation measures, analysis of alternatives, grievance redress mechanism, management plans, information/data sources etc., ESIA team and ESIA report structure.

POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

This chapter will describe the World Bank operational guideline Performance Standards for Private Sector Activities (OP 4.03) as well as the applicable national Environmental and Social policies and regulations, the WBG Performance Standards (PS) triggering for the sub-project, policies, act and regulations related to Industrial Estates (IE)/Economic Zone (EZ) development and applicable environmental standards for the sub-project.

DESCRIPTION OF THE SUB-PROJECT:

This chapter will describe the following-

- Land use plan for the project including the peripheral greenbelt inside the boundary;
- Details of the Industries/Economic Zone (EZ), for which the IE/EZ/EPZ is being planned and their proposed capacities of installation, if available. If complete details are not available then indicate the type of industries and capacity being considered;
- Justification for selecting the proposed size of the sub-project;
- Details on strategy being followed for development of sub-project;
- Layout map of sub-project indicating processing zones/parks area, admin area, roads, plots, green belt, common utilities area, etc., shall be shown along with contour map. Landscape plan including open spaces may be described;
- Various environmental planning and design measures can be adopted following the Bangladesh National Building Code 2020 in the processing zones/parks for developing 'Green Layout' including-
    - » Water recycling & reuse;
    - » Conserving site geology;
    - » Conserving site vegetation;
    - » Adherence to site contours;
    - » Energy efficient street lighting;
    - » Water conserving landscaping;
    - » Eco-friendly transportation on-site;
    - » Reduction of outdoor light pollution;
    - » Soil conservation and erosion control;
    - » Provision for minimum local amenities;
    - » Provisions for waste management on-site;
    - » Provisions for rainwater harvesting on-site;
    - » Layout planning & design as per solar geometry;
    - » Zero discharge of wastewater if feasible and storm water from site;
    - » Provisions for safe disposal of unused treated wastewater;
    - » Operation & maintenance requirement for decentralized Wastewater Treatment System (WWTS) and
    - » Integrated approach for Sustainable Urban Drainage System (SUDS).

- Classify the proposed industries/parks based on their pollution potential (air pollution, water pollution) to the extent possible.

- Backward and forward linkages of the IE/EZ/EPZ (availability of input resources and markets for the products / by-products and anticipated benefits for the regional development).
- Details of Infrastructure Development within the IE/EZ/EP/TP/PD and in the region.
- Details on known industrial activities i.e. specific proposed processes, resource consumption and assessment criteria of rejected material.
- Details on estimated quantity of fuel required, fuel type, nature, source and transportation.
- Details on estimated water balance taking into account conservation measures, reuse and recycling of treated effluents.
- Individual and/or common facilities for waste collection, treatment, recycling and disposal (all effluent, emission and refuse including *Municipal Solid Waste*, and hazardous wastes).
- Commitment from the concerned authorities regarding availability of power, water and sewerage network.
- Details of Solid Waste Management including arrangements for hazardous waste management and e-waste.
- Details on provisions made for safety in storage of materials, products and wastes.
- Details on use of local building materials.
- Detailed plan of treated water disposal, reuse and utilization/management.
- In case of site leveling involving quarrying, details thereof.
- Any litigation pending against the sub-project and /or any direction /order passed by any Court of Law related to the environmental pollution and impacts in the last two years, if so, details thereof.
- Details of the Sub-project activity schedule and project costing.

DESCRIPTION OF THE ENVIRONMENT

- The sub-project study area for ESIA studies shall be up to a distance of 5 km environmental and 2 km for social aspects from the boundary of the proposed IE/EZ/EPZ. Although 5km radius is usually considered as impact zone, in IPFF-II the zone should be extended if there are VECs which are likely to be impacted.
- Location of the sub-project site and nearest habitats with distances from the project site to be demarcated on a top sheet (1: 50000 scale).
- Land use based on satellite imagery including location specific sensitivities such as national parks / wildlife sanctuary, villages, industries, etc. for the study area.
- Demographic details of all the villages falling within the study area.
- Topographic details of the project area.
- Anticipated pollution loads from each of the known composition of industrial units. Cumulative wastewater quantity and pollution load, point source specific details for air pollutants and their loads, total solid/hazardous waste generation etc.
- Details of rainwater harvesting and how it will be used in the IE/EZ/EP/TP/PD & outfall of rainwater harvesting.

- The baseline data to be collected from the study area with respect to different components of environment. Important Physical Environment Components are listed below.

Sl. No.	Environmental Component	Environmental Indicators
1.	**Climatic variables**	➢ Rainfall patterns – mean, mode, seasonality ➢ Temperature patterns ➢ Extreme events ➢ Climate change projections ➢ Prevailing wind - direction, speed, anomalies ➢ Relative humidity ➢ Stability conditions and mixing height, etc.
2.	**Topography**	➢ Slope form ➢ Landform and terrain analysis ➢ Specific landform types, etc.
3.	**Drainage**	➢ Surface hydrology ➢ Natural drainage pattern and network ➢ Rainfall runoff relationships ➢ Hydrogeology ➢ Groundwater characteristics – springs, etc.
4.	**Soil**	➢ Type and characteristics ➢ Porosity and permeability ➢ Sub-soil permeability ➢ Run-off rate ➢ Infiltration capacity ➢ Effective depth (inches/centimetres) ➢ Inherent fertility ➢ Suitability for method of sewage disposal, etc.
5.	**Geology**	➢ Underlying rock type, texture ➢ Surgical material ➢ Geologic structures (faults, shear zones, etc.) ➢ Geologic resources (minerals, etc.)
6.	**Water quality**	➢ Raw water availability ➢ Water quality ➢ Surface water (rivers, lakes, ponds, gullies) – quality, water depths, flooding areas, etc. ➢ Ground water – water table, local aquifer storage capacity, specific yield, specific retention, water level depths and fluctuations, etc. ➢ Coastal Floodplains ➢ Wastewater discharges ➢ Waste discharges, etc.
7.	**Air quality**	➢ Ambient

Sl. No.	Environmental Component	Environmental Indicators
		➢ Reparability ➢ Air shed importance ➢ Odour levels, etc.
8.	**Coastal dynamics and morphology**	➢ Wave patterns ➢ Currents ➢ Shoreline morphology – near shore, foreshore ➢ Sediment – characteristics and transport, etc.
9.	**Biological**	➢ Species composition of flora and fauna ➢ Flora – type, density, exploitation, etc. ➢ Fauna – distribution, abundance, rarity, migratory, species diversity, habitat requirements, habitat resilience, economic significance, commercial value, etc. ➢ Fisheries – migratory species, species with commercial/ recreational value, etc.
10.	**Land use**	➢ Land use pattern, etc.

- Identification of existing potential sources of pollution in the study area.
- Present and projected population; present and proposed land use; planned development activities, issues relating to squatting and relocation, community structure, employment, distribution of income, goods and services; recreation; public health and safety; cultural peculiarities/ingenuities, aspirations and attitudes should be explored in study.
- Details regarding availability of social infrastructure and future projections, details of facilities such as sanitation, fuel, restroom etc. to be provided to the labour force during construction as well as to the casual workers including truck drivers during operation phase.
- Detailed study of the hydrological and geo-hydrological conditions of the project area including a contour plan indicating slopes and showing drainage pattern and outfall.
- Information regarding surface hydrology and water regime and impact of the same, if any due to the project.
- Examine soil characteristics, topography, rainfall pattern and soil erosion.
- Details on surface water quality of nearby water sources and other surface drains.
- Details of groundwater quality in and around the IE/EZ/EP/TP/PD.
- Examine water quality with reference to Persistent Organic Pollutants, if relevant.
- Details on water quality for parameters such as pH, Temperature (^oC), Oil and grease*, Cyanide* (as CN), Ammoniacal nitrogen* (as N), Phenolic compounds* (as C_6H_5OH), Hexavalent Chromium*, Total chromium*, Copper*, Nickel* , Lead*, Arsenic*, Mercury*, Cadmium*, Selenium*, Fluoride*, Boron*, Radioactive Materials*, Alfa emitters*, Hc/ml*, Beta emitters*, Hc/ml*, etc. (* - As applicable. These parameters to be determined depend on the type of industries coming in industrial estates.)
- Details on existing ambient air quality and expected, stack and fugitive emissions for PM_{10}, $PM_{2.5}$, SO_2, NOx, O_3, suspended particulates, volatile organic compound*, Mercury*, etc., and evaluation of the adequacy of the proposed pollution control devices to meet standards for point sources and to meet Bangladesh National Ambient Air

Quality Standards (NAAQS). The ambient air quality may be measured near the entrance of the IE, as short distance variation is unlikely. The parameter with Asterix should ne measured when required.

- However, with the operation of industries in the IE, the cumulative emission from many industries may add substantially to the air pollution, The cumulative air pollution levels with likely industries in the IE, has to be evaluated at VEC (Valued Environmental Components) such as Hospitals, Educational Institution and large population centers. This is done through calculations using Mathematical model such as AERMOD. This is discussed more in the annex.
- Ambient noise levels around the perimeter of IE should be measured using appropriate equipment. As with the air pollution level, the cumulative noise impact on the VECs have to be estimated using mathematical models such as Sound Plan. The VECs outside the 5km radius for impact assessment should be included if the impacts are high enough. Mor details are given in the annex.
- Site-specific meteorological data including mixing heights and secondary data for future predictions.
- Baseline data should be measured according to the national standards which include averaging time. These are discussed more in the annex.
- Field surveys and assessments should be recent, and data should be acquired for the direct project footprint, including related and associated facilities, the subproject's Area of Influence (AOI), and potentially beyond.
- Proposed baseline monitoring network for the consideration and approval of the competent authority.
- Fuel analysis to be provided (sulfur, ash content and mercury). Details of auxiliary fuel, if any including its quantity, quality, storage, etc., should also be given.
- Examine entry/exit of the project including the crossings from the highway and provision of service roads on the basis of traffic density studies and analysis.
- Climatic conditions of the study area shall be monitored for hourly wind speed, wind direction, relative humidity, ambient dry and wet bulb temperatures and precipitation. Ecological status (terrestrial and aquatic) of the study area such as habitat type and quality, species, diversity, rarity, fragmentation, ecological linkage, age, abundance, etc.
- If ecologically sensitive attributes fall within the study area, the sensitivity (distance, area and significance) should describe and propose the additional points based on significance for review and acceptance by the Department of Environment (DoE), Ministry of Environment and Forests. Ecological sensitive attributes include:
    - National parks
    - Wild life sanctuaries game reserve
    - Tiger reserve/elephant reserve/turtle nesting ground
    - Mangrove area
    - Wetlands
    - Reserved and protected forests, etc.
    - Any other closed/protected area under the Ecologically Critical Area, any other area locally applicable

- If any discordant land use attributes fall within the study area, proponent should describe the sensitivity (distance, area and significance) and propose the additional points based on significance for review and acceptance by the local authority. Discordant land use attributes include:
    - Public water supply areas from rivers/surface water bodies, from ground water;
    - Scenic areas/tourism areas/hill resorts;
    - Special religious places;
    - Protected tribal settlements (notified tribal areas where industrial activity is not permitted);
    - Monuments of national significance, World Heritage Sites;
    - Cyclone, Tsunami prone areas (based on last 25 years);
    - Airport areas;
    - Any other feature as specified by the local authority and other features as locally applicable, including prime agricultural lands, pastures, migratory corridors, etc.
- If the location falls under hilly area, specific issues connected to the natural resources management i.e. hill cutting management plan should be studied and presented.
- If the location falls under coastal region: A coastal region map duly authenticated by one of the authorized agencies demarcating Low Tide Line (LTL), High Tide Line (HTL), Coastal area, location of the sub-project and associate facilities with respect to coastal region, coastal features such as Mangroves, if any.
    - Provide the Coastal Region map in 1:10000 scale in general cases and in 1:5000 scale for specific observations.
    - Proposed site for disposal of dredged material and environmental quality at the point of disposal/impact areas.
    - Fisheries study should be done with respect to Benthos and Marine Organic Material and Coastal Fisheries.

ANTICIPATED ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES

- Anticipated generic environmental and social impacts due to different phases i.e. pre-construction, construction and operation of the sub-project are Physical (air, noise, climate, water, resources, soil etc.), Biological (terrestrial flora & fauna, aquatic biota etc.) and Social (economy, education, public order, infrastructure and services, security & services, health, culture etc.) which may be evaluated for significance and based on corresponding likely impacts of identified significant environmental and social components. Baseline studies may be conducted for all the concerned significant environmental and social components and likely impacts will have to be assessed for their magnitude in order to identify mitigation measures.
- Appropriate assessment of environmental impacts depends on capable ESIA practitioners. Choice of models/methods for impact predictions in respect of air, noise, water, land, biological environment and socio-economic aspects should be chosen by

the ESIA practitioner based on his/her experience and review of similar projects data and documents.

- While identifying the likely impacts, the following for analysis of significance and required mitigation measures should also be included:
    - Impacts due to transportation of raw materials and end products on the surrounding environment;
    - Impacts on surface Water, Soil, Groundwater, Drainage due to project activities;
    - Impacts due to Air Pollution;
    - Impacts due to Odor;
    - Impacts due to Noise;
    - Impacts due to Fugitive Emissions;
    - Impact on Health of workers due to proposed project activities.
- Examine in detail the proposed site with reference to possible impact of infrastructure covering water supply, pipelines, roads, storm water drainage, sewerage, power, temporary waste storage facilities, treated wastewater disposal (land/sewer/surface water bodies), common facilities, etc.
- Existing Environmental condition should be developed based on thethen industrial activities and pollution potentials.
- Details of traffic density vis-à-vis impact on the ambient air.
- Cumulative impact on regional supportive capacity shall be studied (refer to annexes on the issues) in terms of population density, water supply, sewerage, storm water drainage, power supply, educational facilities, medical facilities, public transport, traffic, housing for Low income communities, and community facilities, etc.
- Details on positive and negative impacts, direct and indirect impacts, induced impacts.
- Project activities and impacts should be represented in a matrix with separate matrices for pre and post mitigation scenarios.
- Traffic management plan including parking and loading/unloading areas may be described. Traffic survey should be carried out on week days and weekends and also analyze the anticipated traffic increase.
- Make provision of green cover e.g. mulching as a measure for mitigation of dust and noise and buffer between habitation and industry.
- Rain water harvesting proposals should be made with due safeguards for groundwater quality. Maximize recycling of water and utilization of rain water.
- Temporary plans for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile Sewage Treatment Plant (STP), safe drinking water, medical health care etc.
- Proposed measures for occupational safety and health of the workers.
- Impact of the project on local infrastructure of the area such as road network and whether any additional infrastructure would need to be constructed and the agency responsible for the same with time frame.
- Action plan for the greenbelt development – species, width of plantations, planning schedule etc. within the boundary around the IE/Parks in accordance with the national guidelines.

- In case of likely impact from the proposed sub-project on the surrounding reserve forests, Plan for the conservation of wild fauna in consultation with the Department of Forest.

ANALYSIS OF ALTERNATIVE RESOURCES AND TECHNOLOGIES

- Comparison of alternate sites considered and the reasons for selecting the proposed site. Conformity of the site with the prescribed guidelines in terms of coastal regions, river, highways, railways, etc.
- Evaluate alternative disposal modes of effluent and solid wastes, from disposal points and associated impacts point of view.
- All kind of resources both renewable and non-renewable should be taken into account.
- Details on improved technologies.

ENVIRONMENTAL & SOCIAL MONITORING PROGRAM

- Monitoring program for pollution control at source.
- Monitoring pollutants at receiving environment for the appropriate notified parameters – air quality, groundwater, surface water, etc. during operational phase of the project.
- Specific program to monitor safety and health protection of workers.
- Appropriate monitoring network should be designed and proposed, to assess the possible residual impacts on significant environmental components.
- Monitoring of Public Complaints/grievances through Grievance Redress Mechanism (GRM).
- Monitoring of Corporate Social Responsibilities (CSR) activities/programs for community development as per Stakeholder Mapping and Sponsor's policy.
- Details of in-house monitoring capabilities and the recognized agencies if proposed for conducting monitoring

PUBLIC CONSULTATION AND DISCLOSURE

- Introduction
- Approach and methodology
- Key findings from FGD, KII sessions and informal meetings
- FGD and meetings
- Key informant interview
- Public Disclosure

ADDITIONAL STUDIES

- Details on risk assessment and damage control during different phases of the project and proposed safeguard measures.
- Details on socio-economic development activities such as commercial property values, generation of jobs, education, social conflicts, cultural status, accidents, etc.
- Proposed plan to handle the socio-economic influence on the local community. The plan should include quantitative dimension as much as possible.

- Details on compensation package for the people affected by the project, considering the socio-economic status of the area, homestead ouster, land ouster, and landless laborers.
- Public hearing should be conducted as per the prescribed procedure of Grievance Redress Mechanism (GRM). Grievance Redress Committee (GRC) should record the points identified in the public hearing and commitment of the subproject proponent/sponsor. Detailed action plan addressing the issues raised, and the details of necessary allocation of funds.
- The historical importance of the area should also be examined in the study. While this analysis is being conducted, it is expected that an assessment of public perception of the proposed development be conducted.
- Describe the application of industrial ecology concept for planning of Industrial Estates (IEs). Explore possibility of utilizing waste of one unit as raw material for the other units.
- Specific chemical emergency response and proposed rescue system.
- Details on corporate social responsibility proposal.

ENVIRONMENTAL & SOCIAL MANAGEMENT PLAN

- Administrative and technical organizational structure to ensure proposed post-project monitoring program for approved mitigation measures.
- ESMP devised to mitigate the adverse impacts of the project should be provided along with item-wise cost of its implementation (capital and recurring costs).
- Allocation of resources and responsibilities for plan implementation.
- ESMP should be guided by various types of environmental, health, and social management plans e.g., Resettlement Action Plans, Biodiversity Action Plans, Water Resources Management Plans, Ecosystem Restoration Plans, Community Safety Plans, Community Development Plans or Indigenous People Plans.
- Details of the emergency preparedness plan and on-site and off-site disaster management plan.

ENVIRONMENTAL AND SOCIAL ACTION PLAN (ESAP)

ESAP should be prepared in accordance with the relevant provisions of the World Bank Performance Standard 1.

- ESAP should-
    - Describe the actions necessary to implement the various sets of mitigation measures or corrective actions to be undertaken; this will include timelines and scope for preparation and implementation of an ESMP and other specific management plans – such as a Biodiversity Management Plan, Resettlement Plan, Livelihood restoration Plan. Stakeholder Engagement Plan - to address E&S risks and impacts identified during the risks and impacts identification process;
    - prioritize the listed actions;
    - include the timeline for their implementation;
    - be disclosed to the affected communities; and

- describe the schedule and mechanism for external reporting on the sponsor's implementation of the ESAP.

The ESAP should also include measures to inform potentially affected people of the nature of transactions, potential impacts, mitigations measures and grievance mechanisms.

STRUCTURE OF AN ESIA REPORT

Sl. No.	Chapter	Contents
0.	**Executive Summary**	Executive Summary will cover the idea of the objectives of the proposal, use of resources, justification, etc. It will be a compilation of the ESIA report (ideally 10-15% of the main report) including ESMP and post-project monitoring plan in brief.
1.	**Introduction**	▪ Purpose of the report ▪ Identification of project & project proponent ▪ Brief description of nature, size, location of the project and its importance to the country, region ▪ Scope of the study – details of regulatory scoping carried out ▪ Approach and methodology
2.	**Project Description**	Brief description of the aspects of the sub-project (based on the feasibility study), likely to cause environmental effects. Details of the plan should be provided to give clear picture of the following: ▪ Project features including land use summary, connectivity and expected industries ▪ Need for the project ▪ Site Map showing utilities and connectivity ▪ Size or magnitude of operation (incl. Associated activities required by / for the project) ▪ Proposed schedule for approval and implementation ▪ Technology and process description ▪ Project activities during pre-construction and construction phases ▪ Description of mitigation measures incorporated into the project to meet environmental standards, environmental operating conditions, or other ESIA requirements (as required by the scope) ▪ Assessment of new & untested technology for the risk of technological failure ▪ Project cost break-up

Sl. No.	Chapter	Contents
3.	**Policy Legal and Administrative Framework**	▪ Describe the World Bank operational guideline Performance Standards for Private Sector Activities (OP 4.03) as well as the applicable national Environmental and Social policies and regulations ▪ Describe the WBG Performance Standards (PS) triggering for the sub-project ▪ Describe Fundamentals of ILO Conventions • Describe Environment-Related National Laws, Rules, Policies, Guidelines ➢ Policies, Act And Regulations Related To Economic Zones ➢ Assessment Of Policies ➢ National Social Policies, Laws And Regulations ➢ Institutional Arrangements At National And Sub-National Levels ➢ Environmental Clearance Process ➢ Applicable Environment Standards: Ambient Air Quality Standards,Water Quality Standards, Ambient Noise Standards
4.	**Baseline Environment And Assessment of Potential Impacts and Audit of Work Done**	• Introduction • Environmental Baseline on Air, Water and Noise quality, • Environmental Impacts ➢ Impacts During Pre-Construction Phase (Site Preparation) ➢ Impacts During Construction Phase ➢ Environmental Impacts During The Operation Stages ➢ Summary Of Impacts • Ecological Impacts ➢ Potential Ecological Impacts ➢ Evaluation Of Ecological Impact • Socio Economic Impacts ➢ Potential Socio-Economic Impact ➢ Evaluation Of Social Impacts ➢ Risk Assessment ➢ Environment And Social Audit Of Work Already Done
5.	**Analysis of Alternatives (Technology & Site)**	In case the scoping exercise results in need for alternatives: ▪ Description of each alternative ▪ Summary of adverse impacts of each alternative

Sl. No.	Chapter	Contents
		▪ Mitigation measures proposed for each alternative and selection of alternative
6.	**Public consultation and disclosure**	Details of • Focus group discussion • Key informant interview • Social auditing for existing industries • Describe the approach and methodology of public consultation • List down the key findings from Focus Group Discussion (FGD), Key Informant Interview (KII), informal meetings • Describe the public disclosure systems.
7.	**Anticipated Environmental, Social Impacts & Mitigation Measures** **ıvironmental Management Plan (ESMP)**	▪ Details of investigated environmental impacts due to project location, possible accidents, project design, project construction, regular operations, final decommissioning or rehabilitation of a completed sub-project ▪ Measures for minimizing and / or offsetting adverse impacts identified ▪ Irreversible and irretrievable commitments of environmental components ▪ Assessment of significance of impacts (Criteria for determining significance, assigning significance) ▪ Mitigation measures ▪ Description of administrative aspects that ensures proper implementation of mitigation measures and their effectiveness monitored, after approval of the ESIA ▪ Describe the monitoring program incorporating technical aspects of monitoring the effectiveness of mitigation measures (incl. measurement methodologies, frequency, location, data analysis, reporting schedules, emergency procedures, detailed budget & procurement schedules) ▪ Describe Hazardous material Management plan ▪ Describe the enhancement plan, contingency plan, and compensation plan ▪ Describe the OHS manage plan during construction and operation ▪ Emergency preparedness Plan
8.	**GAP analysis and Action Plan**	▪ Describe the actions necessary to implement the various sets of mitigation measures or corrective actions to be undertaken; this will include timelines and scope for preparation and implementation of an ESMP and other specific management plans – such as a Biodiversity Management Plan, Resettlement

Sl. No.	Chapter	Contents
		Plan, Livelihood restoration Plan. Stakeholder Engagement Plan - to address E&S risks and impacts identified during the risks and impacts identification process.
9.	**Conclusion and Recommendation (This will constitute the succinct summary of the study as well as the concise recommendations)**	▪ Overall justification for implementation of the project ▪ Explanation of how, adverse effects have been mitigated ▪ Overall recommendations for the sustainable development of the sub-projects

Tentative List of Annexes of the ESIA report:

- Initial Environmental and Social Screening
- Details of IE Plan with Drawings for all the layers
- Environmental, Social and Ecological baseline (In Details)
- Summary of applicable policies, laws and regulatory framework
- Climate Change and Disaster Risks Screening
- Attendance sheet for public consultation
- Environmental and Social Screening forms for new industries/Economic zones/parks under construction
- Environmental and Social Audit forms for existing industries/Economic zones/parks
- Sample Contract Agreement between IE/EZ/EP/TP/PD and other industries/parks
- Sample Land purchase agreement (willing buyer – willing seller)
- Emergency Response Plan
- Grievance Redress Mechanism
- Chance Find Procedures
- Occupational Health and Safety Procedure
- Labor Management Procedures including Human Resources Policy
- DoE and other Authorities Clearance Letters
- Environmental Management of CETPs, CSTP, TSDF and WTP

ANNEX-ii

Initial Environmental and Social Screening as per IPFF-II

INITIAL ENVIRONMENTAL AND SOCIAL SCREENING OF SUBPROJECTS

Sub-Project Title: Environmental and Social Impact Assessment (ESIA) of Cumilla Economic Zone Limited

Environmental and Social Screening Checklist

The purpose of this checklist is to identify potential environment and social issues related to project development, construction and operation. This is a generalized checklist (non-exhaustive) format for infrastructure projects. The user/ project proponent may complete the format, which will be reviewed by environmental and social professionals retained by the financial institution to help determine project eligibility for financing and initial E&S risk rating.

(A) Project Background

1.	Name of Proposed Project	Comilla Economic Zone Limited (CuEZL)
2.	Address and Location (geo coordinates from Google Map – right click, paste)	Sonachar Mouza, Luterchar Union, Meghna Upazila, Comilla District under Chittagong Division. 23.580251457340754, 90.64944241524348
3.	Link to the site from Google Maps (paste coordinates into GMap's search, enter, then click Share)	https://goo.gl/maps/umSPDH3Mk7wkYJdx6

4.	Project objective	To develop economic zone for attracting foreign direct investment in economic activity that could not otherwise be achieved. Various types of industries will be set up at this economic zone. A list of potential industries is shown in Annex ii-a. The expected employment will be 85% male and 15% female.
5.	Detailed description of the planned physical works (land clearance, filling, excavation, demolition, construction, etc, including measurements)	The Economic zone will cover the total area of 246.3615 acres of land. These land areas were treated as low and fallow land by local AC Land Office. At present CuEZL intends to develop on-site and off-site facilities with completion of filling low land and civil and construction works is under process. Land filling and development work is completed. Around 25.60 crore CFT sand is filled to the project. The Boundary wall construction of overall project area is also completed
		The construction of security shed & guard room, administrative building, residential building, internal road network and drainage work is going on. Other physical works i.e. Main Gate, Gas Regulatory Station & Distribution Network, Water Distribution Network & Pump house, Water Treatment Plant, Firefighting System Including Hydrant, Power Distribution Network, Electric Substation & Distribution Network, Telecommunication system, CETP, Sewerage Treatment Plant, Central Solid wage Management Area, Car parking hub including weigh bridge Cabin, Medical Centre and day care centre, Mosque, Fire station, Multipurpose commercial building, Park etc. will be started soon
6.	Capacity or size of the Project	246.3615 acres of land Layout plan with number of plot and size of the project is attached (Annex ii-b).
7.	Proposed date of commencement of work	The work of sub project started on Dec 2019. The site development has been completed and project is now on Construction phase. Project implementation schedule is attached (Annex ii-c)

8.	Proposed construction period	The construction work will be completed within November 2023
9.	Sector	Economic zone
10.	Executing Agency	Comilla Economic Zone Limited

Sub-project site map

(B) Activities on E&S List of Excluded Activities?

Sl. No	Screening Questions	Yes	No	Comments (In the case select "yes", provide detailed information)
1.	Is there a possibility of activities under the project that constitute excluded activities?		√	There is no possibility of any activities under the project that constitute excluded activities.
2.	If yes, can they be eliminated through adequate application of the provisions of the World Bank Performance Standards?		√	Not Applicable

(C) International Waterways and Disputed Territories

Sl. No	Screening Questions	Yes	No	Comments (In the case select "yes", provide detailed information)
1.	Is there a possibility of activities supported by the project that have impacts on international waterways?		√	There are no such activities that might have impacts on international waterways.
2.	Is the project site located in disputed territory?		√	There is no such disputed area within the project site. The project proponent has already received CEZ Gazette Notification S.R.O.-45 on 20 March 2022, regarding the land solely dedicated as Cummilla Economic Zone.

(D) Environmental and Social Screening of Sub-Project

Sl. No	Screening Questions	Yes	No	Comments (In the case select "yes", provide detailed information)
	Potential Environmental Impacts			
3.	Will the renovation work disturb other commercial/community/residential activities?		√	The project site is located a bit far from residential/ commercial/ community area and therefore, there is no possibility to disturb their activities due to renovation and construction work.
4.	Project's siting: Is the project site adjacent to or within any of the following sensitive receptors?			

Sl. No	Screening Questions	Yes	No	Comments (In the case select "yes", provide detailed information)
	i. Cultural heritage site		√	Nearest heritage site is Panam City which is around 11 km North of the project site. Another heritage site is Shalbon Bihar, Mainamoti, Cumilla, is far away (around 65 km East) from the project site.

	ii. Natural habitats and/ or legally protected areas (wetlands, forests, estuary, buffer zones, nature reserves); if yes, is there possibility of a critical habitat present?		√	There are no protected areas or critical habitat within the project site. Protection of natural habitats will be taken care of by Cumilla EZ Authority by adopting mitigation measures on a regular basis.
	iii. Fragmentation of habitat of flora and fauna?		√	The project is not expected to fragment any flora and fauna.
	iv. Are rivers and reservoirs present in direct proximity to project site?	√		A Meghna river branch
	v. Are canals and irrigation systems present in direct proximity to project site?		√	There is no canal in project area but a branch of Meghna river is located beside the project.
	vi. Is the proposed site located on agricultural land?	√		The project area used to be agricultural land, but it has been developed for the CuEZL with sand filling to the Meghna-Homna road level, which is above 50 years' flood level.
5.	Will the project potentially cause?			If select " yes", please describe and briefly assess impact's level
	i. Encroachment on historical/cultural areas		√	There is no such possibility of encroachment on historical/cultural areas due to project activities.
	ii. Impacts on natural resources that constitute livelihoods of community (e.g. water resources, fishing or hunting grounds)?		√	There is no possibilities of impacts on natural resources that constitute livelihoods of community.
	iii. Disfiguration of landscape?	√		At present, construction works are going on in the project site and the proposed

Sl. No	Screening Questions	Yes	No	Comments (In the case select "yes", provide detailed information)

				work will be performed within the defined area. The project area will be changed to industrial landscape from agricultural.
	iv. Change of surface water quality or water flows?		√	The project will install Water Treatment plant and ETP for its activities. Therefore, it is expected that the surface water quality will not be deteriorated due to the project.
	v. Increase in waste generation?	√		Construction and operation of the proposed Cumilla EZ will generate wastes which will need appropriate collection, transportation, primary treatment and disposal in an environmentally acceptable manner and as per the statutory requirements and guidelines provided by Dept. of Environment (DoE) of GoB. • Construction and demolition (C& D) wastes will be disposed of in designated waste disposal area. A STS(Secondary Transfer and storage depot will be constructed within CuEZL • Hazardous wastes will be disposed through local/ remote TSDF (Transfer Storage and Disposal Facilit). • Sewage will be treated in the proposed STP • Effluent of industries will be treated in ETP.
	Increase water turbidity due to run- off and erosion?	√		Temporary turbidity increase may happen after heavy rainfall but this is expected to

				for the short term and will be taken care of through river flow and erosion is unlikely.
	Waste water from camping sites to be directly discharged to the surface water resources or not?		√	No wastewater will be directly discharged to the surface water.

Sl. No	Screening Questions	Yes	No	Comments (In the case select "yes", provide detailed information)
	Construction waste directly discharged to the surface water?		√	Construction wastes will be managed as per best practice.
	Potential Community and Occupational Health and Safety Impacts			
6.	Will the project create major noise/vibration?	√		Noise and vibration will be created due to vehicular movement and construction activities. However, it will be temporary and necessary measures will be adopted to mitigate this problem.
7.	Will it create dust problem around the sites?	√		During construction, dust problem will be created. Besides this, vehicle movement, exhaust gas from vehicles, generators, boilers etc will create dust problem. However, it will be temporary and necessary measures will be adopted to mitigate this problem during construction phase.
8.	Will it temporarily stop the water supply and sanitation system?		√	The project proponent will run the Water supply and sanitation system continuously
9.	Will any refrigeration/air conditioning units be removed/ disposed?	√		Refrigeration and cooling units will be used in a substantial scale in the EZ. Some of the units will fail from time to time. The removing/ disposing of any refrigeration/air conditioning units will be done in environment friendly

				manner by minimizing CFC emission.
10.	Will any liquid waste, or an item containing liquids (including oils), need to be transported off-site for reuse, recycle or disposal?	√		Used machine oil would be refined into oil refineries and generated liquid wastes would be treated in wastewater treatment plants.
11.	Are explosive and hazardous chemicals used within the project?	√		No explosives and but some hazardous wastes will be produce which will disposed according to regulations.
12.	Will equipment containing polychlorinated biphenyls (PCB's) be removed (i.e. transformers, capacitors, hydraulic and heat transfer systems, etc.)?		√	PCB is a banned substance in Bangladesh and this will not be used.

Sl. No	Screening Questions	Yes	No	Comments (In the case select "yes", provide detailed information)
13.	In the past, there was any accident incurred due to landmines or explosive materials remaining from the war?		√	No previous records of such kind of accidents in the project area during construction work so far.
14.	Will project's construction cause disturbance to the transportation in the project's site?	√		Minor impact will be occurred due to traffic movement but this will be controlled by traffic management plan.
15.	Will building materials containing asbestos be removed/disposed?		√	No asbestos containing materials will be disposed of without proper treatment or following the environmental protocol. Unbound asbestos is banned but bound asbestos in the form of ABC (Asbestos Cement Sheet) may be used in some roofing applications, which pose less harm.
16.	Will any building materials be removed/disposed that are coated with lead based paint?		√	No building materials coated with lead-based paint will be disposed of without proper treatment or following the environmental protocol.

17.	Will any building materials be removed/disposed that contain lead, silver or chrome?		√	No building materials that contain lead, silver or chrome will be disposed of without proper treatment or following the environmental protocol.
18.	Will batteries be removed/disposed (lead-acid or nickel-cadmium batteries from emergency lights and other battery-powered or battery backup items?	√		Batteries will be disposed of by following the environmental protocol and waste management plan.
19.	Will mercury-containing devices (switches, gauges, thermostats) be removed/disposed?	√		These will be disposed of by following the environmental protocol and waste management plan.
20.	Will an emergency generator set or other aboveground storage tank (AST) be installed or removed?	√		The activity will be performed following environmental protocols and Occupational Health and Safety Plan.
21.	Will the workers be provided protective equipment, devices and clothing and be ensured those are used?	√		It will be managed following environmental protocols and Occupational Health and Safety Plan and adequate training will be provided.
22.	Will there be substantial migrant labor required? If so, what are the potential impacts on local communities?		√	Workers will be hired mostly from local areas. So, no potential impacts will occurr on local communities.

Sl. No	Screening Questions	Yes	No	Comments (In the case select "yes", provide detailed information)
23.	Is there any risk of disease dissemination from construction workers to the local peoples (and vice versa)?		√	As most workers will be hired locally, disease spread will be unlikely.
24.	Is there any potential for conflict between construction workers and local peoples (and vice versa)?		√	Local people will be employed as workers at the site, who will be well informed about the project by FGDs, KII etc. and thereby little possibilities will be there for such kind of issues.
	Potential Social Impacts			

25.	Permanent land acquisition	√		Land area is 246.3615 acres, which was mostly agricultural land. Land was acquired for the construction of infrastructures for the project according to BD law and WB PS.
26.	Temporary land acquisition		√	Not Applicable
27.	Impacts on livelihoods/ economic displacement?		√	The project will bring positive impacts on livelihood for the local people.
28.	Is there any household need to be relocated?		√	The project will be implemented within the proponent's own land. Therefore, no resettlement/ relocation issue will arise due to the project.
29.	Would the resettlement site be environmentally and/or culturally sensitive?		√	Since no resettlement will occur as the project will be on the proponent's own land, hence it is not applicable.
30.	Project's construction will cause any damage to the existing local roads system?		√	During construction, traffic movement will be increased at that area but it will not damage the existing roads
31.	Will soil excavation during project's construction cause soil erosion?	√		Minor soil erosion is likely to occur during project's construction activities.
32.	Will project need to open new access roads?		√	The site located nearby the existing road, so there is no need to construct a new access road for the project site.
Sl. No	Screening Questions	Yes	No	Comments (In the case select "yes", provide detailed information)
33.	Will project cause impact on air transportation?		√	The construction will be on a low height which will not hamper air transportation.

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(E) List of Environmentally and Socially Sensitive Activities

Sl. No	Screening Questions	Yes	No	Comments (In the case select "yes", provide detailed information)
1	Activities involving large-scale physical and/or economic displacement resulting from land related transactions defined in World Bank PS 5 (paragraph 5)[1]?		√	The project will be implemented within the proponent's own land. Therefore, no resettlement/ displacement issues will occur due to the project activity. No livelihood issues could be during public consultations. However, if complain surfaces in the future it will be dealt with through the grievance mechanism.
2	Activities in or near critical habitats and/or legally protected areas?		√	There is no critical habitat and/or legally protected areas.
3	Activities involving adverse impacts on tribal peoples and/or small ethnic communities?		√	There is no tribal peoples and/or small ethnic communities.
3	Activities involving significant adverse impacts on critical cultural heritage areas?		√	There is no cultural heritage site within the project area.

(F)	Chance Find Procedure
	In case of finding of properties of cultural value (such as monuments, works of art, archaeological sites, sites of religious significance etc.) during construction, Chance Find Procedures (OP 4.11) will be followed (Annex ii-d). The construction activities will be stopped in the area of chance find. The area will be delineated and secured to prevent any damage and the responsible authority and relevant ministry will be informed to take charge in protecting and preserving the site before deciding on subsequent appropriate procedures.

[1] Physical and/or economic displacement resulting from the following types of land-related transactions:

- Land rights or land use rights acquired through expropriation or other compulsory procedures in accordance with the legal system of the host country;

- Land rights or land use rights acquired through negotiated settlements with property owners or those with legal rights to the land if failure to reach settlement would have resulted in expropriation or other compulsory procedures;
- Project situations where involuntary restrictions on land use and access to natural resources cause a community or groups within a community to lose access to resource usage where they have traditional or recognizable usage rights;
- Certain project situations requiring evictions of people occupying land without formal, traditional, or recognizable usage rights; or
- Restriction on access to land or use of other resources including communal property and natural resources such as marine and aquatic resources, timber and non-timber forest products, freshwater, medicinal plants, hunting and gathering grounds and grazing and cropping areas.

(G)	Overall Assessment
	The overall Environmental and Social Risk of the project is moderate as the impacts and risks are mostly site specific and there are limited or insignificant impacts pertaining to land acquisition, change of landscape, impacts on biodiversity, environmental resources such as air, water, soil etc. The mitigation measures and action plan proposed in conformity with IPFF-II requirements would be sufficient to reduce risks and prevent ant potential negative impacts.

List of probable Industries at CEZL

Already Confirmed

1. Glass (Meghna Glass Industries Ltd.)
2. Re-rolling & steel Mills (Meghna Steel Re-rolling Mill Ltd.)

List of tentative industry to be established:

1. RMG & Textile
2. Food Processing
3. Vehicles & Parts Manufacturing
4. Leather Goods
5. Footwear
6. Plastic Articles
7. Machineries/Electronic Equipment/Light Engineering
8. Pharmaceuticals etc.
9. Beverage & Mineral Water
10. Packaging Film Industries
11. Tiles & Ceramic
12. IT Enabled Services
13. IT & Computer Related Equipment
14. Electronics Equipment & Assembling
15. Mobile, Telephone and Assembling
16. Plastic Products

Yousuf Ali FCMA
Chief Financial Officer

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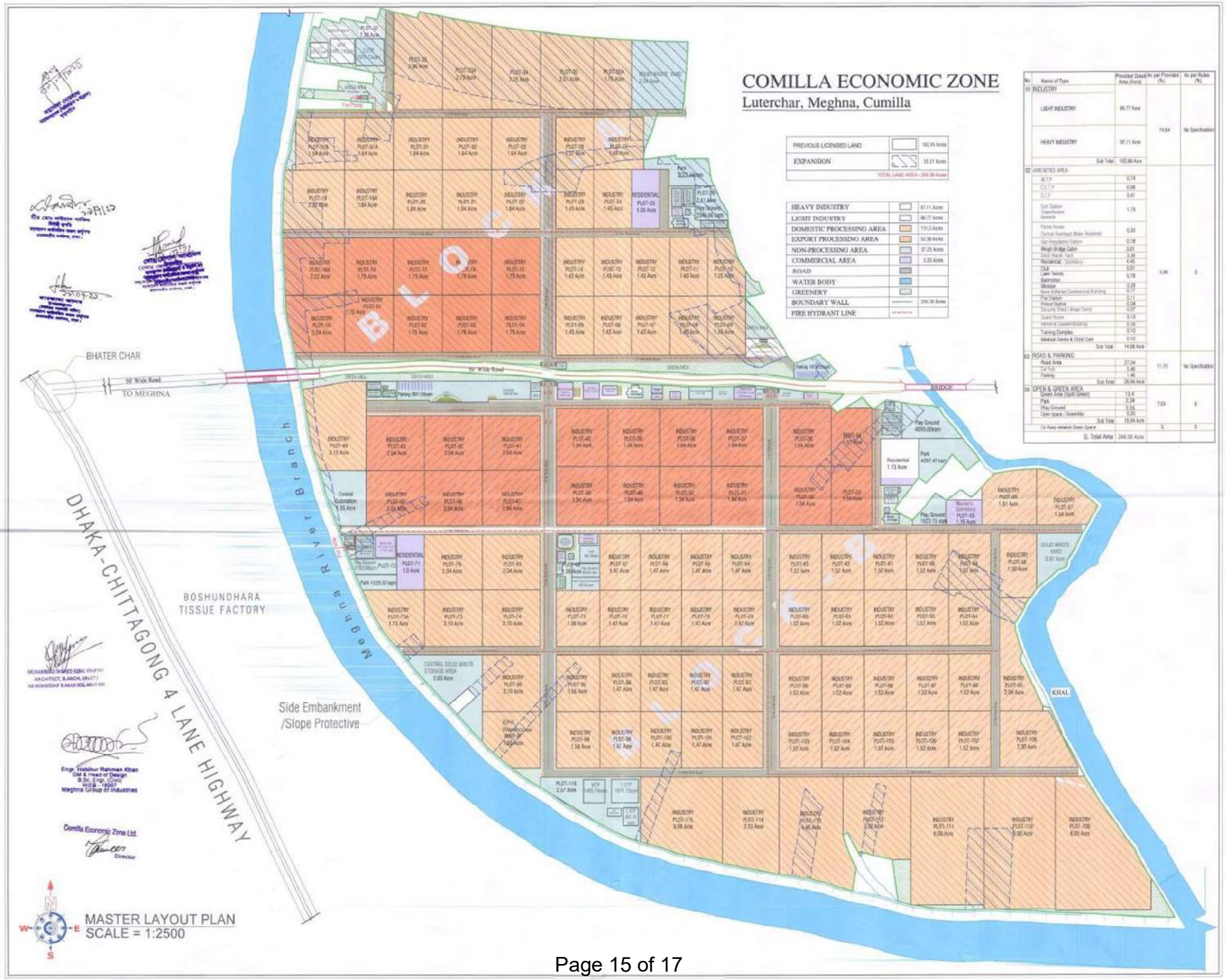
Email: info@mgi.org | Project: Sonachar, Meghna, Cumilla, Bangladesh


COMILLA ECONOMIC ZONE
Luterchar, Meghna, Cumilla
PREVIOUS LICENSED LAND
EXPANSION
HEAVY INDUSTRY
LIGHT INDUSTRY
DOMESTIC PROCESSING AREA
EXPORT PROCESSING AREA
NON-PROCESSING AREA
COMMERCIAL AREA
ROAD
WATER BODY
GREENERY
BOUNDARY WALL
FIRE HYDRANT LINE
BHATER CHAR
50' Wide Road
TO MEGHNA
BOSHUNDHARA
TISSUE FACTORY
DHAKA-CHITTAGONG 4 LANE HIGHWAY
Meghna River Branch
Side Embankment
/Slope Protective
KHAL
BRIDGE
Engr. Habibur Rahman Khan
GM & Head of Design
B.Sc. Engr. (Civil)
MIEB - 19007
Meghna Group of Industries
Comilla Economic Zone Ltd.
Director
MASTER LAYOUT PLAN
SCALE = 1:2500

Comilla Economic Zone Ltd.
Implementation Schedule
As on August 27, 2022

Particulars	Expected Start Date	Expected End Date	2019	2020	2021		2022				2023					Completion Status
			Dec-19	Dec-20	Jun-21	Dec-21	Mar-22	Jun-22	Sep-22	Dec-22	Mar-23	Jun-23	Sep-23	Nov-23	Dec-23	
Land Purchase	Already completed															100%
Land Filling & Development	Already completed															100%
Boundary Wall Construction	Jan-22	Jun-22														100%
Security Shed & Guard Room	Jul-22	Dec-22														33%
Main Gate	Feb-23	Nov-23														Not Started Yet
Internal Road Network Construction	Jun-22	Oct-23														5%
Gas Regulatory Station & Distribution Network	Jan-23	Nov-23														Not Started Yet
Water Distribution Network & Pump house	Jan-23	Nov-23														Not Started Yet
Water Treatment Plant	Jan-23	Nov-23														Not Started Yet
Firefighting System Including Hydrant	Dec-22	Nov-23														Not Started Yet
Power Distribution Network	Dec-22	Nov-23														Not Started Yet
Electric Substation & Distribution Network	Dec-22	Nov-23														Not Started Yet
Telecommunication system	Jul-23	Oct-23														Not Started Yet
Drainage System Construction	Jan-23	Nov-23														Not Started Yet
CETP	Jan-23	Oct-23														Not Started Yet
Sewerage Treatment Plant	Dec-22	Nov-23														Not Started Yet
Central Solid wage Management Area	Jan-23	Nov-23														Not Started Yet
Car parking hub including weigh bridge Cabin	Apr-23	Oct-23														Not Started Yet
Administrative Building	Jun-22	Nov-23														15%
Training Complex	Feb-23	Nov-23														Not Started Yet
Medical Centre and day care centre	Feb-23	Nov-23														Not Started Yet
Mosque	Jan-23	Nov-23														Not Started Yet
Fire station	Dec-22	Oct-23														Not Started Yet
Residential Building	Nov-22	Sep-23														Not Started Yet
Park & play ground	Oct-23	Nov-23														Not Started Yet
Commercial Operation	Dec-23	Dec-23														Not Started Yet

Yousuf Ali FCMA
Chief Financial Officer

Annex ii-d: Chance Find Procedures

(Ref: The World Bank Operational Manual, 1999 OP4.11)

Construction works could impact sites of social, sacred, religious, or heritage value. "Chance find" procedures would apply when those sites are identified during the design phase or construction period and the related activity will not be eligible for financing under the project.

(1) Cultural property includes monuments, structures, works of art, or sites of significant points of view, and are defined as sites and structures having archaeological, historical, architectural, or religious significance, and natural sites with cultural values. This includes cemeteries, graveyards and graves.

(2) The list of negative subproject attributes which would make a subproject ineligible for support includes any activity that would adversely impact cultural property.

(3) In the event of finding properties of cultural value during construction, the following procedures for identification, protection from theft, and treatment of discovered artifacts should be followed and included in standard bidding documents.

   (a) Stop the construction activities in the area of the chance find;
   (b) Delineate the discovered site or area;
   (c) Secure the site to prevent any damage or loss of removable objects.
   (d) Notify the supervisory Engineer who in turn will notify the responsible local authorities;
   (e) Responsible local authorities and the relevant Ministry would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures (in this case, Department of Archeology Bangladesh).
   (f) Decisions on how to handle the finding shall be taken by the responsible authorities and the relevant Ministry. This could include changes in the layout (such as when finding an irremovable remain of cultural or archeological importance), conservation, restoration and salvage.
   (g) Implementation of the authority decision concerning the management of the finding shall be communicated in writing by the relevant Ministry.
   (h) Construction work could resume only after permission is given from the responsible local authorities and the relevant Ministry concerning safeguard of the heritage.

(4) These procedures must be referred to as standard provisions in construction contracts. During project supervision, the Site Engineer shall monitor the above regulations relating to the treatment of any chance find encountered.

(5) Relevant findings will be recorded in World Bank Monitoring and Supervision Reports during project implementation. Completion Reports will assess the overall effectiveness of the project's cultural property mitigation, management, and activities, as appropriate.

ANNEX A
LAYOUT

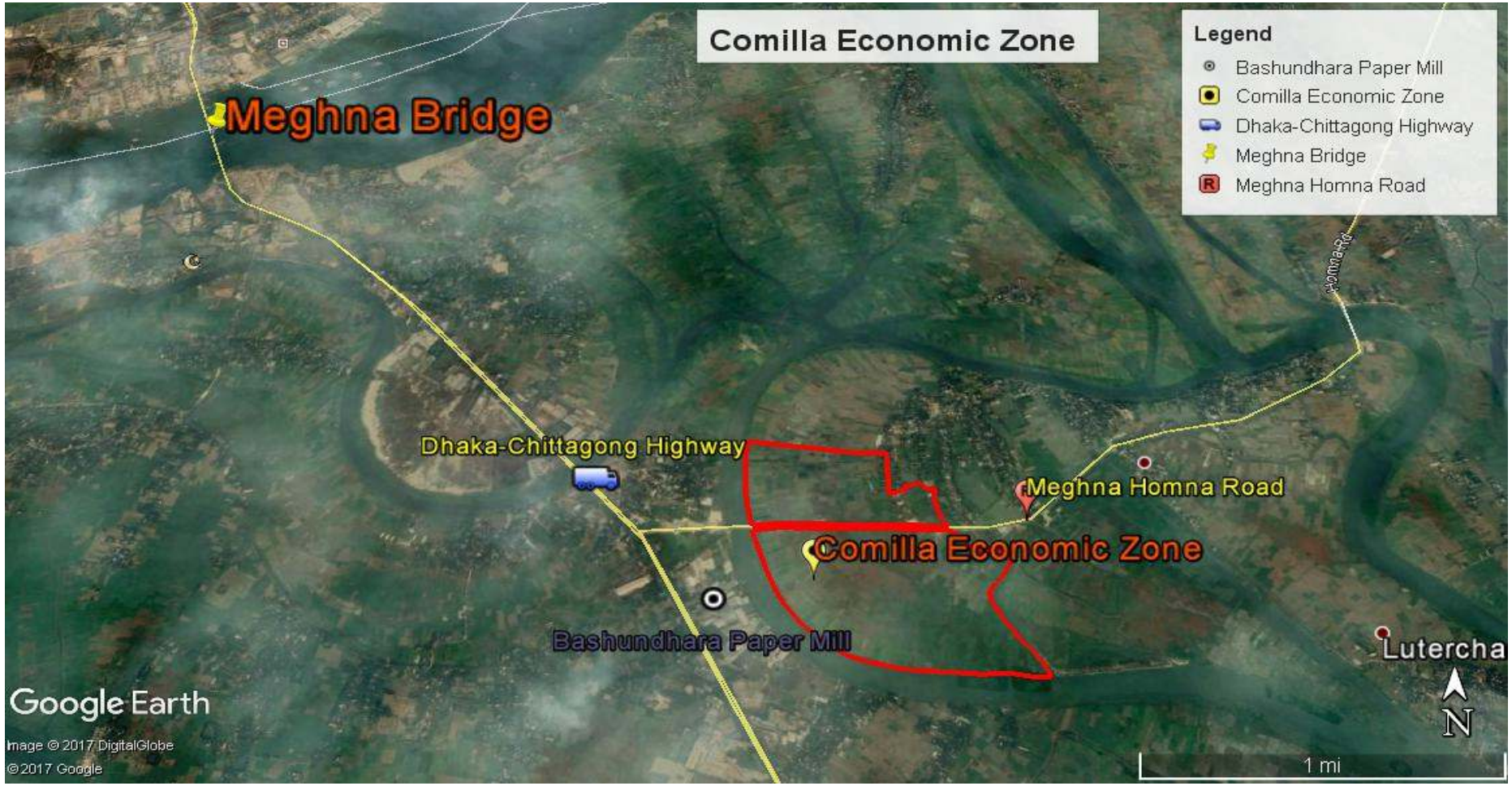


Figure A1: Location Map of Cumilla Economic Zone Limited from Google map.

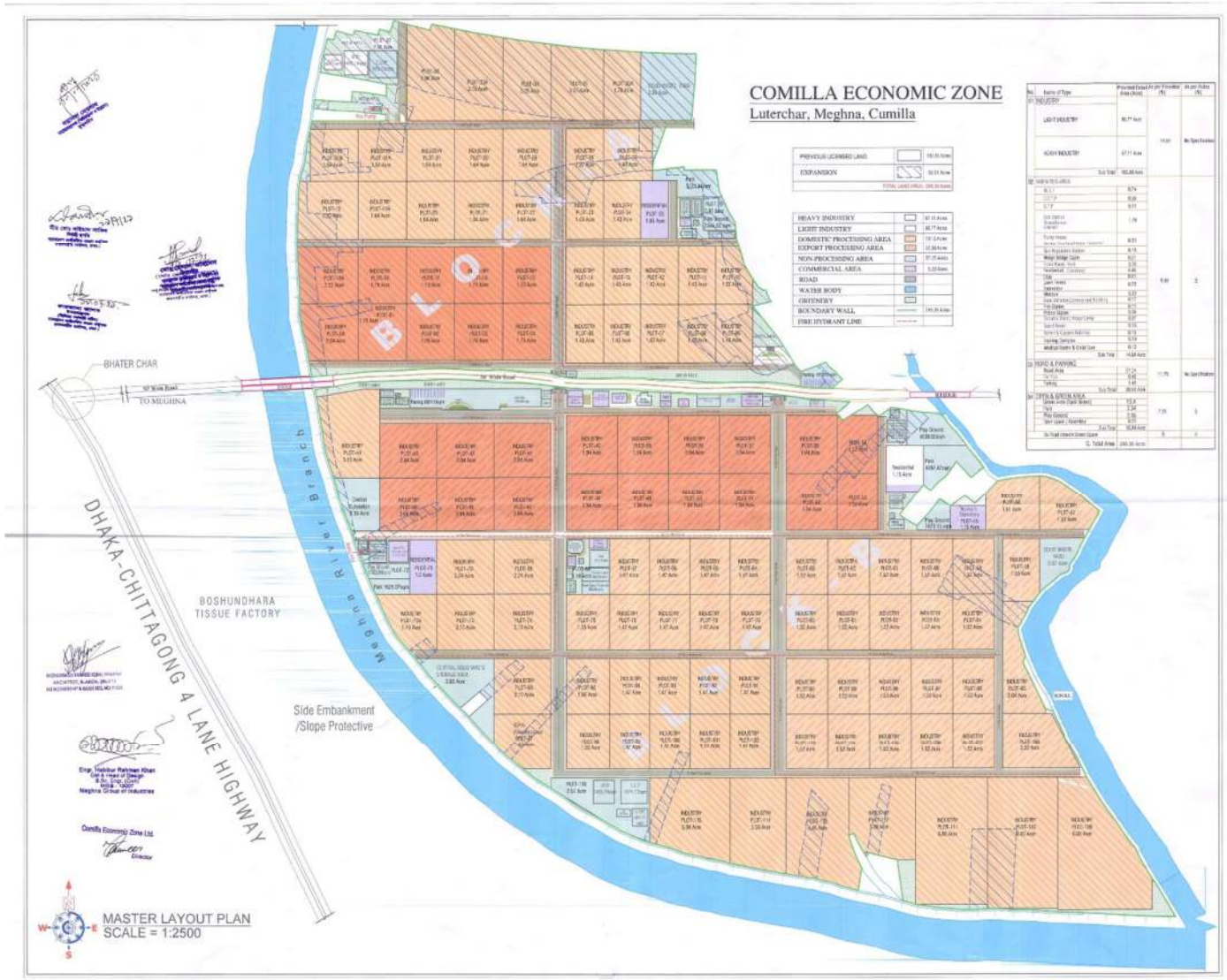

COMILLA ECONOMIC ZONE
Luterchar, Meghna, Cumilla
BHATER CHAR
TO MEGHNA
DHAKA-CHITTAGONG 4 LANE HIGHWAY
BOSHUNDHARA TISSUE FACTORY
Side Embankment /Slope Protective
Meghna River Branch
MASTER LAYOUT PLAN
SCALE = 1:2500

Figure A2: Master Layout Plan of the CuEZL Project

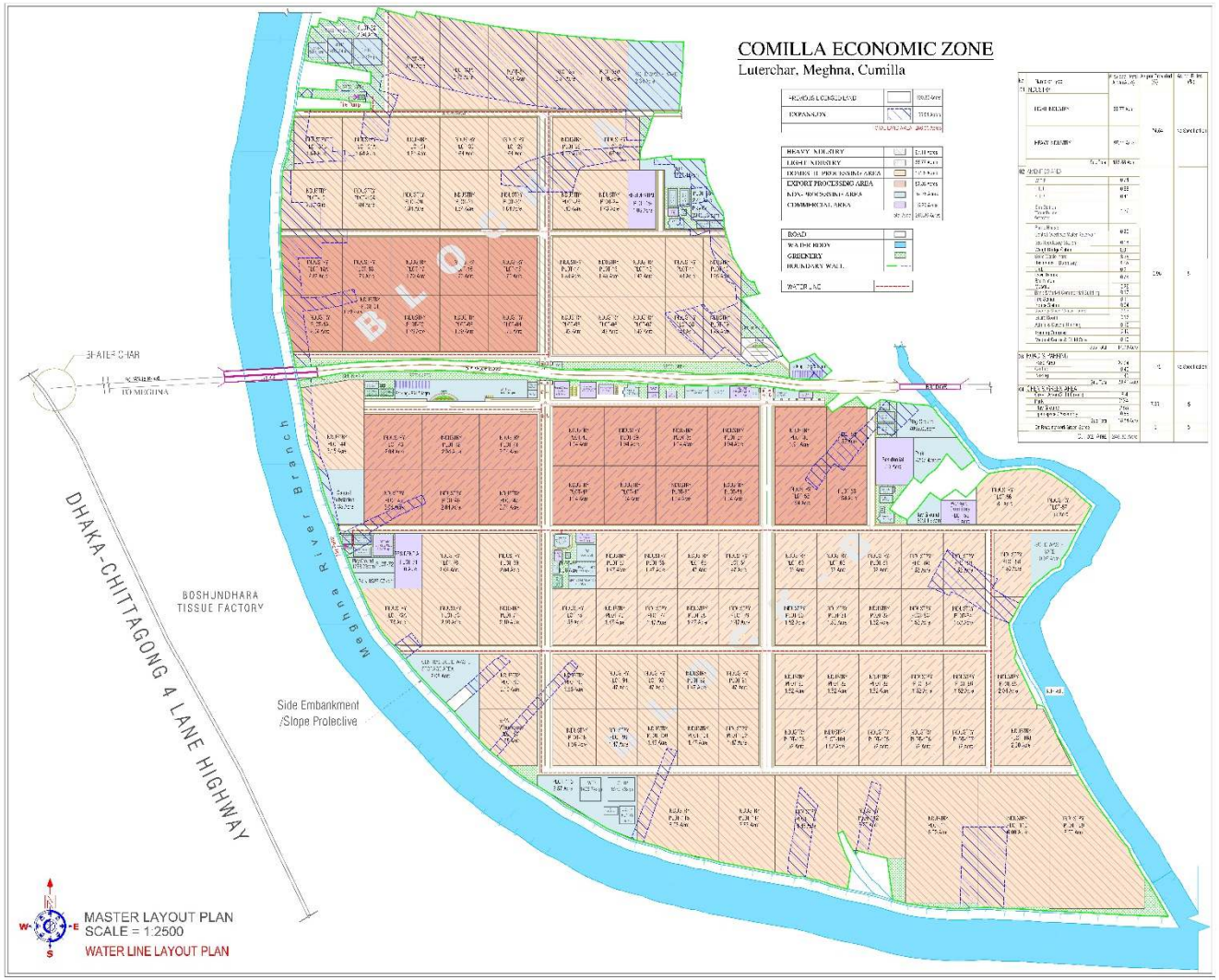


Figure A3: Water Supply Network Layout Plan of the CuEZL Project

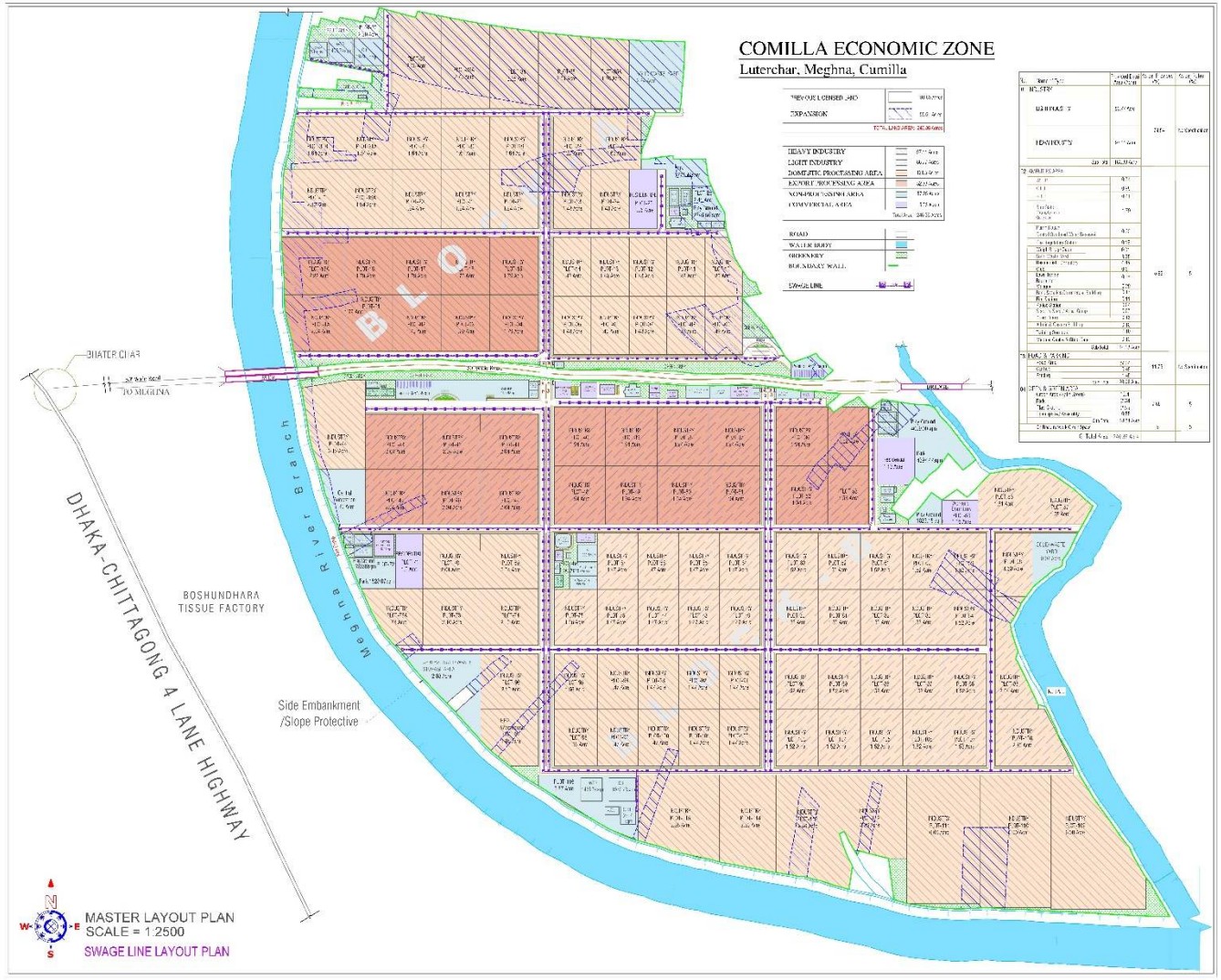


Figure A4: Sewage Line Network Layout Plan of the CuEZL Project

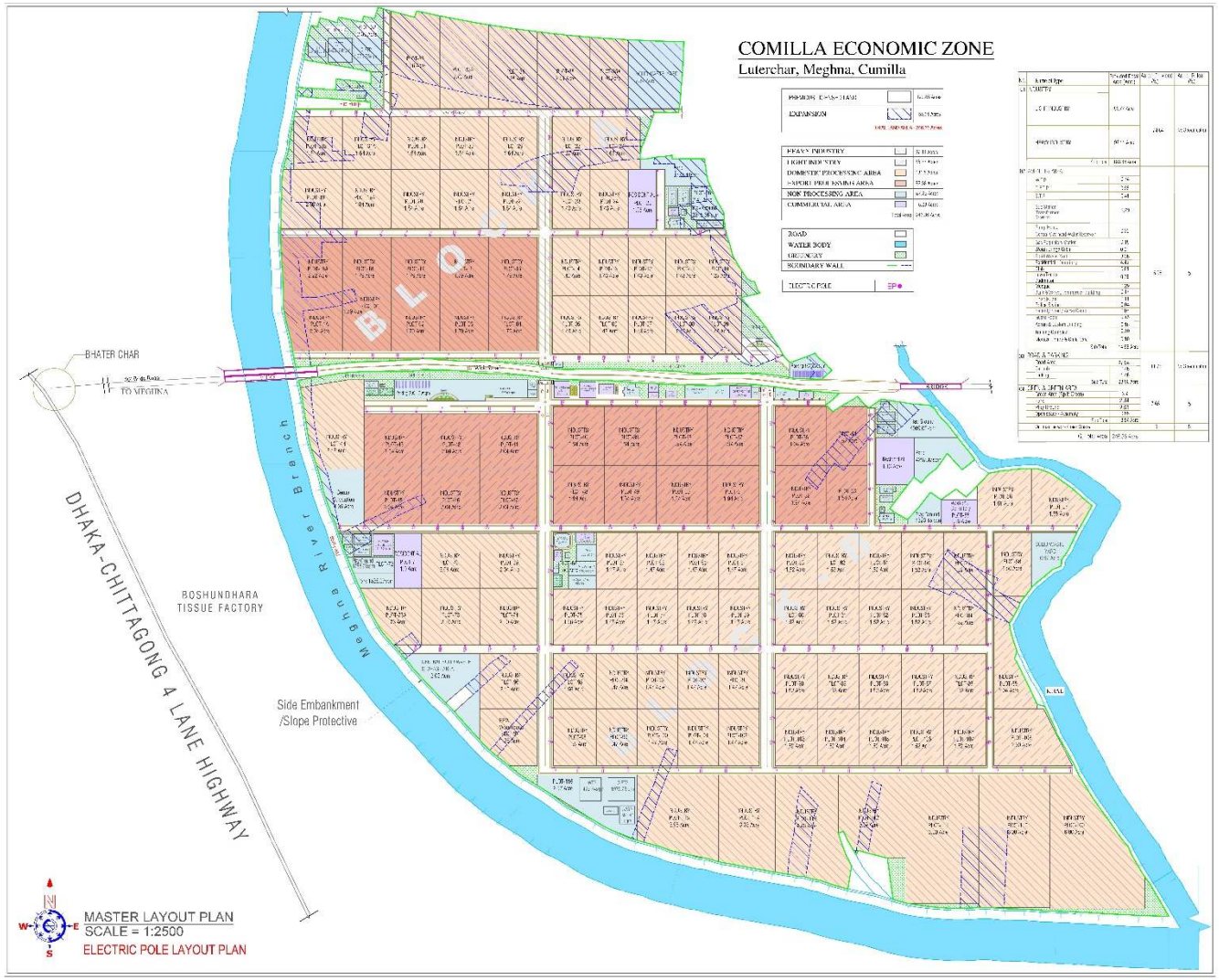


Figure A5: Electric Pole Layout Plan of the CuEZL Project

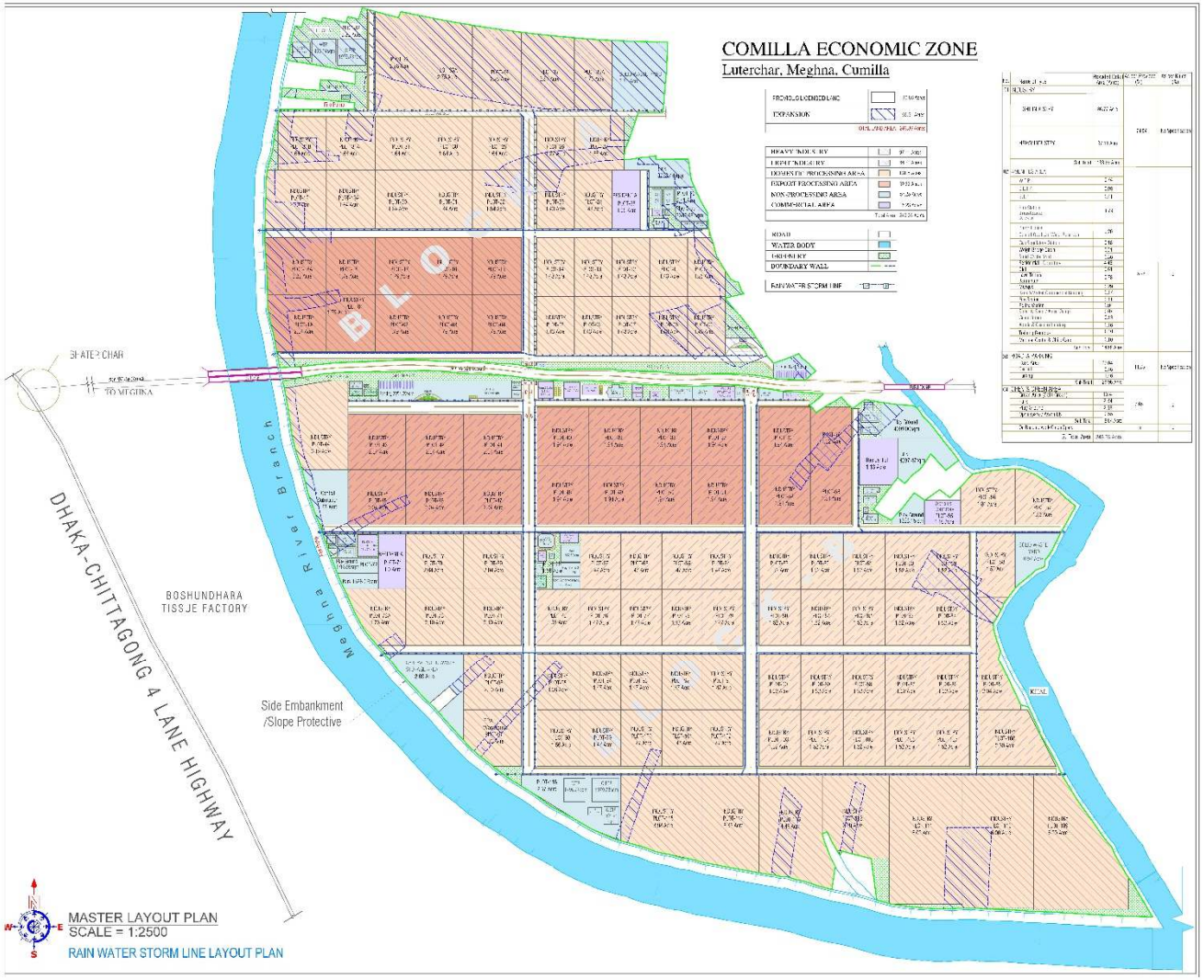


Figure A6: Storm Line Layout Plan of the CuEZL Project

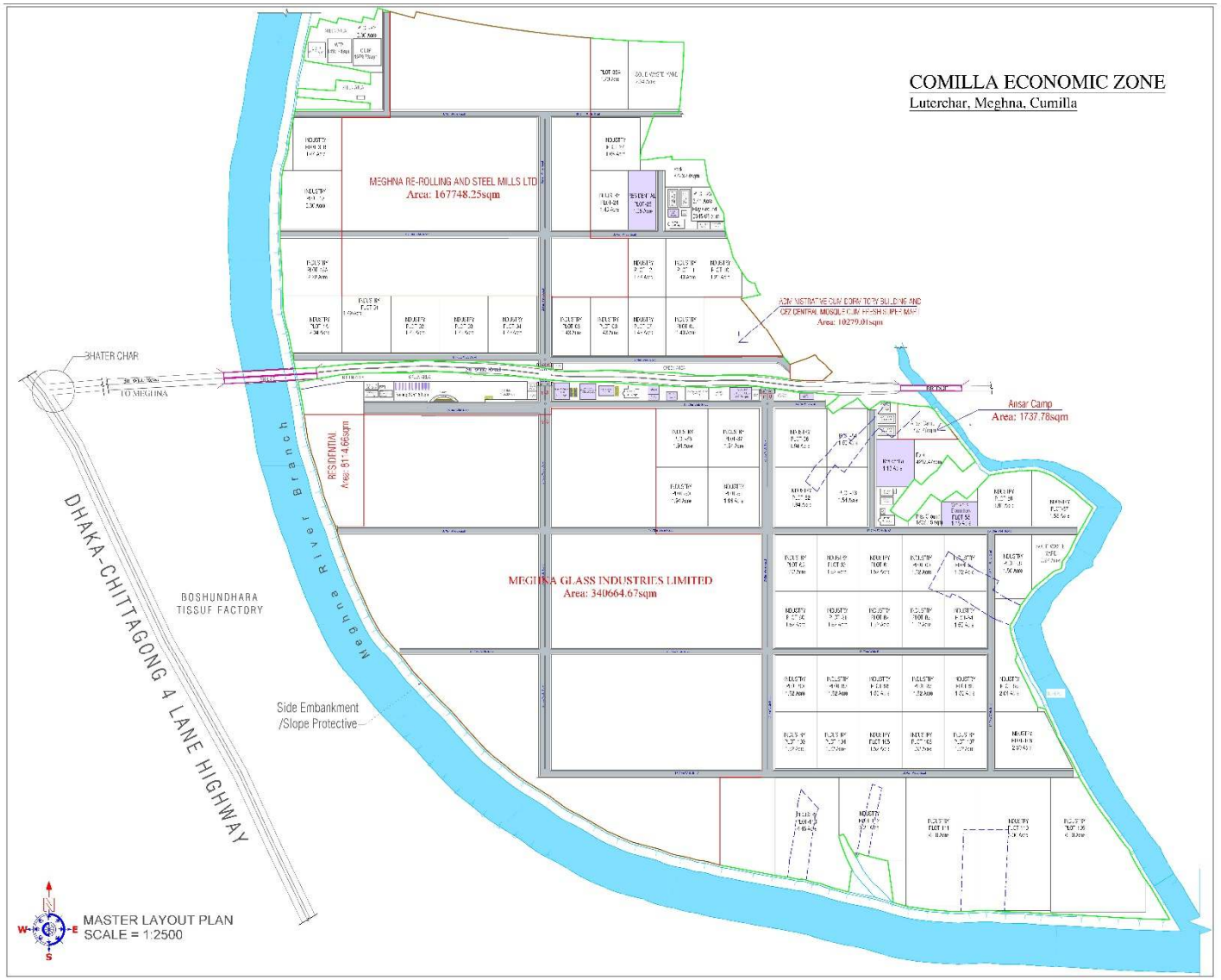


Figure A7: Layout Plan of the CuEZL Project showing the location of major industries

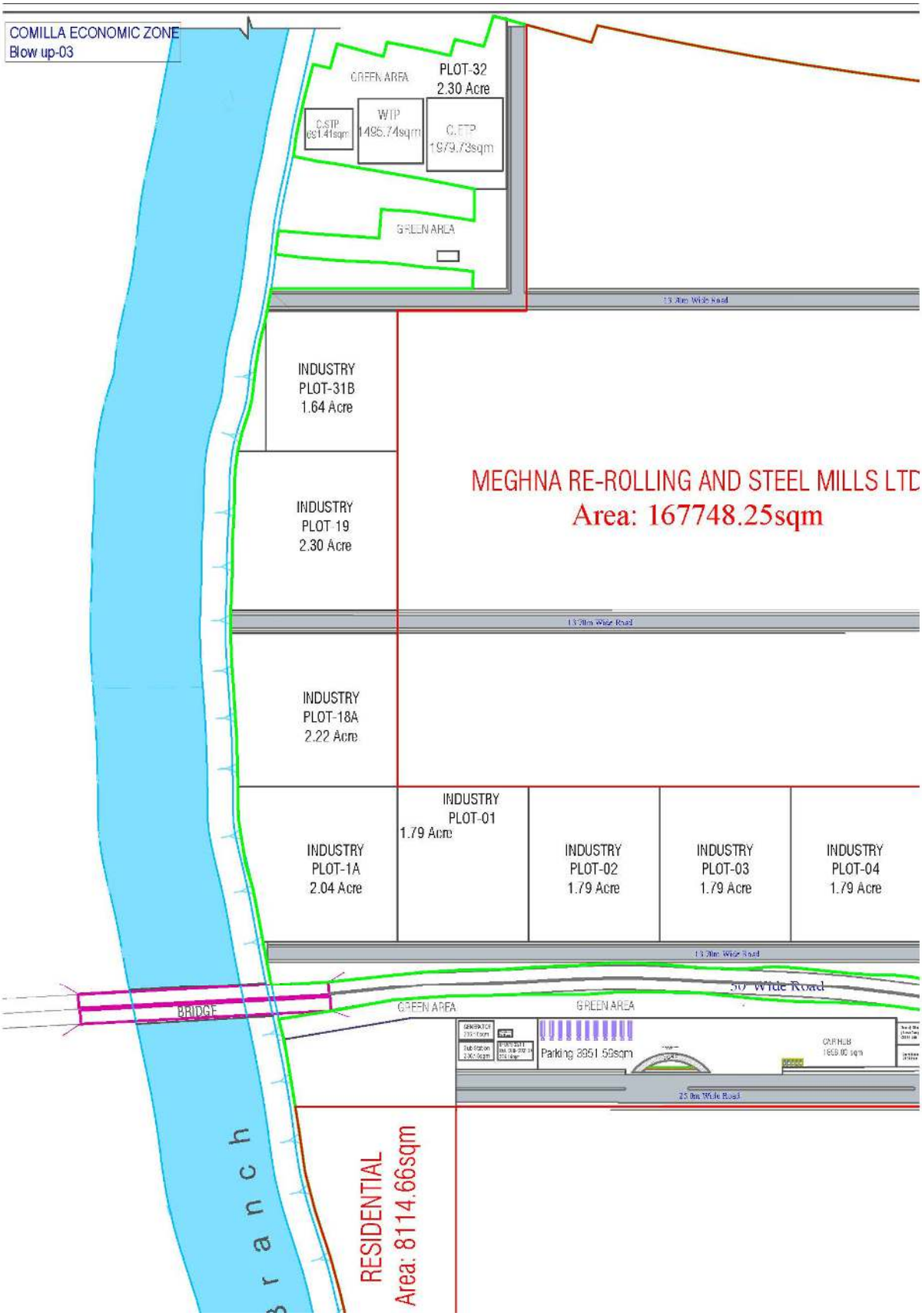


Figure A6: Layout Plan of the CuEZL Project showing the location of WTP, CETP, and STP

Figure A6: Layout Plan of the CuEZL Project showing the location of Solid waste yard - 1

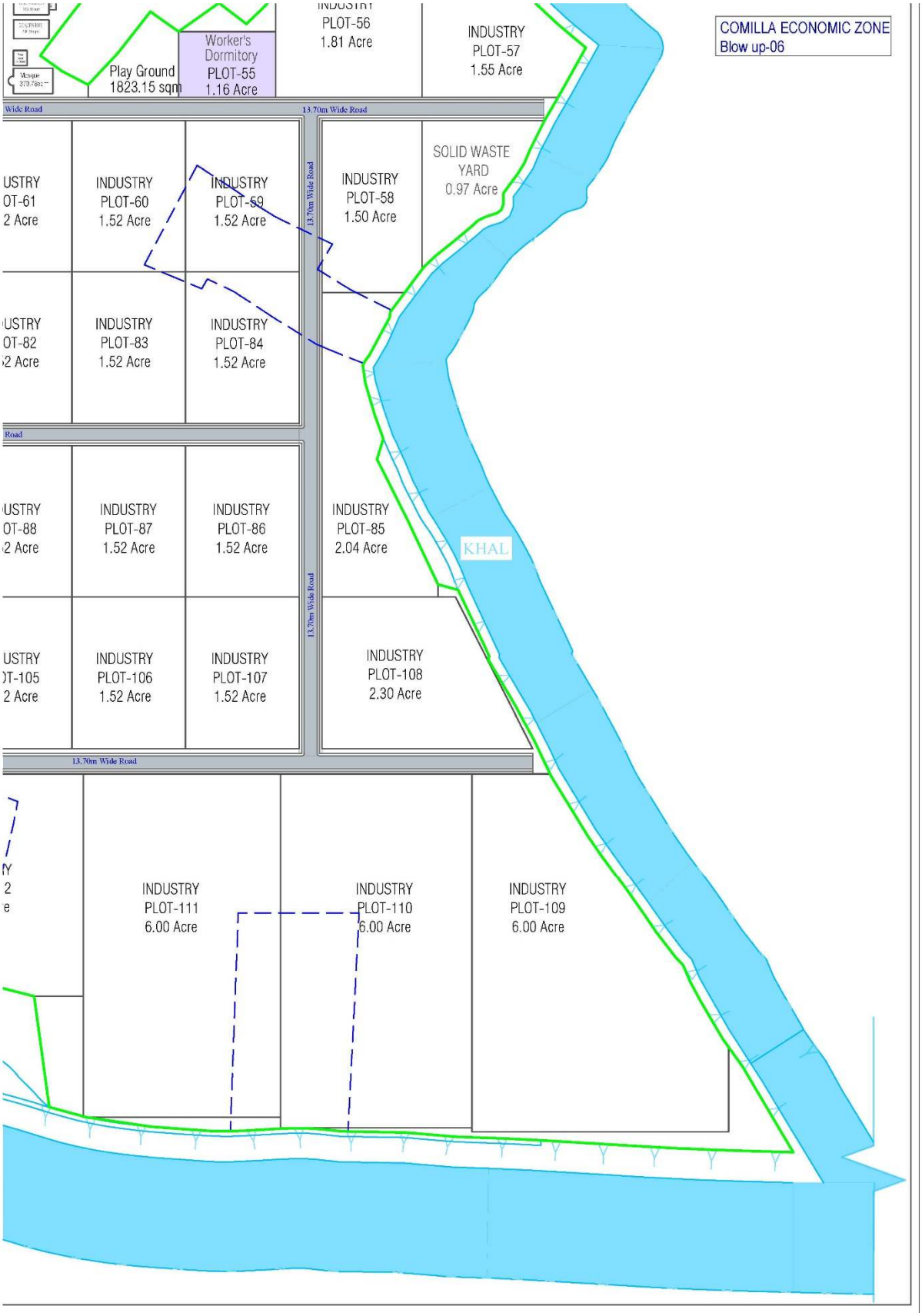


Figure A6: Layout Plan of the CuEZL Project showing the location of Solid waste yard - 2

Table A1: Implement Status of various components of CuEZL Project

Comilla Economic Zone Ltd.
Implementation Schedule
As on August 27, 2022

Particulars	Expected Start Date	Expected End Date	2019	2020	2021		2022				2023					Completion Status
			Dec-19	Dec-20	Jun-21	Dec-21	Mar-22	Jun-22	Sep-22	Dec-22	Mar-23	Jun-23	Sep-23	Nov-23	Dec-23	
Land Purchase	Already completed															100%
Land Filling & Development	Already completed															100%
Boundary Wall Construction	Jan-22	Jun-22														100%
Security Shed & Guard Room	Jul-22	Dec-22														33%
Main Gate	Feb-23	Nov-23														Not Started Yet
Internal Road Network Construction	Jun-22	Oct-23														5%
Gas Regulatory Station & Distribution Network	Jan-23	Nov-23														Not Started Yet
Water Distribution Network & Pump house	Jan-23	Nov-23														Not Started Yet
Water Treatment Plant	Jan-23	Nov-23														Not Started Yet
Firefighting System Including Hydrant	Dec-22	Nov-23														Not Started Yet
Power Distribution Network	Dec-22	Nov-23														Not Started Yet
Electric Substation & Distribution Network	Dec-22	Nov-23														Not Started Yet
Telecommunication system	Jul-23	Oct-23														Not Started Yet
Drainage System Construction	Jan-23	Nov-23														Not Started Yet
CETP	Jan-23	Oct-23														Not Started Yet
Sewerage Treatment Plant	Dec-22	Nov-23														Not Started Yet
Central Solid wage Management Area	Jan-23	Nov-23														Not Started Yet
Car parking hub including weigh bridge Cabin	*Apr-23*	*Oct-23*														*Not Started Yet*
Administrative Building	Jun-22	Nov-23														15%
Training Complex	Feb-23	Nov-23														Not Started Yet
Medical Centre and day care centre	Feb-23	Nov-23														Not Started Yet
Mosque	Jan-23	Nov-23														Not Started Yet
Fire station	Dec-22	Oct-23														Not Started Yet
Residential Building	Nov-22	Sep-23														Not Started Yet
Park & play ground	Oct-23	Nov-23														Not Started Yet
Commercial Operation	Dec-23	Dec-23														Not Started Yet

ANNEX B
BASELINE ENVIRONMENT

B.1 INTRODUCTION

As a part of the environmental assessment of the proposed "Cumilla Economic Zone Limited" (CuEZL) project, an environmental baseline surveys were carried out in areas surrounding the proposed location May 2019 as well as in August 2022. The specific objectives of the baseline study were:

- To document the existing condition of physical and biological environment and prevailing socio-economic condition of the project areas;
- To identify the significant environmental and social aspects that are likely to be affected by the proposed project activities; and
- Setting of baseline parameters in order to identify possible adverse and beneficial impacts due to the proposed project activities.

This Chapter describes the baseline physical, biological and social environment of project areas based on the findings of the baseline surveys.

B.2 PHYSICAL ENVIRONMENT

B.2.1 Physical Features of the Study Area

Cumilla Economic Zone Limited located at Sonachar Mauza, Luterchar Union, Meghna Upazila, Cumilla District under Chittagong Division. It is beside Dhaka-Chittagong Highway. So far CuEZL received pre-qualification license for 102.58 Acres but they have already purchased a total of 240.3615 acres of lands for this purpose. This area will be developed with the aim to establish non-polluting industries. At present CuEZL intends to develop on-site and off-site facilities for the EZ so that "ready to develop" land is available for industrialist and investors for establishing industries

Of the total land area of 110 acres, 60% can be used as industrial area with the rest being allocated for communal facilities including internal roads and utilities. Of the 60% industrial area, 80% would be leased out as land and the rest 20% would be rented out as floor space.

Figure B.1 shows important physical features of the proposed project site. The physical features are divided into 2 Boxes and Figure B.2 to Figure B.3 shows physical features within each Box.

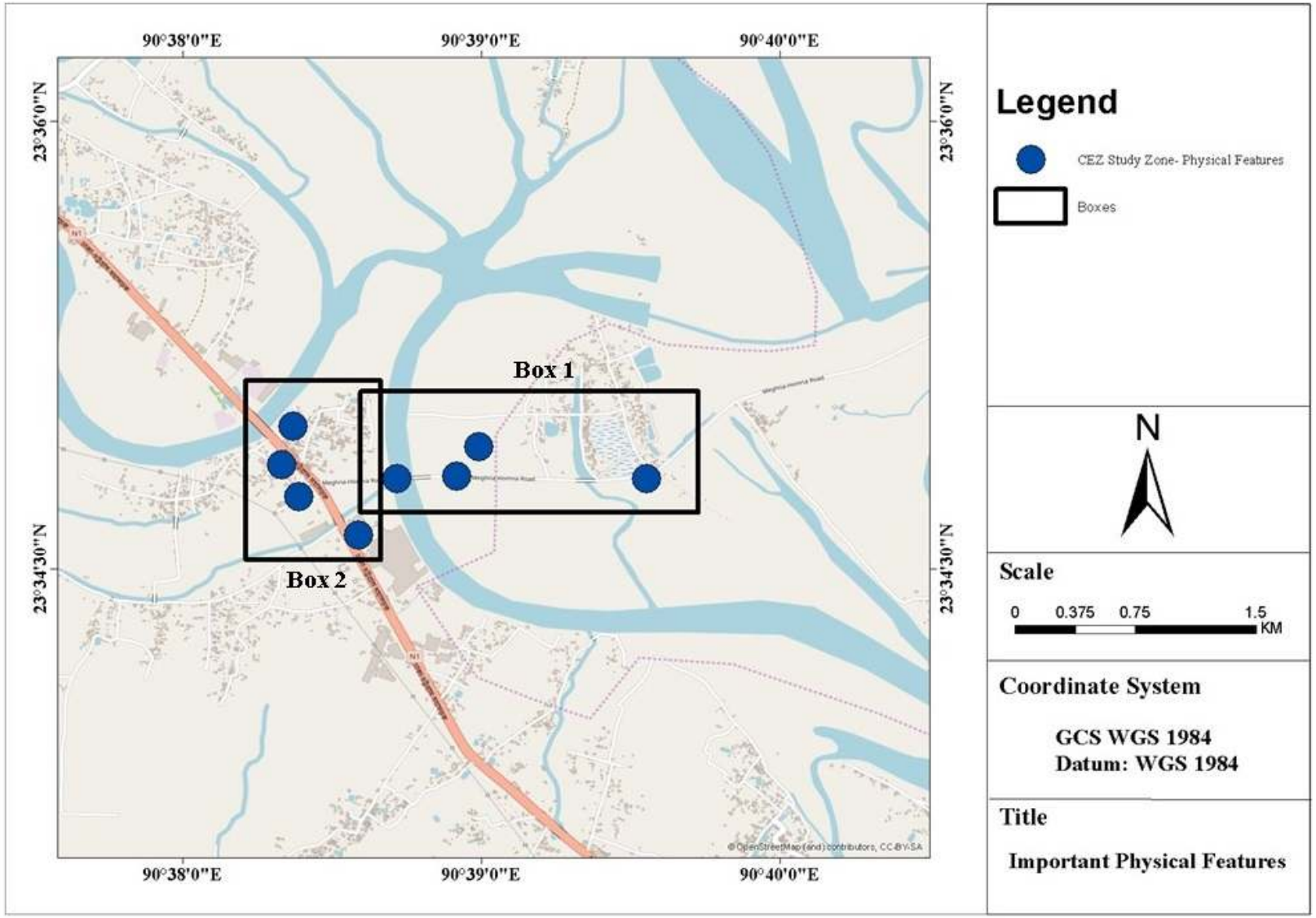


Figure B.1: Important physical features of the proposed project site, divided into 2 Boxes.

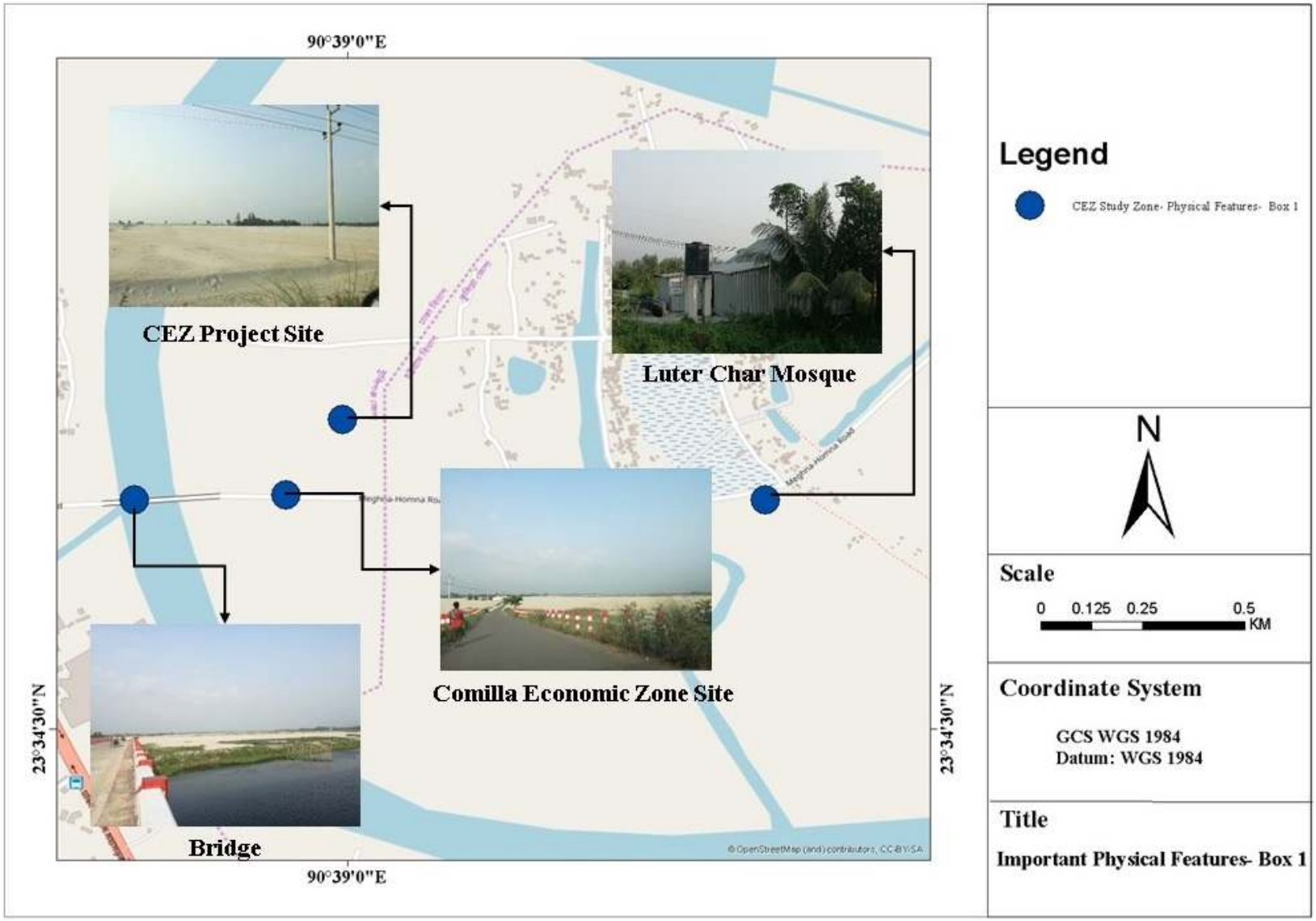


Figure B.2: Important physical features of the proposed project site within Box 1.

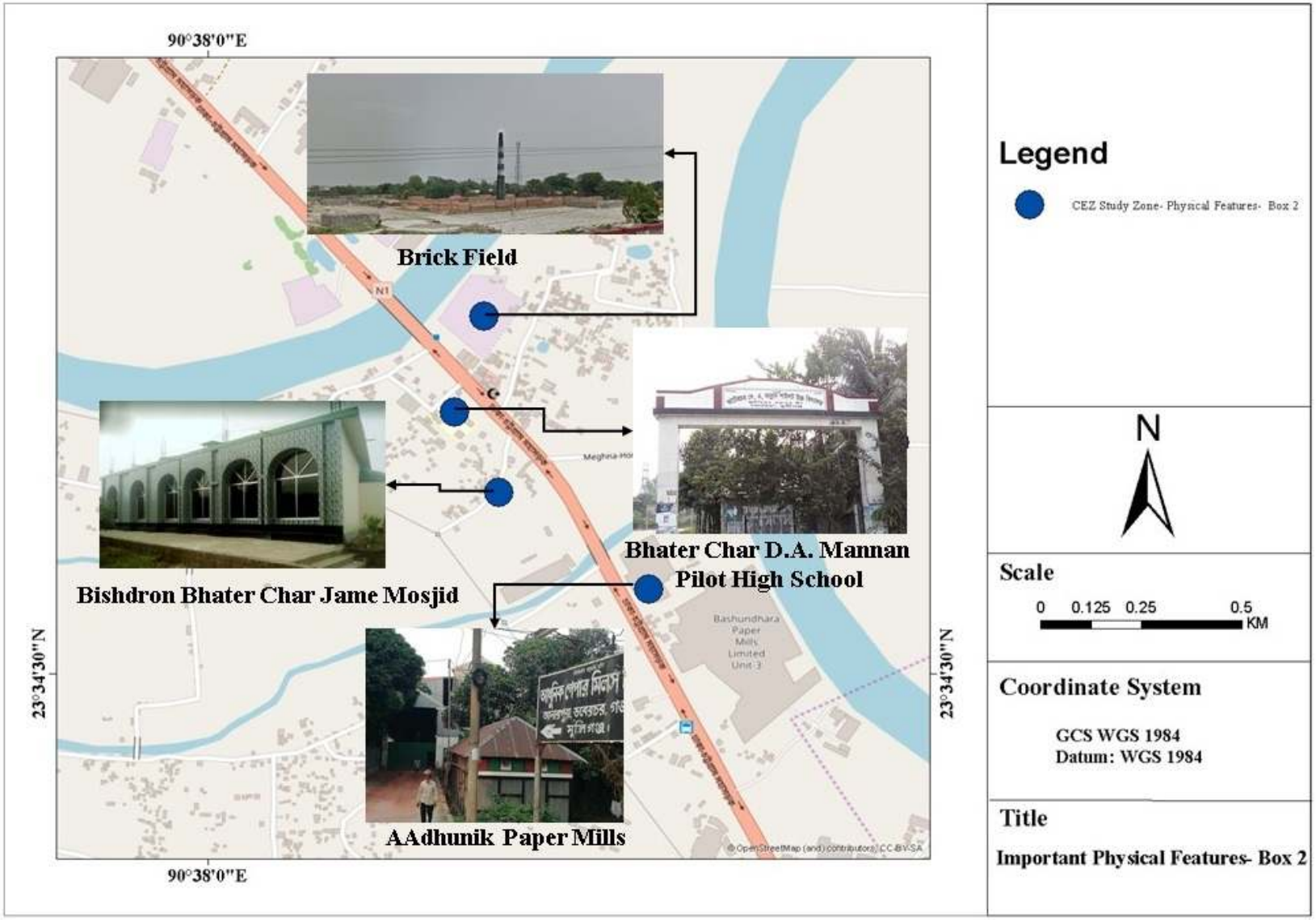


Figure B.3: Important physical features of the proposed project site within Box 2.

B.2.2 Archaeological Sites

Bangladesh is considerably rich in archaeological wealth, especially of the medieval period both during the Muslim and pre-Muslim rules, though most of it is still unexplored and unknown. No archeological site was found near the vicinity of the proposed project site.

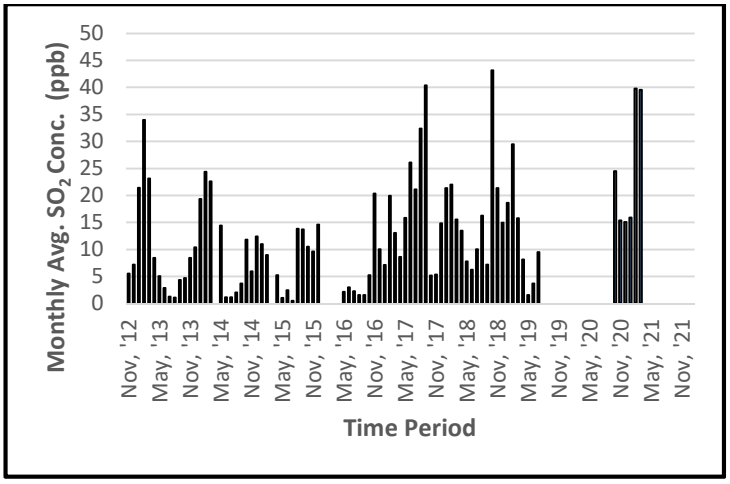
B.3 PHYSICO- CHEMICAL ENVIRONMENT

B.3.1 Air Quality

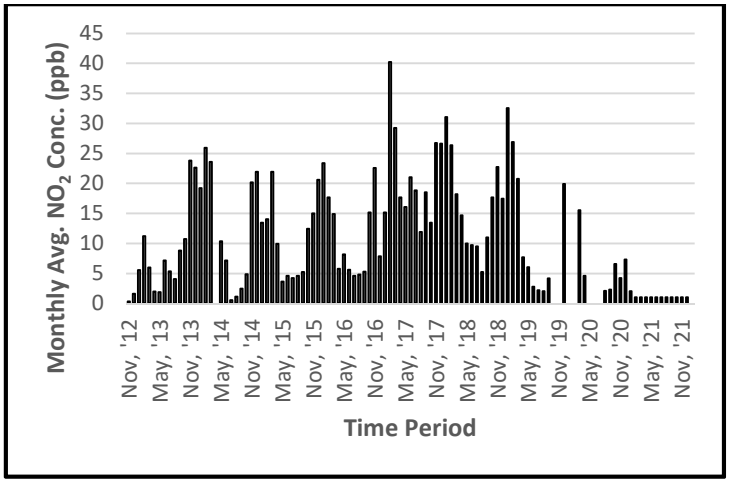
The Clean Air and Sustainable Environment (CASE) Project, under the Ministry of Environment and Forest, Government of the People's Republic of Bangladesh, monitors different ambient air quality parameters from 11 fixed continuous air monitoring stations (CAMS) located in different parts of the country. Among these CAMS, the nearest station of the proposed project site is CAMS- 5, hence the data well represent the proposed project site ambient air quality (Table B.1). Different ambient air quality data like PM_{10}, $PM_{2.5}$, SO_2, NO, NO_2, NOx, CO, 8-hr average CO, O_3 and 8-hr average O_3 measured monthly in these CAMS during the Months of 2012 to 2022 are summarized in Figure B.4 (a) to (j), which are compared with the Bangladesh Ambient Air Quality Standards and WHO Ambient Air Quality Guidelines for assessing the overall situation of the ambient air quality. Table B.2 outlines the National Ambient Air Quality Standards for Bangladesh.

Table B.1: The continuous air monitoring stations (CAMS) representing the locations visited in this study.

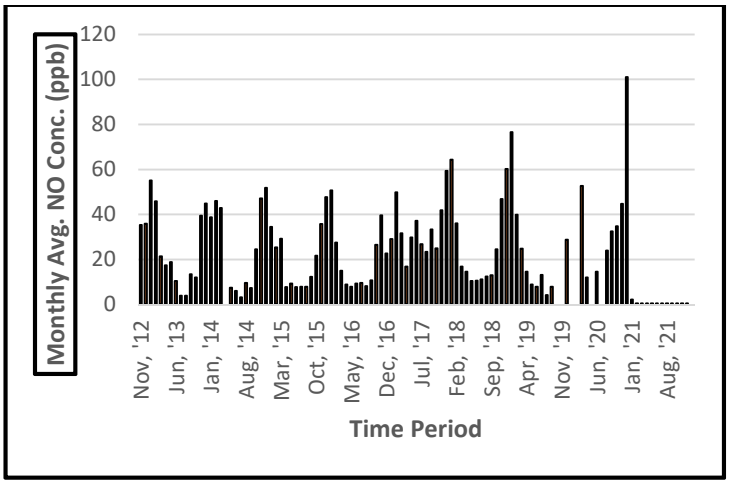
CAMS					
City	ID	Location	Latitude	Longitude	Monitoring Capacity
Narayanganj	CAMS-5	Narayanganj	23.63ºN	90.51ºE	PM10, PM2.5, SO2, NO, NO_2, NO_X, CO, and O_3 with meteorological parameters.


Monthly Avg. SO_2 Conc. (ppb)
Time Period

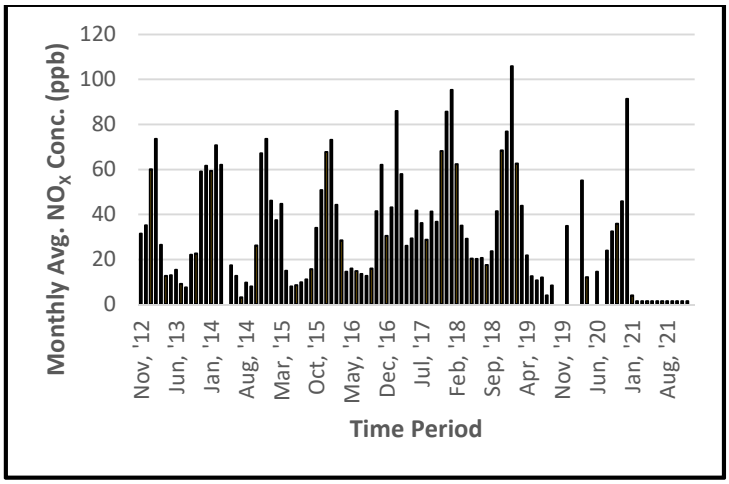
(a)


Monthly Avg. NO_2 Conc. (ppb)
Time Period

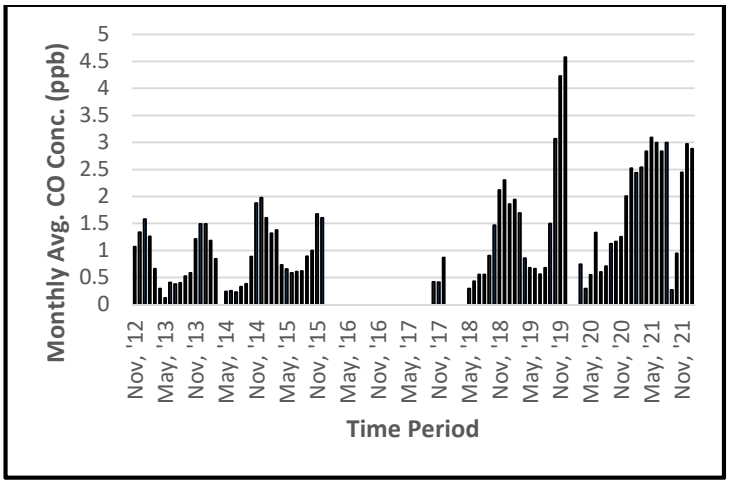
(b)


Monthly Avg. NO Conc. (ppb)
Time Period

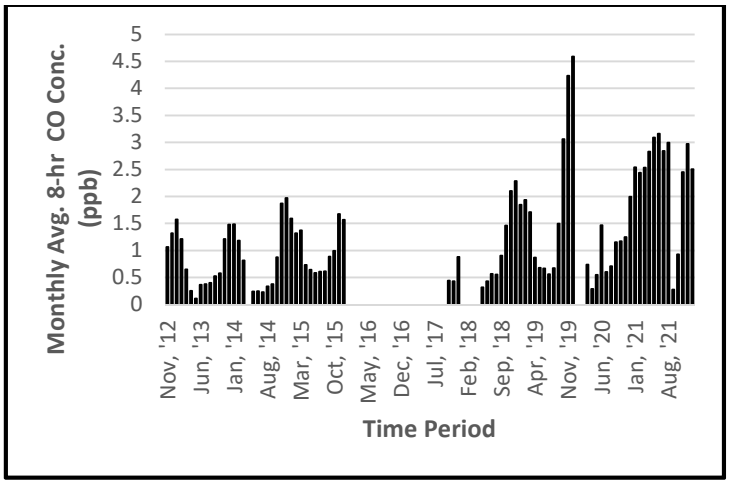
(c)


Monthly Avg. NO_X Conc. (ppb)
Time Period

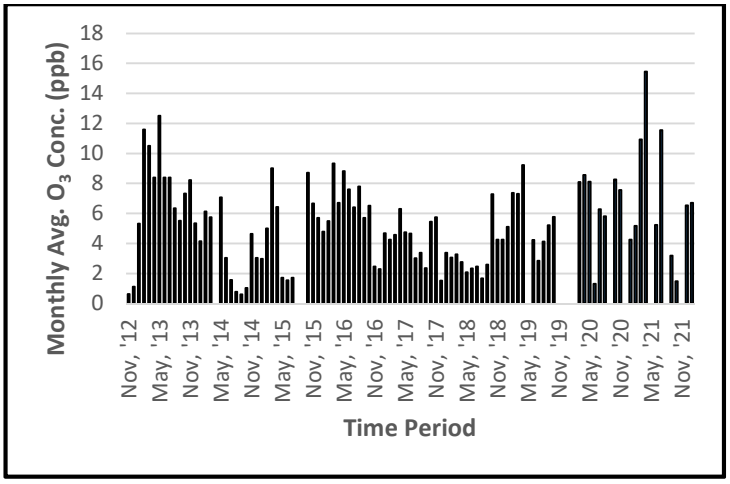
(d)


Monthly Avg. CO Conc. (ppb)
Time Period

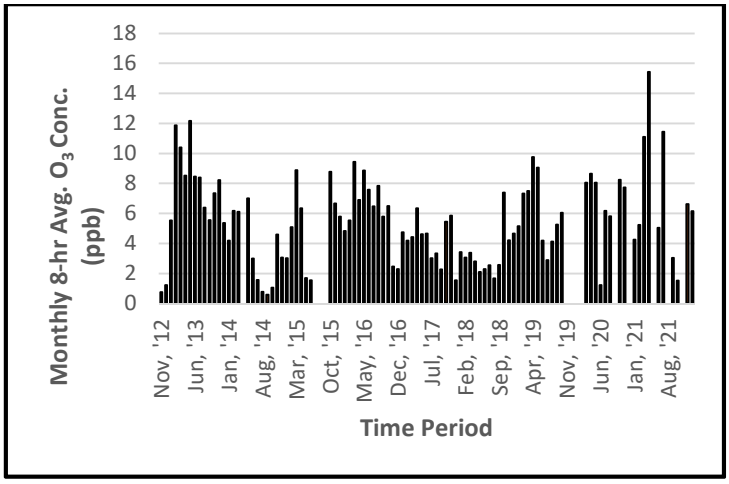
(e)


Monthly Avg. 8-hr CO Conc. (ppb)
Time Period

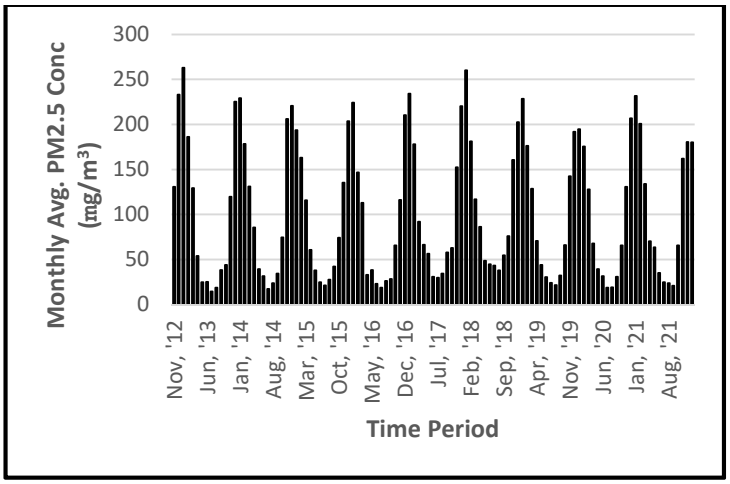
(f)


Monthly Avg. O_3 Conc. (ppb)
Time Period

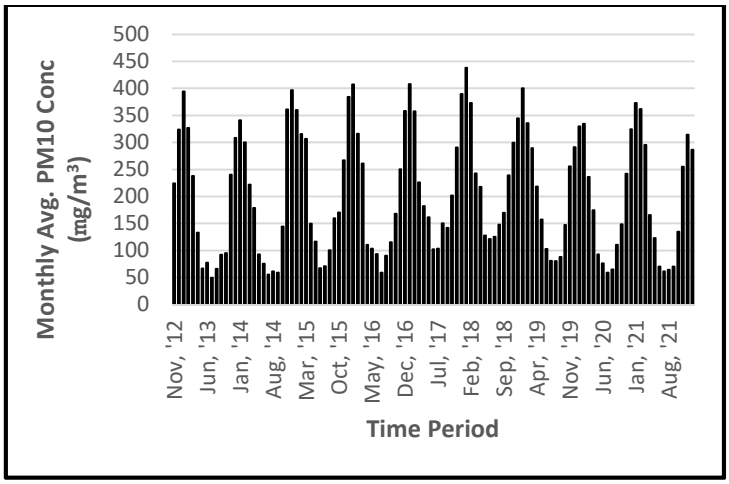
(g)


Monthly 8-hr Avg. O_3 Conc. (ppb)
Time Period

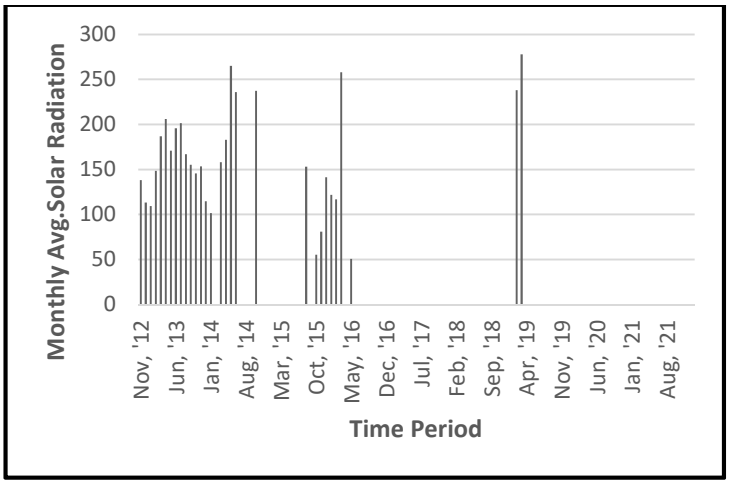
(h)


Monthly Avg. PM2.5 Conc (mg/m³)
Time Period

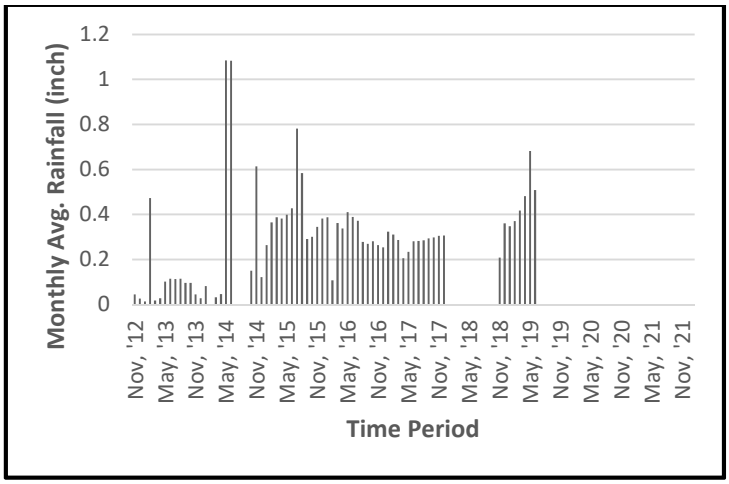
(i)


Monthly Avg. PM10 Conc (mg/m³)
Time Period

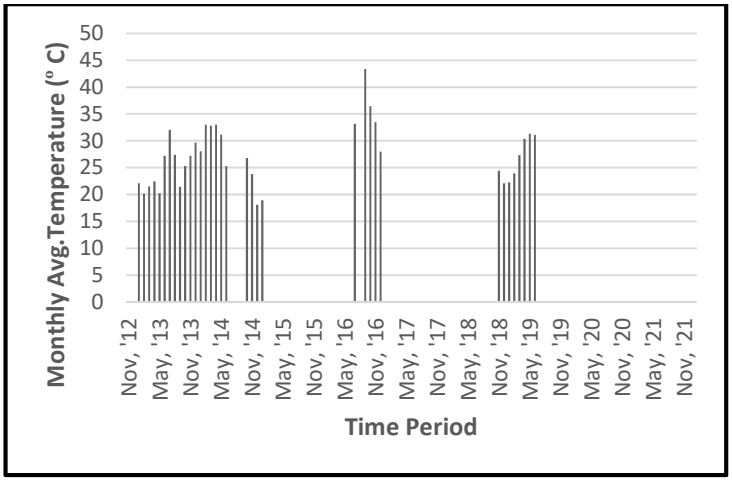
(j)


Monthly Avg.Solar Radiation
Time Period

(k)


Monthly Avg. Rainfall (inch)
Time Period

(l)



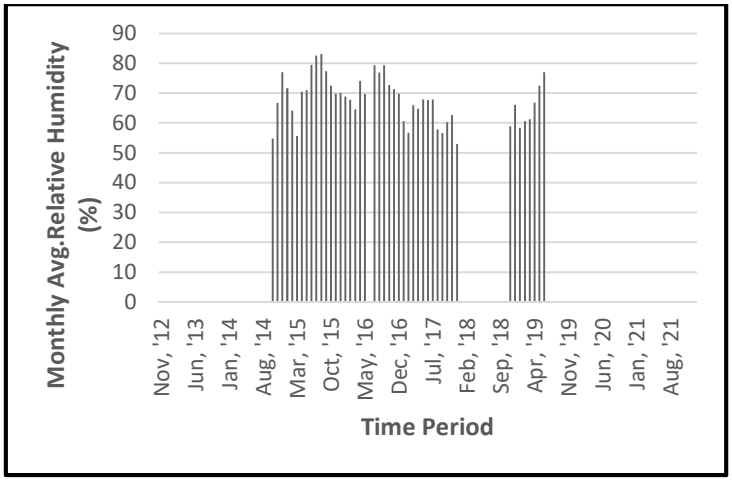


Figure B.4: Monthly air quality and Meteorological monitoring data from the CAMS-5 located at Narayanganj for the monthly period of year 2012 and 2022. The air quality parameters monitored are: (a) SO_2, (b) NO_2,(c) NO, (d) NO_x, (e) CO, (f) CO-8hr, (g) O_3-1hr, (h) O_3-8hr, (i) $PM_{2.5}$, (j) PM_{10}, (k) Solar Radiation, (l) Rainfall, (m) Temperature and (n) Relative Humidity

Table B.2: National Ambient Air Quality Standards for Bangladesh as per Air Pollution Control Rules, 2022

Pollutant	**Objective**	**Average**
CO	5 mg/m^3	8 hours [(a)]
	20 mg/m^3	1 hour [(a)]
NO_2	40 µg/m^3	Annual [(b)]
	80 µg/m^3	24 hours [(a)]
SO_2	250 µg/m^3	1 hour [(a)]
	80 µg/m^3	24 hours [(a)]
O_3	180 µg/m^3	1 hour [(a)]
	100 µg/m^3	8 hours [(a)]
$PM_{2.5}$	35 µg/m^3	Annual [(b)]
	65 µg/m^3	24 hours [(a)]
PM_{10}	50 µg/m^3	Annual [(b)]
	150 µg/m^3	24 hours [(a)]

Notes:

[a] Not to be exceeded more than once per year.

[b] The objective is attained when the annual arithmetic mean is less than the set value.

Main sources of air pollution of the project sites are Point source emissions from some brick kilns, factories situated near the Meghna River and line sources emissions from vehicles. The concentrations of $PM_{2.5}$ and PM_{10} are higher from November to March as this period is dry season and surrounding brick kiln are in operation, which also indicates the co-relation of $PM_{2.5}$ and PM_{10} with brick kilns. NO_x concentration also tends to be high during winter season

resembling relation of the pollutants with brick kiln and factory operation. The other values were found to be within the National Ambient Air Quality Standard.

B.3.2 Climate

Bangladesh is located at the central part within the Asiatic monsoon region where the climate is tropical. Relatively small size of the country and generally low-lying area cause moderate spatial variation of temperature, precipitation, relative humidity, wind speeds and other climatic variables. However, the climate of Bangladesh exhibits pronounced temporal variability. This is because of the moisture-laden monsoon winds flowing predominantly from the south-west during summer and the comparatively dry and colder north-western winds during winter.

Three seasons are generally recognized: a hot, muggy summer from March to June; a hot, humid and rainy monsoon season from June to November during which more than 85% of the total annual rainfall occurs; and a moderately cold, dry winter from December to February. The beginning of the rainy season vary from year to year; heavy rains may commence anywhere between mid-April and early June and may end anywhere between the end of September and mid-November. Usually winter season is dry with occasional rains. The early summer season is considered from March-April. During summer, the air becomes hot with very low humidity. Early summer is also dominated by Baishakhi cyclone and rains. Figure B.5 represents the climatic conditions of proposed project site location on Bangladesh Climate Elements map.

Solar Radiation

Solar radiation directly affects air quality contributory pollutants and their dispersion through the area. Figure B.4(k) shows CAMS-5 average monthly solar radiation data of year 2012 to 2021.

Precipitation

Figure B.4(l) shows CAMS-5 average monthly rainfall data of year 2012 to 2021 near the study area. The general pattern of precipitation (which consists entirely of rain) follows the monsoon pattern with the cooler, drier months of November to March, increasing rains in April and May, and highest rainfall in the summer months of September and October when the prevailing wind direction from the southwest brings moisture-laden air from the Bay of Bengal. The winter period (November to February) is dry with very little rainfall. Even though the temporal pattern of rainfall is pretty much similar throughout the country.

Relative Humidity

The spatial and temporal variation of Relative Humidity throughout the year is very low in Bangladesh. In the project area, the relative humidity varies from 64.5% to 79.3% (Figure B.4(n)).

Ambient Air Temperature

The temperature of the country is related to the period of rainfall. In general, cool seasons coincide with the period of lowest rainfall. Figure B.4 (m) and B.4.5 shows the monthly average temperature of the study area. Maximum average temperature over the year is usually observed in March - September and minimum average temperature in January.

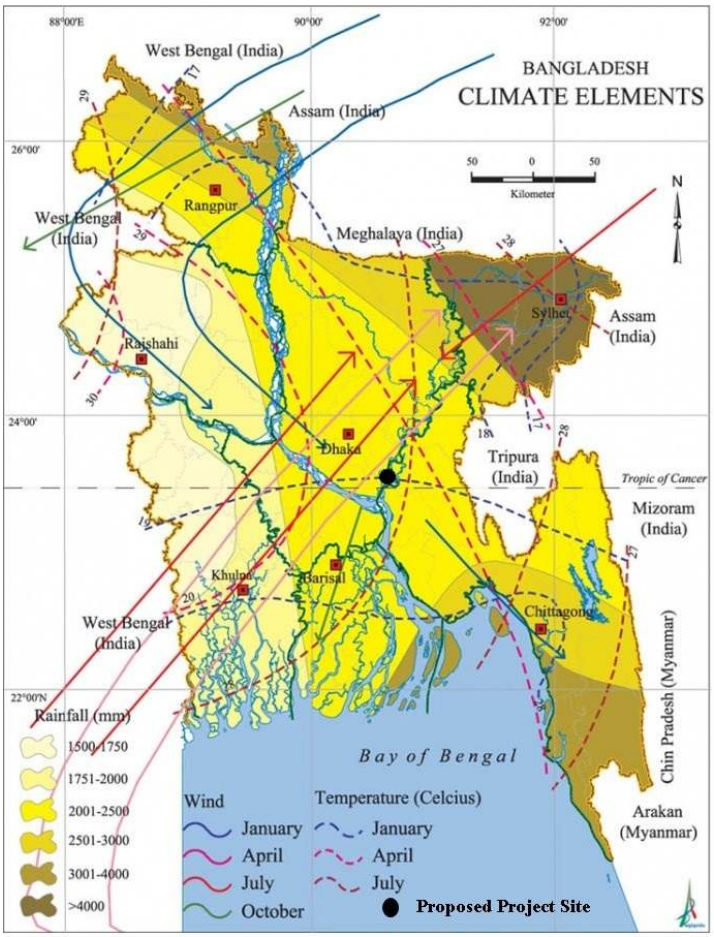


Figure 4.5: The proposed project location on Bangladesh Climate Elements map.

4.3.3 Geology and Seismicity

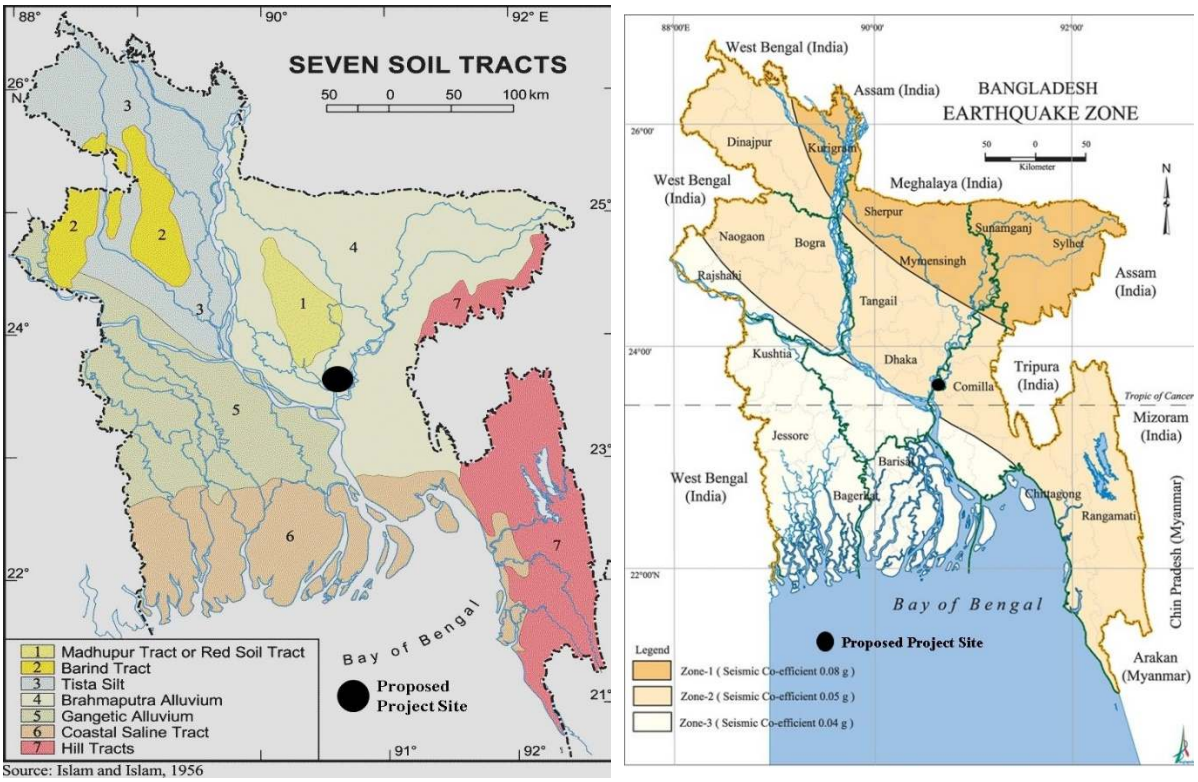
Geology of Bangladesh is generally dominated by poorly consolidated sediments deposit over the past 10,000 to 15,000 years (Holocene age). It is mostly characterized by the rapid subsidence and filling of a basin in which a huge thickness of deltaic sediments were deposited gradually from the north to south. The delta building is still continuing in the present Bay of Bengal and a broad fluvial front of the Ganges-Brahmaputra-Meghna river system gradually follows it from behind.

Soil Characteristics

The soil formation in Bangladesh is remarkably homogeneous in appearance, both vertically and laterally. It comprises layer of unconsolidated clay, about 10m thick near Dhaka, but apparently thinner to the east and possibly much thicker in the west of the Rajshahi district. The sand mineralogy in this area is broadly similar to that of the tertiary hill sediments. Mineral

contents of the soil are high in quartz, relatively low in feldspar and mica, and with zircon, tourmaline, kyanite, staurolite, sillimanite, and epidote dominating the heavy mineral fractions. The content of easily weatherable minerals ranges from 4 to 9%. The soil of Bangladesh can broadly be classified into seven tracts: (1) Madhupur Tract or Red Soil Tract, (2) Barind Tract, (3) Tista Silt, (4) Brahmaputra Alluvium, (5) Gangetic Alluvium, (6) Coastal Saline Tract, and (7) Hill Tracts. Figure B.6 (a) shows the position of the project site area on the soil tract map of Bangladesh.

The Proposed site falls under Brahmaputra Alluvium soil tract which comprises of the former greater districts of Cumilla, Narayanganj, Noakhali and Sylhet except the hilly areas and parts of the former districts of Mymensingh, Dhaka and Chittagong. It covers an area of 40,000 sq km. The dominant soil texture is sandy loam. The soils are acidic in character and the pH ranges from 5.5 to 6.8. The soils are naturally fertile and are recharged every year by fresh deposition by the floodwaters.



(a) (b)

Figure B.6: Location of the proposed site on the (a) seven soil tract map and (b) earthquake zone map of Bangladesh.

To assess the heavy metal contents of the natural soil in the study area soil samples were collected from the project site near the on-going construction area (90°38'56.87"E, 23°35'01.56"N), on-site project area about 150-200m from Meghna Upazilla road bridge (90°39'20.93"E, 23°34’47.23"N) from about 0.15 m below the top of the original soil layer, and one from outside the gate (90°39'21.56"E, 23°35’21.51"N) using a split spoon. Sampling locations for soil samples are presented in Figure B.9. A total extraction of heavy metal from

soil samples following the USEPA guidelines has been performed to determine the selected heavy metal contents and the results are presented in Table B.3 along with the typical concentrations of different heavy metals usually found in natural soils. It can be seen that the heavy metal contents of soil are within usual limits of such metals found in natural soil.

Table B.3: Heavy metal content of the soil from the proposed project site

Parameters	Unit	Concentration Present				Typical content in natural soil[a]
		Near Gate	Construction Site	Near Bridge	Near Bridge	
		21/09/2022	21/09/2022	21/09/2022	21/05/2019	
Ph	-	6.0	6.0	6.5	7.0	--
Electrical Conductivity, EC	µS/cm	236	50	72	92	--
Chloride, Cl-	mg/kg	0.0044	0.0036	0.0032	0.0054	20-900 (avg 100)
Chromium, Cr	mg/kg	0.65	0.79	0.70	0.4	1 – 1000 (avg 100)
Cadmium, Cd	mg/kg	Not detected	Not detected	Not detected	Not detected	0.1 – 0.7 (avg 0.6)
Lead, Pb	mg/kg	0.15	0.17	0.18	0.81	2 – 200 (avg 10)
Nickel, Ni	mg/kg	0.29	0.34	0.32	0.72	5 – 200 (avg 20)
Sulphate, SO4	mg/kg	0.022	0.0024	0.0016	0.0018	--

[a]USEPA Office of Solid Waste and Emergency Response, Hazardous WasteLand Treatment, SW-874 (April 1983, Page 273)

Seismicity

In the north and northeast of Bangladesh, there are areas of high seismic activity and some of the major earthquakes originating in these areas have affected the adjacent regions of the country. The whole of Bangladesh is divided into three seismic zones. The northern part of the country that includes the greater districts of Rangpur, Mymensingh, and Sylhet are in the Zone-I where earthquake shock of maximum intensity of IX of the Modified Mercalli Scale is possible. The Zone-II includes the greater districts of Dinajpur, Bogra, Dhaka and Chittagong and the shocks of intensity of VIII are possible. The southern part of the country, the least active region, where the maximum intensity is not likely to exceed VII, is in the Zone-III. The experts suggest not to construct normal buildings with more than 60m height. Project site falls under zone 2 (Figure B.6 (b))

B.3.4 Natural Disasters

Floods

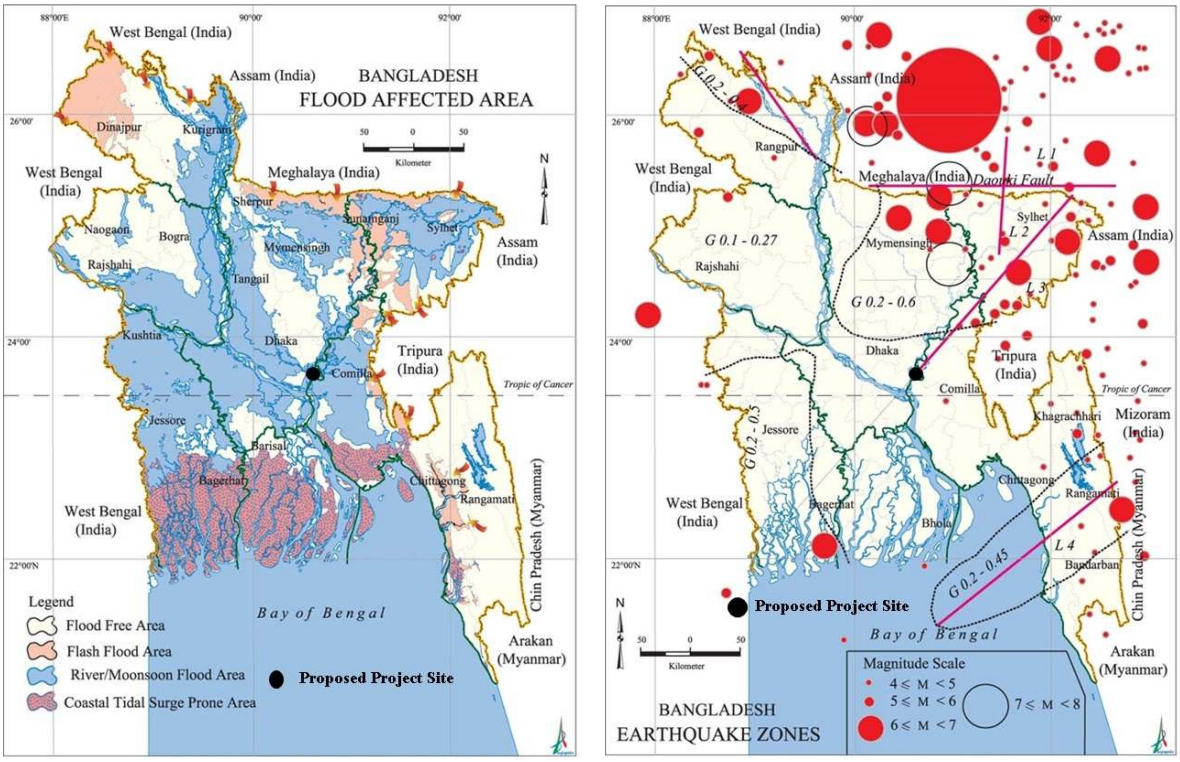
Bangladesh is prone to flooding; the coastal flooding as well as the bursting of Bangladesh's riverbanks is common and severely affects the landscape of the country. 75% of Bangladesh is less than 10m above sea level and 80% is flood plain, therefore rendering Bangladesh as a nation very much at risk of further widespread damage. Flooding normally occurs during the monsoon season from June to September during the monsoon. The convectional rainfall of the monsoon is added to by relief rainfall caused by the Himalayas. Melt-water from the Himalayas is also a significant input and flood every year. Figure B.7 (a) shows the position of the project site over the flood risk map of Bangladesh. It can be observed that the project area is subject to River/Monsoon flooding. The Meghna River flows in close proximity to the project area.

Earthquake

Bangladesh is possibly one of the most vulnerable to potential earthquake threat and damage. Earthquake vulnerability of any place largely depends on its geology and topography, population density, building density and quality, and finally the coping strategy of its people and it shows clear spatial variations. Most of the parts of Chittagong, the port city of Bangladesh consisting of fine sand and silt deposits are susceptible to liquefaction. Chittagong City is mostly a hilly region, but it also consists of alluvial flood plain and sandy sea-shore area. Although the hilly region is less susceptible to liquefaction, it is formed by sandy and clayey soil and the area bottom of the hill also liquefy if the intensity of shaking is high, which may cause landslide in the hilly region. On the other hand, flood plains and sea shore areas consisting of fine sand and silt deposit with shallow water table in most of the places, which may liquefy during a strong earthquake. 4-6 in the north and northeast of Bangladesh, there are areas of high seismic activity and some of the major earthquakes originating in these areas have affected the adjacent regions of the country. The whole of Bangladesh is divided into three seismic zones. The northern part of the country that includes the greater districts of Rangpur, Mymensingh, and Sylhet are in the Zone-I where earthquake shock of maximum intensity of IX of the Modified Mercalli Scale is possible. The Zone-II includes the greater districts of Dinajpur, Bogra, Dhaka and Chittagong and the shocks of intensity of VIII are possible. The southern part of the country, the least active region, where the maximum intensity is not likely to exceed VII, is in the Zone-III. The project area falls under Zone II on the earthquake zone map (Figure 4.7(b)), which implies that earthquakes of moderate intensities are expected here.

Cyclone and Tidal Surge

Bangladesh very often becomes the landing ground of cyclones formed in the Bay of Bengal. A cyclone risk map, prepared by the Management Information and Monitoring (MIM) Division of the Disaster Management Bureau (DMB) in 2001 (Figure B.8), distinguishes between the risk zones of no risk, wind risk, risk (low risk as mentioned in 2003) and high risk. Figure B.8 shows the proposed project site does not fall under cyclone risk zone or high wind area.



(a) (b)

Figure B.7: Location of the proposed site on the (a) Flood Affected Area map and (b) earthquake map of Bangladesh.

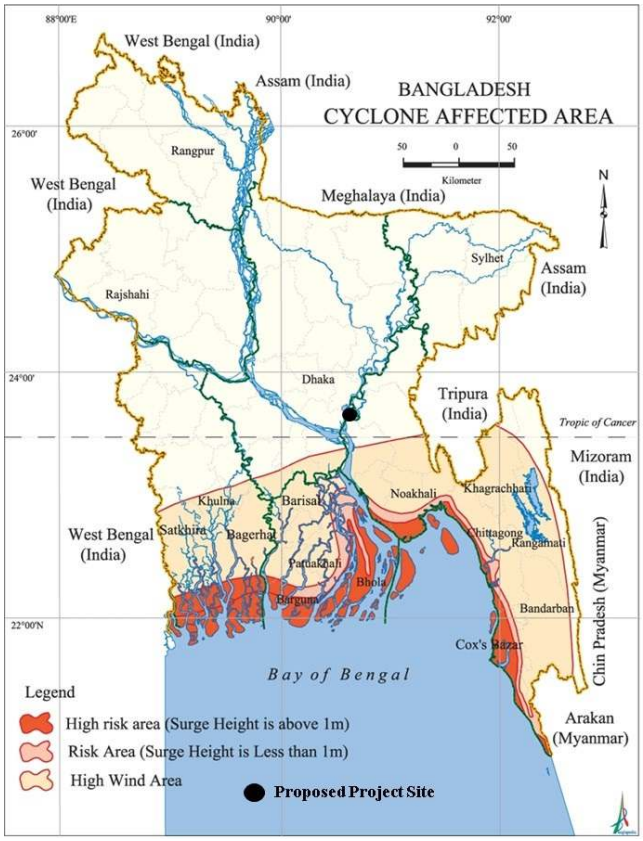


Figure B.8: Proposed area on Cyclone affected area map of Bangladesh.

B.3.5 Water Quality

In order to assess the groundwater quality, two representative groundwater sample and one surface water sample were collected from the study area on May 2019. Details of the samples are presented in Table B.4 and Sampling locations are shown in Figure B.10.

Table 4.4: Details of the water samples.

Sample Type	**Sample Description**	**Sample ID**	**Location**	
			Longitude	**Latitude**
Ground water	CuEZL site office Tubewell	GW	90°39'14.33"E	23°34'49.23"N
Surface Water	Meghna Channel (Branch) near Meghna Upazila road Bridge	SW	90°38'46.31"E	23°34'49.08"N

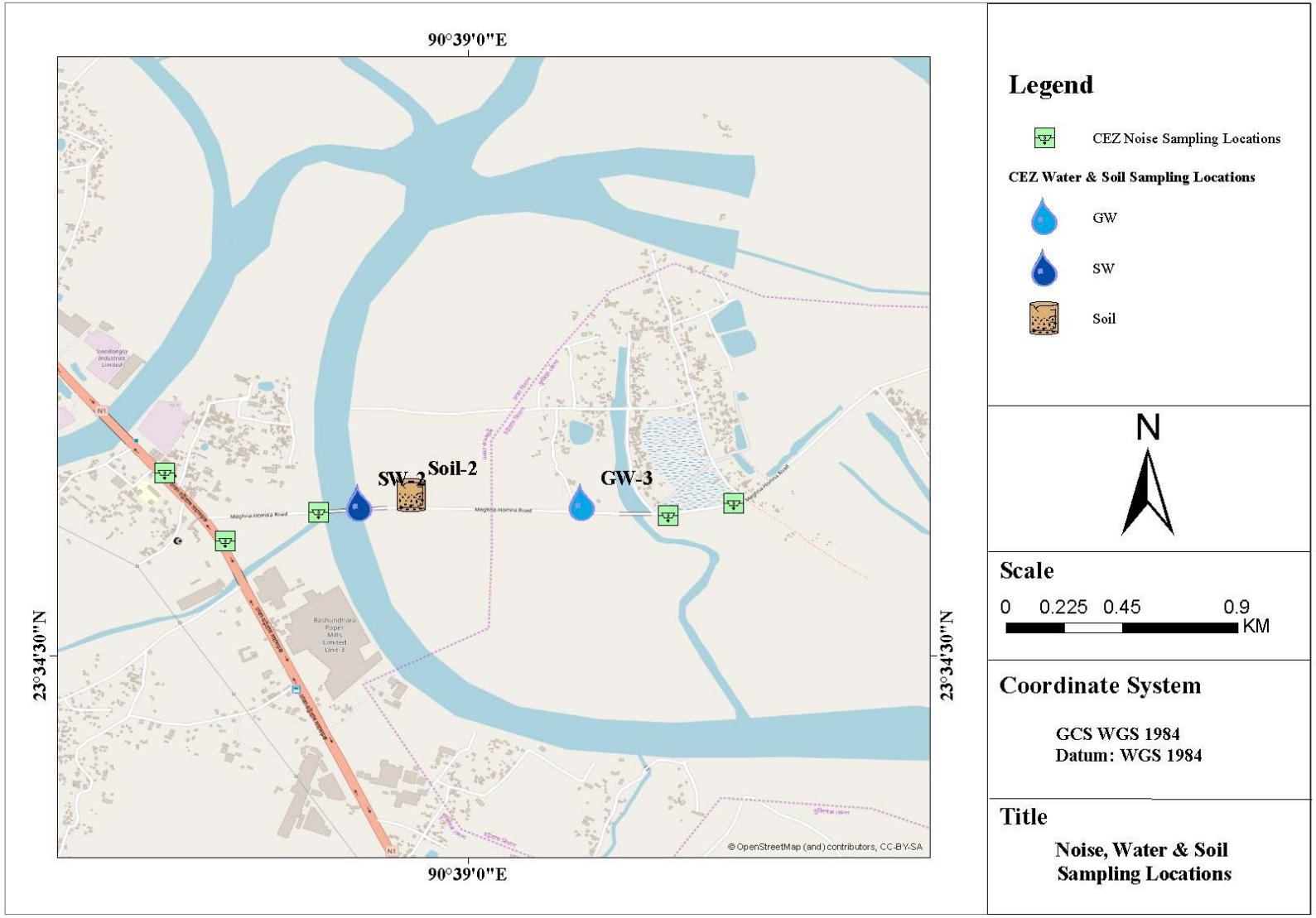


Figure B.9: Water, Soil sampling and Noise measurement locations.

Groundwater quality

Groundwater samples were tested for selected water quality parameters in BUET environmental engineering laboratory. Table B.5 shows the characteristics of the groundwater. From test results of GW, concentrations all parameters all the other groundwater quality parameters were found to be within Bangladesh Standards for drinking water except for Cadmium which slightly exceeded the standards.

Table B.5: Summary of groundwater quality in the study area

Water Quality Parameters	Unit	GW Concentrations Present			WHO Guide line values 2004	Bangladesh Standard for Drinking Water (ECR'23)
		Inside Gate	Construction Site	Outside Boundary		
		21/09/2022	21/09/2022	21/05/2019		
pH	-	6.90	6.66	7.03	6.5 - 8.5	6.5 - 8.5
Turbidity	NTU	0.16	2.47	2.79	5	5
Color	Pt. Co Unit	2	11	9	15	15
Total Hardness as $CaCO_3$	mg/L	196	160	160	500	500
Iron, Fe	mg/L	0.02	0.20	0.32	0.3	0.3 - 1.0
Manganese, Mn	mg/L	2.84	2.06	0.032	0.5	0.4
Arsenic, As	µg/L	<MDL	<MDL	1.7	10	50
Chloride, Cl^-	mg/L	200	155	140	250	250
Lead, Pb	mg/L	<MDL	<MDL	0.003	0.01	0.01
Cadmium, Cd	mg/L	<MDL	<MDL	0.007	0.003	0.003
Chromium, Cr	mg/L	<MDL	<MDL	<MDL	0.05	0.05
Nickle, Ni	mg/L	<MDL	<MDL	<MDL	0.02(p)	0.05
Total Dissolved Solids, TDS	mg/L	462	447	356	1000	1000
Total Coliform, TC	# / 100 ml	0	0	Nil	00 TC / 100 ml	00 TC / 100 ml
Fecal Coliform, FC	# / 100 ml	0	0	Nil	00 FC / 100 ml	00 FC / 100 ml
Electrical Conductivity, EC	µs/cm	725	675	655	-	-

MDL = Minimum Detection Limit

Surface water quality

The main surface water body in the study area is the Meghna River which serves the purpose natural drainage of storm water. Several factories are present on the bank of the river which receives their waste streams. In order to assess any domestic or industrial pollution in nearby areas, surface water can be a good indicator. The water sample, collected from Meghna River, were analyzed in the laboratory for selected parameters. The results of the laboratory analysis are presented in Table B.6. The results indicate that there has been no significant organic pollution in the river as far as BOD, COD, Ammonia concentrations are concerned. The TC and FC values indicate that there is no significant bacterial contamination.

Table B.6: Analysis of surface water sample collected from Meghna River by the side of the study area.

Parameter	**Unit**	**Concentration present**			**Standards for Inland Surface Water (ECR, 2023)**
		21/09/2022	**21/05/2022**	**21/05/2019**	
pH	--	6.46	6.5	7.49	6.5 – 8.5
Turbidity	NTU	15	3.2	3.48	
Electrical Conductivity, EC	µS/cm	76	100	199	
Total Dissolved Solids, TDS	mg/L	56	61	127	
Total suspended Solids, TSS	mg/L	9	7	10	
Total Solids, TS	mg/L	65	68	137	
Dissolved Oxygen, DO	mg/L	4.96	3.55[h]	5.17	$\geq 6^{a}$, $\geq 5^{b}$, $\geq 5^{c}$, $\geq 5^{d}$, $\geq 1^{e}$
Ammonia-Nitrogen, NH3-N	mg/L	0.37	0.16	0.27	
Biochemical Oxygen Demand, BOD5	mg/L	1.4	2.8	2.5	$\leq 2^{a}$, $\leq 3^{b}$, $\leq 3^{c}$ $\leq 6^{d}$, $\leq 12^{e, f}$
Chemical Oxygen Demand, COD	mg/L	8	20	26	$10^{a,b}$, 25^{c}, 50^{d}, $100^{e, f}$
Lead, Pb	mg/L	< MDL[g] (0.01)	< MDL[g] (0.01)	< MDL[g] (0.01)	
Cadmium, Cd	mg/L	< MDL (0.001)	< MDL (0.001)	< MDL (0.001)	
Chromium, Cr	mg/L	< MDL (0.001)	< MDL (0.001)	< MDL (0.001)	
Nickel, Ni	mg/L	< MDL (0.02)	< MDL (0.02)	< MDL (0.02)	
Total Coliform, TC	#/100 ml	1000	72	38	$\leq 50^{a}$, $\leq 200^{b}$, $\leq 5000^{c}$, $\leq 5000^{e}$, 1000^{f}
Fecal Coliform, FC	#/100 ml	500	34	20	

a: to be usable as a source of water supply only after disinfection; b: to be usable for recreational activity
c: to be usable as a source of water supply after conventional treatment; d: to be usable for fisheries
e: to be usable for various process and cooling water for industries; f: to be usable for irrigation

Groundwater Table

Water aquifers are present beneath the vast majority of Bangladesh, which are being recharged by the major river systems and by infiltration of rainwater. The groundwater level fluctuates seasonally, approaching the ground surface at some places of the country during the months July to September. Groundwater is replenished each year during the monsoon season when rain and flood water finds its way into the aquifer slowly percolating down through overlying soils and sediments. The rate of recharge varies depending on the property of soil and geology of the area. Figure B.10 shows the location of the proposed project site on the groundwater zoning map of Bangladesh. It can be seen from the map that groundwater is available at the project site around 5.3-7.8 m below the ground surface.

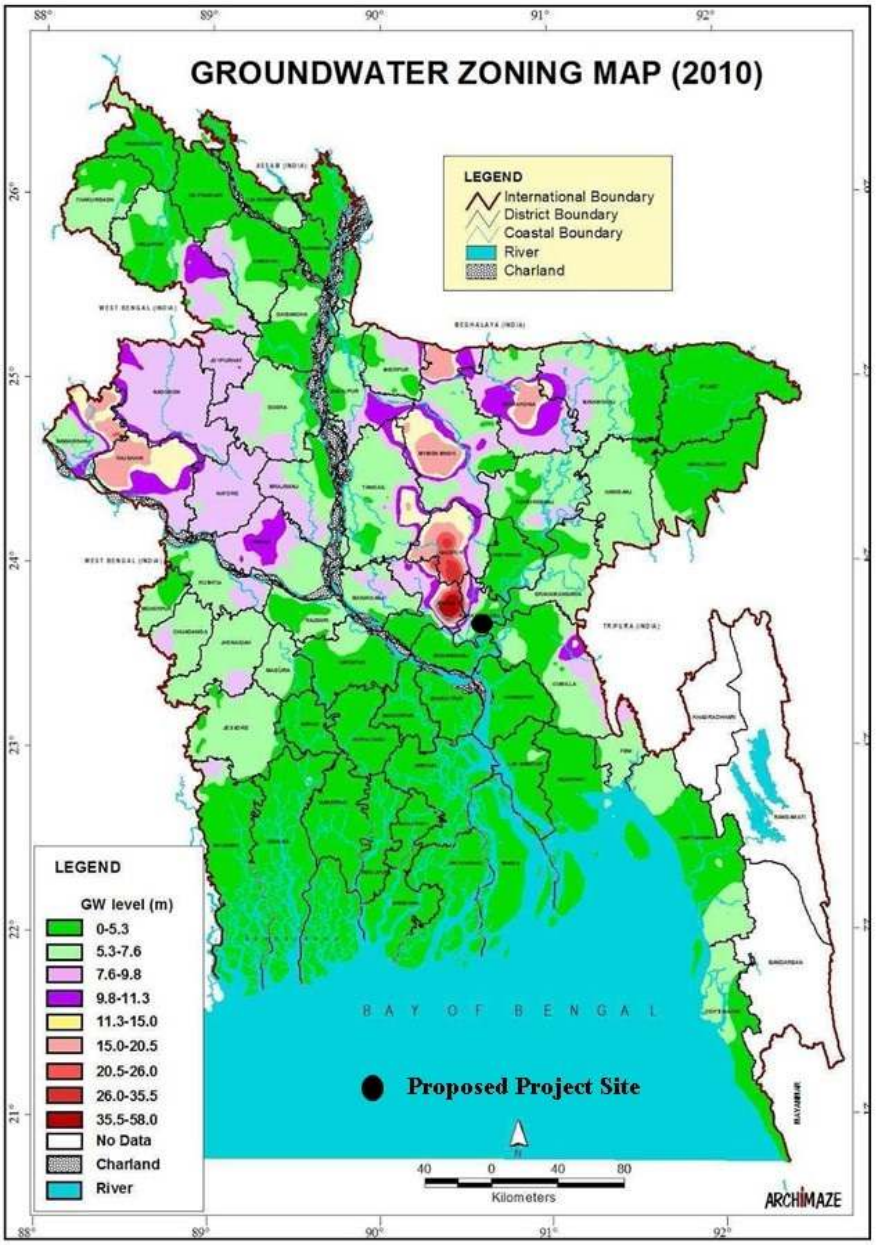


Figure B.10: Location of the CuEZL project site on the Groundwater Zoning Map 2010 of Bangladesh (map source: Bangladesh Agricultural Development Corporation)

B.3.6 Ambient Noise Level

As a part of the baseline study, noise level measurements were made at different locations (Figure 4.9) in and around the project area. Noise measurements were performed during both daytime and night time with a calibrated noise level meter (Extech HD-600). 1-minute continuous noise level measurements were carried out at the selected locations in 'A' Weighting and slow Response mode with 1 sec interval, and the equivalent noise levels (Leq) as well as the maximum and minimum noise levels (Lmax) were determined. Table B.7 shows the summary of noise level measurements carried out in different locations in and around the study area. Table B.8 and Table B.9 shows the Bangladesh noise level standards and the World Health Organization noise level guidelines for community noise (Environmental, Health, and Safety General Guidelines, 2007), respectively, during daytime and nighttime for various types of areas. Table B.10 and B.11 shows the noise limits for various working environments according to Environmental, Health, and Safety General Guidelines and OSHA, respectively.

Table B.7 shows that noise levels at different locations were low because being a rural area and having low activity. Noise measurement locations are shown in Figure B.9.

Table B.7: Noise level measurements during daytime and night time at selected locations

Location Description	Coordinates	Day Time				Night Time			
		Time	Equivalent Noise Level, Leq (dB)	Max	Min	Time	Equivalent Noise Level, Leq (dB)	Max	Min
Near Vater Char Bazar Bus Stand	23°34'52.90"N 90°38'21.90"E	4:43 PM	90.8	109.1	67.3	7:33 PM	79.7	89.4	69.1
Site Approaching Bridge	23°34'47.98"N 90°38'41.22"E	4:48 PM	67.7	80.2	57.4	7:24 PM	71.5	87.9	54.6
Dari Luter Char Outside CuEZL Site	23°34'47.51"N 90°39'25.12"E	4:56 PM	65.9	73.7	55.6	7:22 PM	55.3	59.8	42.4
Luter Char Mosque	23°34'49.04"N 90°39'33.30"E	5:03 PM	62.2	73.7	46.7	7:18 PM	54.2	63.5	46.8
Rasel Tower, Beside Dhaka-Chattogram Highway	23°34'44.32"N 90°38'29.45"E	5:31 PM	81.2	90.1	65.3	7:28 PM	74.4	87.2	61

[Note: The equivalent level is the level (L_{eq}) of a hypothetical steady sound that would have the same energy (i.e., the same time-averaged mean square sound pressure) as the actual fluctuating sound observed. The equivalent level represents the time average of the fluctuating sound pressure and is close to the maximum level observed during the measurement period. For the fluctuating noise scenario the equivalent noise level (L_{eq}) is generally used for more complete noise sample and is calculated as follows:

$$L_{eq} = 10\log_{10}\left[\sum_{i=1}^{n} P_i 10^{L_i/10}\right]$$

where P_i is the probability of the noise level lying in the i-the measurement interval and L_i is the mid-point of that interval.]

Table B.9: Noise Level Guidelines (Guidelines for Community Noise, WHO, 1999)

Receptor	**One Hour L_{Aeq} (dBA)**	
	Daytime 07:00 – 22:00	**Nighttime 22:00 – 7:00**
Residential, institutional, educational	55	45
Industrial, commercial	70	70

Note: For acceptable indoor noise levels for residential, institutional, and education settings refer to WHO (1999)

Table B.10: Noise Limits for Various Working Environments.

Location/ activity	**Equivalent Level L_{Aeq}, 8h**	**Maximum L_{Amax}, fast**
Heavy Industry (no demand for oral communication)	85 dB(A)	110 dB(A)
Light Industry (decreasing demand for oral communication)	50 – 65 dB(A)	110 dB(A)
Open offices, control rooms, service counters or similar	45 – 50 dB(A)	--
Individual offices (no disturbing noises)	40 – 45 dB(A)	--
Classrooms, lecture halls	35 – 40 dB(A)	--
Hospitals	30 – 35 dB(A)	40 dB(A)

Note: For acceptable indoor noise levels for residential, institutional, and education settings refer to WHO (1999)

Table B.11: OSHA Noise Exposure Limits for the Work Environment (Noise Exposure in dBA)

Noise Levels	Permissible Exposure (hours and minutes)
85	16 hrs
87	12 hrs 6 min.
90	8 hrs
93	5 hrs 18 min
96	3 hrs 30 min
99	2 hrs 13 min
102	1 hr 30 min
105	1 hr
108	40 min
111	26 min
114	17 min
115	15 min
118	10 min
121	6.6 min
124	4 min
127	3 min
130	1 min

Note: Exposure above or below the 90 dBA limit have been time weighted to give what OSHA believes are equivalent risks to a 90 dBA 8 hr. exposure (Marsh, 1991, p.322).

B.4 BASELINE ECOLOGY

A rapid ecological baseline study has been carried out for the proposed 'Cumilla Economic Zone Limited (CuEZL)' project of Meghna Group of Industry (MGI), a private entrepreneur in Bangladesh. As noted earlier, the proposed CuEZL project is being established at a piece of char-land/ seasonally inundated agro-wetland that has already been upraised though sand filling by the proponent (MGI), beside a tributary of the Meghna River at Luter Char Union under Meghna Upazila of Cumilla District of Bangladesh (see Figure B.11). The major components of this proposed CuEZL project is shown in Box No B.4.

To establish those components in the proposed CuEZL project area, various types of activities will be required with different dimensions and intensities, during construction and operation phases, and each/ all activities will have some impacts, either positive or negative, on the existing ecological environment. Therefore, separate and detail component-based eco-environmental safeguard studies may be required, which is not covered by this eco-environmental baseline study.

The objectives of this eco-environmental baseline study are to gather information on the existing ecological environment that are present within and adjacent areas of the proposed CuEZL project site. The macro-ecological components, viz. floral, faunal and fish diversity with associated aspects under CuEZL project study area have been considered for this baseline eco-study. This eco-baseline study has been conducted for the proposed CuEZL project and its development

activities; not for the individual industrial activities (construction and operation phases) listed in the Box No B.4.

This Section describes the baseline ecological environment which primarily focused on identifying the faunal, floral and fish diversity and their abundance and distribution within and adjacent to the proposed CuEZL project site as well as their ecological status in Bangladesh. Potential impacts for the proposed CuEZL project activities have been identified, evaluated and described against these baseline situations in the relevant section of this EIA report with suggested mitigation measures and management and monitoring plans.

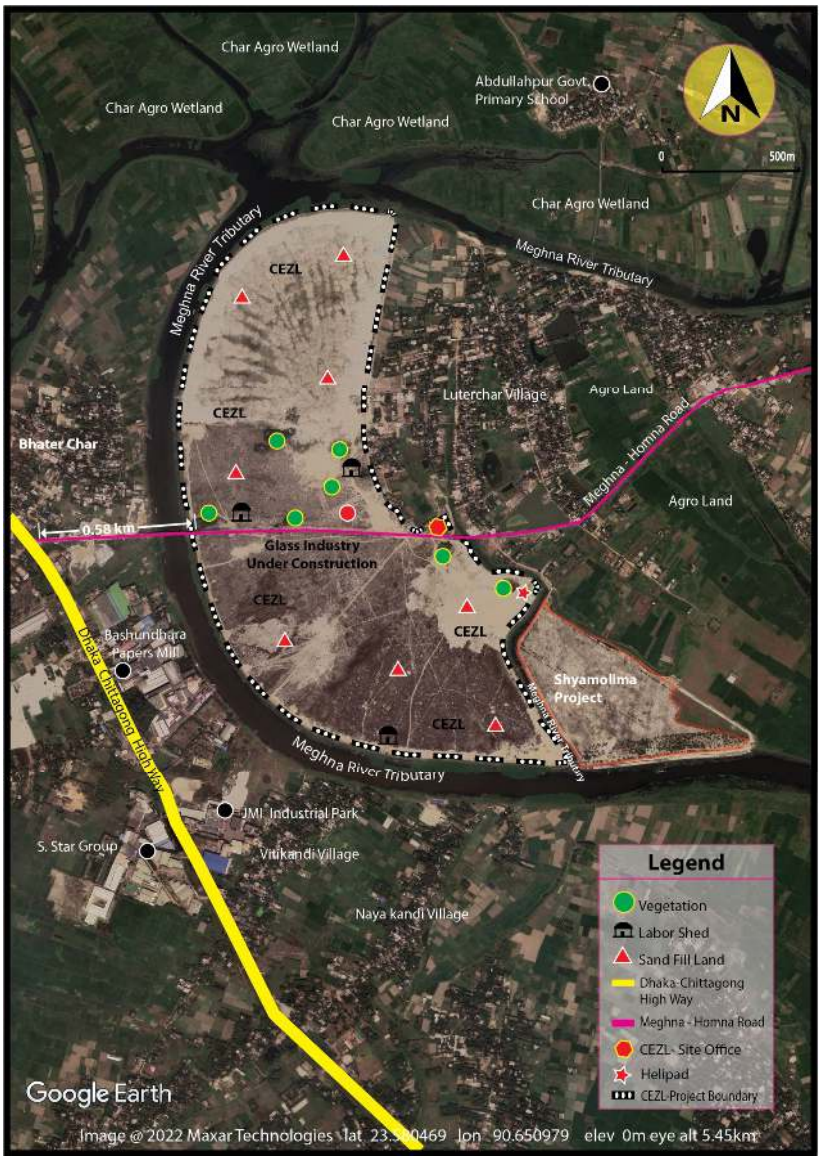


Figure B.11: Google Earth Image shows the proposed CuEZL project site at Luterchar Union under Meghna Upazila of Cumilla District, Bangladesh.

BOX NO B.4 LIST OF PROPOSED DEVELOPMENT COMPONETS AT CUEZL PROJECT SITE				
NO	**NAME**		**AREA**	
			ACRES	**%**
1	Industry	Heavy Industry	97.11	74.64
		Light Industry	86.77	
2	Amenities Area	Water Treatment Plant (WTP)	0.74	5.96
		Central Effluent Treatment Plant (CETP)	0.98	
		Sewerage Treatment Plant (STP)	0.41	
		Sub-station (transformer generator)	1.79	
		Pump House (Central Overhead Water Reservoir)	0.20	
		Gas Regulatory Station	0.18	
		Weight Bridge Cabin	0.01	
		Solid Waste Yard	3.36	
		Residential, Dormitory	4.45	
		Club	0.61	
		Lawn Tennis, Badminton	0.78	
		Mosque	0.29	
		Bank and market, Commercial Building	0.17	
		Fire Station	0.11	
		Police Station	0.04	
		Security Shed / Ansar Camp	0.07	
		Guard Room	0.13	
		Admin and Custom Building	0.16	
		Training Complex	0.10	
		Medical Center and Child Care	0.10	
3	Road and Parking	Road Area	27.04	11.75
		Car Hub	0.46	
		Parking	1.46	
4	Open and Green Area	Green Area (Split Green)	13.4	7.65
		Park	2.34	
		Play Ground	2.55	
		Open Space / Assembly	0.55	
Total			**246.36**	**100**

B.4.1 METHODOLOGY

The baseline ecological study was conducted within and adjacent to the proposed CuEZL project site

(i) to enlist the faunal, floral and fish species with their national and/or international status,
(ii) to enlist keystone, rare and threatened faunal, floral and fish species,
(iii) to investigate the distribution and abundance of faunal, floral and fish species, and
(iv) to make an assessment of the potential impacts on the existing ecological environment for the proposed CuEZL project activities.

Generally, floral, faunal and fish diversity fluctuate seasonally due to the environmental reasons. Seasonal survey, spanning over a year, could provide detailed information on the existing ecological aspects of the proposed CuEZL project site and adjacent areas. However, the ecologist of the EIA team visited the proposed CuEZL project site and adjacent areas in September 2022 to collect firsthand data on the existing floral, faunal and fish diversity. The survey covered an area of 10 km radius from the center point of the proposed CuEZL project site as it falls under RED category project as per Environmental Conservation Rules (ECR, 2023) of the Department of Environment (DOE) of Bangladesh Government (GoB).

The study was conducted primarily in day time but a small part of the study was also conducted at night. Aural and visual search were the main survey methods beside line transect for ornithological study. Herpeto-faunal and mammalian study was done through visual and aural search, line transect method, and discussion with local people, and literature review. Information on fish and fisheries was collected through field study, interviewing fishermen as well as local fish market survey and literature review. Rapid field survey and discussion with local people were the main method for floral survey. Informal interviews with local people were also conducted as a part of this baseline study to learn about seasonal ecological aspects of the proposed CuEZL project site and adjacent areas. The collected data were cross-checked through literature review.

B. 4.2 Ecological perspective of CuEZL Project Site and Adjacent Areas

Bio-ecologically, the proposed CuEZL project site and adjacent area falls under Meghna Floodplain Zone (IUCN-BD, 2002). Agro-ecologically, the proposed CuEZL project site and adjacent area falls under Middle Meghna River Floodplain (BARC/ UNDP/ FAO, 1995). Both non-calcareous dark grey/ grey floodplain soils and also calcareous dark grey/ grey floodplain soils are the prime soil characteristic of the CuEZL project site and adjacent areas, which provides habitat for growing certain type of flora naturally, that subsequently helps to increase the associated insect population, which primarily consumed by the local fauna, and, thus, it make an eco-relationship through ecological niche.

Before uprising the proposed CuEZL project site through sand accumulation, some fauna use the proposed land as their permanent, seasonal and/ or temporary habitat, but now most of these fauna have compel to leave the proposed CuEZL area due to habitat destruction, scarcity of food and other living subsistence. Only a few numbers and varieties of local adaptive fauna still use the area as their temporary habitat due to non-availability of adequate flora as well as other necessary living subsistence. Few numbers of terrestrial flora still exist in scattered way within the proposed CuEZL project site (Figure B.11) that provides habitat for certain type of fauna which depend primarily

on flora; but, for other certain types of burrowing and wetland (seasonal and permanent) dependent fauna habitats have already been fully destroyed.

Several villages and some concrete made structures/ industries with full operation/ function exist, adjacent to the proposed CuEZL project site with diversified flora that provide moderate habitats for the local fauna, because these floral species provide life supporting system for the local fauna throughout the year. Vegetable garden in the villages and associate lands promotes to increase the insect population number which primarily consumed by the local fauna. In general, insects and fruits are the prime foods for most fauna. Seasonal agricultural wet-lands that exist outside the proposed CuEZL project site also produce agro-products (e.g. paddy, vegetable, cereals, etc.), and the seed grain of these agro-products also consumed by certain type of fauna, seasonally.

Most of the lands of the CuEZL project study areas are char-land, and some of these lands are inundate seasonally and provide moderate habitat for the local fauna, though these are frequently disturbed by natural calamities such as storm, cyclone, flood, etc. Wetland, Canal, Pond, the Meghna River and its tributary are the prime habitats for fish and aquatic fauna. Fishermen catch the Hilsha -*Tenualosa ilisha* fish in association with other fish species from the Meghna River and its tributaries, and all of these fishes have commercial value to the human society. Certain type of raptor fauna catch the fishes from the Meghna River and its tributaries near the CuEZL project site and also from the seasonal agricultural wetlands. Thus, in turn, help to balance the existing ecosystem by making an ecological niche. Sustainable fish harvesting from river or tributary or canal or wetland enrich the aquatic ecosystem by balancing its components in an appropriate way. Few ponds exist in the villages, and some of them are used to culture the carp and exotic fishes for human consumption though some of these fish are also catch by certain type of fauna.

However, some of the faunal, floral and fish aspects that exist within and adjacent to the proposed CuEZL project site are shown in **Figure B.12, Figure B.13** and **Figure B.14**.

(a)

(b)

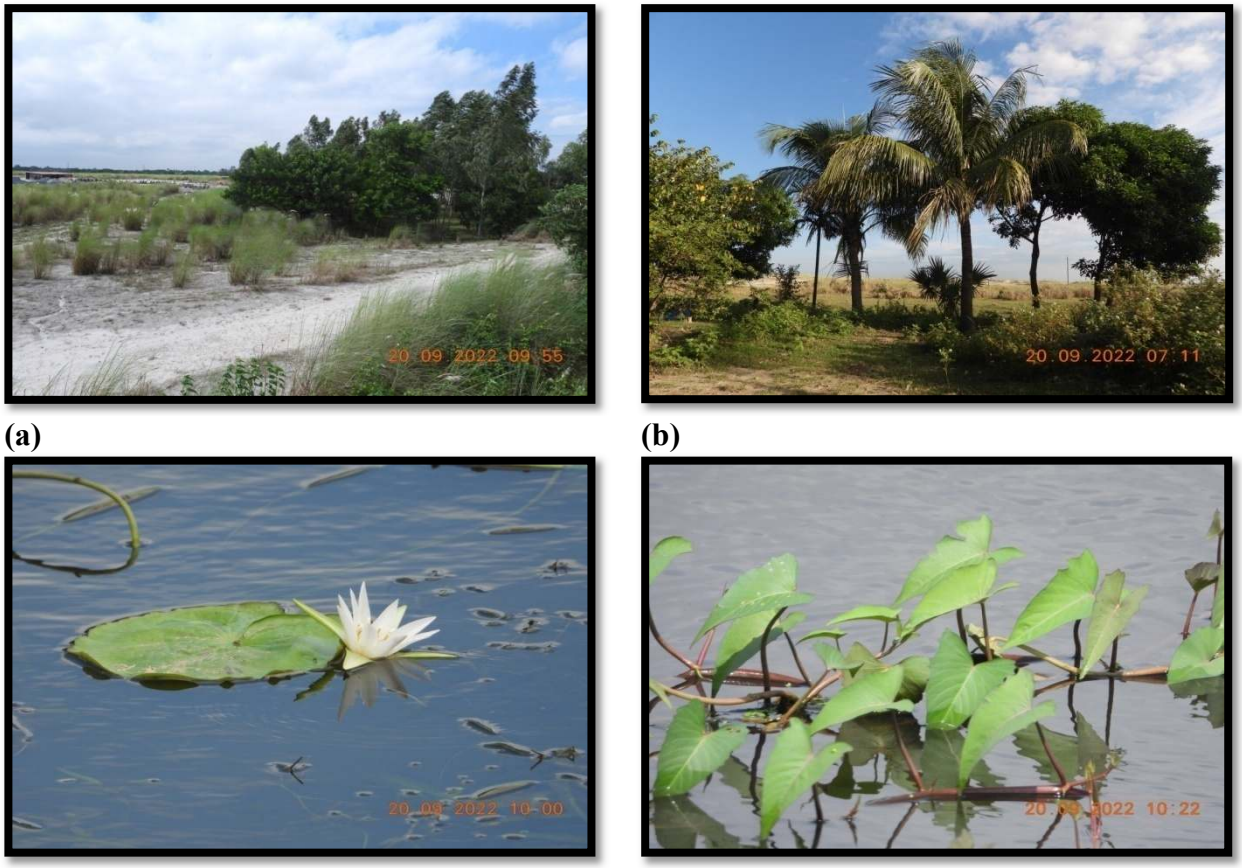
(c) **(d)**

Figure B.12: Faunal diversity observed within and adjacent to the proposed CuEZL project site: (a) Black-winged Kite - *Elanus caeruleus*, a terrestrial avi-fauna, observed within the project site, (b) *Common Garden Lizard* - *Calotes versicolor,* a terrestrial herpeto-fauna, observed adjacent to the project site, (c) White-throated Kingfisher - *Halcyon smyrnensis*, an aquatic avi-fauna, observed within the project site, and (d) Eurasian Collared Dove - *Streptopelia decaocto*, a terrestrial avi-fauna, observed within the project site.

(a) **(b)**

(c) **(d)**

Figure B.13: Fish diversity observed, adjacent to the proposed CuEZL project site: (a) and (b) fish species, various type, catches from the tributary of main Meghna River, (c) and (d) fishing practice in the tributary of main Meghna River.



(a) **(b)**

(c) **(d)**

Figure B.14: Floral diversity observed, within and adjacent to the proposed CuEZL project site: (a) and (b) planted mixed terrestrial flora, observed within the project site, (c) Star Lotus - *Nymphaea nouchali*, an aquatic flora, observed adjacent to the project site, and (d) Water Spinach - *Alternanthera philoxeroides*, observed adjacent to the project site.

B 4.3 FAUNAL, FISH AND FLORAL DIVERSITY

This baseline ecological study considered the macro ecological aspects of the proposed CuEZL project site as well as its adjacent areas. Macro ecological aspects primarily consist of floral, faunal and fish diversity. However, the macro ecological aspects of the proposed CuEZL project site and adjacent areas are described below, separately in brief:

B 4.3.1 Faunal Diversity

Diversified faunal species exist within and outside areas of the proposed CuEZL project site that play a vital role to balance the existing char-agro-wetland ecosystem near a tributary of the mighty Meghna River. Some species use the areas as their permanent habitat, while others use as temporary habitat. On the basis of habitats, the faunal species found within and adjacent to the proposed CuEZL project site has been divided into two major categories viz. (a) aquatic fauna, and (b) terrestrial fauna. Brief description of that faunal diversity is given below:

<u>Aquatic Fauna:</u> Aquatic habitat dependent faunal species are the main components of aquatic fauna, which includes amphibian, reptilian, avian, and mammalian species (Figure B.15). The reproduction, breeding and multiplication of aquatic fauna is finely tuned and adjusted to the rhythm and amplitude of monsoon flooding, especially inside the seasonal char-agro-wetlands. Aquatic fauna is generally divided into 4 major groups, viz. mammal, aves, reptile, and amphibia. A total of 47 aquatic faunal species have so far been identified from the CuEZL project site and its adjacent areas, and two-third of them fall under aquatic avian category. A breakdown of identified aquatic faunal species habit is shown in Figure B.16, which indicates that areas within and adjacent to the proposed CuEZL project site are moderately rich in aquatic fauna. A complete list of identified aquatic faunal species with their abundance, distribution and status (national and international) are given in Table B.12 to Table B.15.

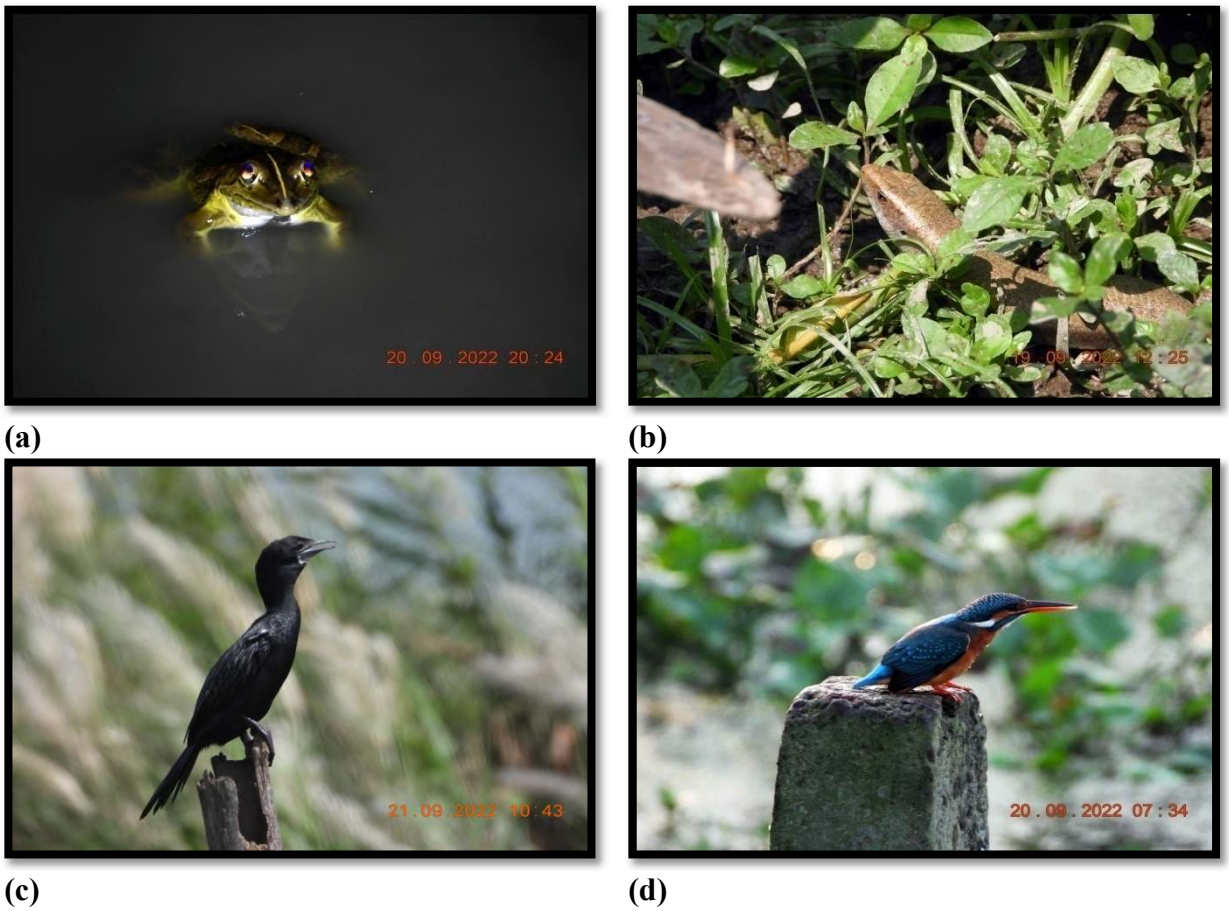


Figure B.15: Aquatic fauna observed, adjacent to the proposed CuEZL project site: (a) Asian Bull Frog - *Hoplobatrachus tigerinus*, an aquatic herpeto-faunal species, observed adjacent to the project site, (b) Keeled Indian Skink - *Eutropis carinata*, an aquatic herpeto-faunal, observed adjacent to the project site, (c) Little Cormorant - *Phalacrocorax niger*, a semi-aquatic avian species, observed adjacent to the project site, and (d) Common Kingfisher - *Alcedo atthis*, a semi-aquatic avian species, observed adjacent to the project site.

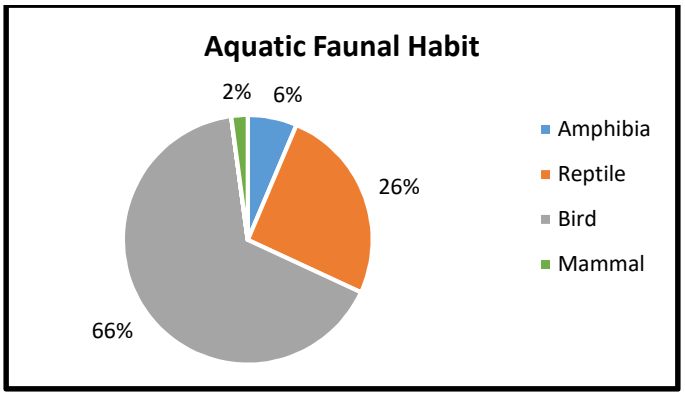


Figure B.16: Distribution of aquatic faunal habit (%) in areas within and adjacent to the proposed CuEZL project site.

Table B.12: List of Identified Aquatic Amphibian Species that exist in areas within and adjacent to the CuEZL project site.

#.	Name		Habit	O	PR	LI	Abundance			Status											Distribution	
	English	Scientific								Bangladesh										Global		
							VC	C	R	RE	EX	EW	CR	EN	VU	NT	LC	DD	NE	CT		1	2
1	Asian Bull Frog	*Hoplobatrachustigerinus*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	Y	LC	N	Y
2	Skipper Frog	*Euphlyctis cyanophlyctis*	A	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
3	Yellow-striped Frog	*Hylarana tytleri*	A	N	N	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y

Note: A = Aquatic, O = Observed, PR = Previous Record, LI = Local Information, Y =Yes, N = No, VC = Very Common, C = Common, R = Rare, RE = Regionally Extinct, EX = Extinct, EW = Extinct in the Wild, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern, DD = Data Deficient, NE = Not Evaluated, CT = Commercially Threatened, 1 = within CuEZL project site, 2 = adjacent areas of CuEZL project site.

Table B.13: List of Identified Aquatic Reptilian Species that exist in areas within and adjacent to the CuEZL project site

S. N.	Name		Habit	O	PR	LI	Abundance			Status											Distribution	
	English	Scientific								Bangladesh										Global		
							VC	C	R	RE	EX	EW	CR	EN	VU	NT	LC	DD	NE	CT		1	2
1	Brown Softshell Turtle	*Nilssonia hurum*	A	N	Y	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	N	Y	LC	N	Y
2	Ganges Soft Shell Turtle	*Aspideretes gangeticus*	A	N	Y	Y	N	N	Y	N	N	N	N	Y	N	N	N	N	N	Y	VU	N	Y
3	Brown Roofed Turtle	*Pangshura smithii*	A	N	Y	Y	N	N	Y	N	N	N	N	N	N	Y	N	N	N	Y	NT	N	Y
4	Indian Roofed Turtle	*Pangshura tecta*	A	N	Y	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	N	Y	LC	N	Y
5	Spotted Flapshell Turtle	*Lissemys punctata*	A	N	Y	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	N	Y	LC	N	Y
6	Bronze Grass Skink	*Eutropis macularia*	A	N	Y	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
7	Keeled Indian skink	*Eutropis carinata*	A	Y	Y	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
8	Common S-scaled Water Snake	*Enhydris enhydris*	A	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
9	Checkered Keelback	*Xenochrophis piscator*	A	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	NE	N	Y
10	Striped Keelback	*Amphiesma stolatum*	A	N	Y	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	NE	N	Y
11	Dark Bellied Marsh Snake	*Xenochrophis cerasogaster*	A	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	NE	N	Y
12	Glossy Marsh Snake	*Gerarda prevostiana*	A	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y

Note: A = Aquatic, O = Observed, PR = Previous Record, LI = Local Information, Y =Yes, N = No, VC = Very Common, C = Common, R = Rare, RE = Regionally Extinct, EX = Extinct, EW = Extinct in the Wild, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern, DD = Data Deficient, NE = Not Evaluated, CT = Commercially Threatened, 1 = within CuEZL project site, 2 = adjacent areas of CuEZL project site.

Table B.14: List of Identified Aquatic Avian Species that exist in areas within and adjacent to the CuEZL project site.

S. N.	Name		Habit	O	PR	LI	Abundance			Status											Distribution	
	English	Scientific								Bangladesh										Global		
							VC	C	R	RE	EX	EW	CR	EN	VU	NT	LC	DD	NE	CT		1	2
1	Asian Openbill	*Anastomus oscitans*	A	N	Y	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
2	Bronze-winged Jacana	*Metopidius indicus*	A	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
3	Common Kingfisher	*Alcedo atthis*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
4	Common Snipe	*Gallinagogallinago*	A	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
5	Cattle Egret	*Bubulcus ibis*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
6	Fantail Snipe	*Gallinagogallinago*	A	N	Y	Y	N	N	Y	N	N	N	N	N	N	Y	N	N	N	N	LC	N	Y
7	Great Egret	*Casmerodius albus*	A	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
8	Pond Heron	*Ardeola grayii*	A	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
9	Little Cormorant	*Phalacrocorax niger*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
10	Little Egret	*Egretta garzetta,*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
11	Lesser Whistling Duck	*Dendrocygna javanica*	A	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
12	Marsh Sandpiper	*Tringa stagnatilis*	A	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
13	Osprey	*Pandion haliaetus*	A	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
14	River Tern	*Sterna aurntia*	A	N	Y	Y	N	Y	N	N	N	N	N	N	N	Y	N	N	N	N	NT	N	Y
15	Striated Heron	*Butorides striata*	A	N	Y	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
16	White-throated Kingfisher	*Halcyon smyrnensis*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
17	White-breasted Water-hen	*Amaurornis phoenicurus*	A	N	Y	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
18	White Wagtail	*Motacilla alba*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y

Note: A = Aquatic, O = Observed, PR = Previous Record, LI = Local Information, Y =Yes, N = No, VC = Very Common, C = Common, R = Rare, RE = Regionally Extinct, EX = Extinct, EW = Extinct in the Wild, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern, DD = Data Deficient, NE = Not Evaluated, CT = Commercially Threatened, 1 = within CuEZL project site, 2 = adjacent areas of CuEZL project site.

Table B.15: List of Identified Aquatic Mammalian Species that exist in areas within and adjacent to the CuEZL project site

S. N.	Name		Habit	O	PR	LI	Abundance			Status											Distribution	
	English	Scientific								Bangladesh										Global		
							VC	C	R	RE	EX	EW	CR	EN	VU	NT	LC	DD	NE	CT		1	2
1	Ganges River Dolphin	*Platanista gangetica*	A	N	Y	Y	N	N	Y	N	N	N	N	N	Y	N	N	N	N	N	EN	N	Y

Note: A = Aquatic, O = Observed, PR = Previous Record, LI = Local Information, Y =Yes, N = No, VC = Very Common, C = Common, R = Rare, RE = Regionally Extinct, EX = Extinct, EW = Extinct in the Wild, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern, DD = Data Deficient, NE = Not Evaluated, CT = Commercially Threatened, 1 = within CuEZL project site, 2 = adjacent areas of CuEZL project site.

Terrestrial Fauna: Several species of amphibia, reptile, bird and mammal are the main components of the terrestrial fauna (Figure B.17). These faunal species depend on (partially or fully) the terrestrial environment to live or to get food, shelter, nest, breed, and produce offspring. The study areas have various types of lands (e.g. char, homestead, agricultural, fallow, wet, barren, etc.) with diversified flora that provide moderate eco-environment for the existing terrestrial fauna. The terrestrial fauna is divided into 4 major groups, viz. amphibian, reptile, avian, and mammal. A total of 78 terrestrial faunal species have so far been identified from the proposed CuEZL project site and adjacent areas, and almost two-third of them falls under terrestrial avian category. A breakdown of identified terrestrial faunal species habit is shown in Figure B.18, which indicates that the project study site is moderately rich with the terrestrial avian species. A complete list of identified terrestrial faunal species with their abundance, distribution and status (national and international) are given in Table B.16 to Table B.19.

(a)

(b)

(c)

(d)

(e) **(f)**

Figure B.17: Terrestrial fauna observed, within and adjacent to the proposed CuEZL project site: (a) Common Toad - *Duttaphrynus melanostictus*, a terrestrial herpeto-faunal species, observed within the project site, (b) Binocellate Cobra - *Naja naja,* a terrestrial herpeto-faunal species, observed in dead-state, within the project site, (c) Common House Lizard - *Hemidactylus frenatus*, a terrestrial herpeto-faunal species, observed adjacent to the project site, (d) White-throated Munia - *Euodice malabarica*, a terrestrial avian species, observed within the project site, (e) Red-vented Bulbul - *Pycnonotus cafer,* a terrestrial avian species, observed adjacent to the project site, and (f) Den of Bandicoot Rat - *Bandicota indica*, a terrestrial mammalian species, observed adjacent to the project site.

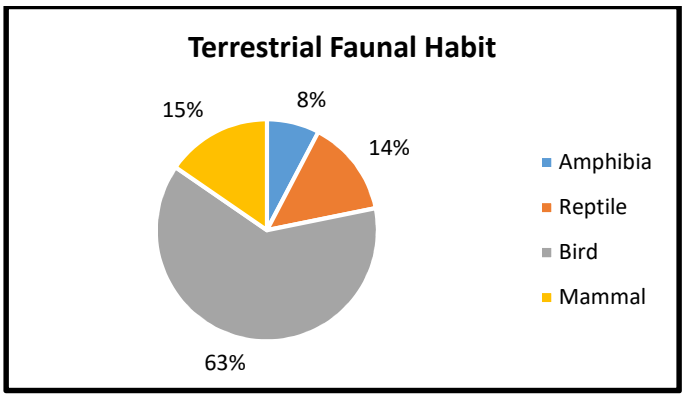


Figure B.18: Distribution of terrestrial faunal habit (%) in areas within and adjacent to the proposed CuEZL project site.

Table B.16: List of Identified Terrestrial Amphibian Species that exist in areas within and adjacent to the CuEZL project site

S. N.	Name		Habit	O	PR	LI	Abundance			Status											Distribution	
										Bangladesh										Global		
	English	Scientific					VC	C	R	RE	EX	EW	CR	EN	VU	NT	LC	DD	NE	CT		1	2
1	Asian Common Toad	*Duttaphrynus melanostictus*	T	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	LC	Y	Y
2	Asian Cricket Frog	*Fejervaria limnocharis*	T	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
3	Common Tree Frog	*Polypedates leucomystax*	T	N	Y	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
4	Maculated Tree Frog	*Polypedates maculates*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
5	Pierre's Cricket Frog	*Fejervarya pierrei*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
6	Two-striped Grass Frog	*Hylarana taipehensis*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y

Note: A = Aquatic, O = Observed, PR = Previous Record, LI = Local Information, Y =Yes, N = No, VC = Very Common, C = Common, R = Rare, RE = Regionally Extinct, EX = Extinct, EW = Extinct in the Wild, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern, DD = Data Deficient, NE = Not Evaluated, CT = Commercially Threatened, 1 = within CuEZL project site, 2 = adjacent areas of CuEZL project site.

Table B.17: List of Identified Terrestrial Reptilian Species that exist in areas within and adjacent to the CuEZL project site

S. N.	Name		Habit	O	PR	LI	Abundance			Status											Distribution	
										Bangladesh										Global		
	English	Scientific					VC	C	R	RE	EX	EW	CR	EN	VU	NT	LC	DD	NE	CT		1	2
1	Bengal Monitor Lizard	*Varanus bengalensis*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	Y	N	N	N	N	LC	N	Y
2	Banded Krait	*Bungarus fasciatus*	T	N	Y	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
3	Binocellate Cobra	*Naja naja*	T	Y	Y	Y	N	N	Y	N	N	N	N	N	N	Y	N	N	N	N	NE	Y	Y
4	Common Garden Lizard	*Calotes versicolor*	T	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	NE	N	Y
5	Common House Lizard	*Hemidactylus flaviviridis*	T	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
6	Common House Gecko	*Hemidactylus frenatus*	T	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
7	Common Krait	*Bungarus caeruleus*	T	N	Y	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	NE	N	Y
8	Indian Rat Snake	*Ptyas mucosa*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	NE	N	Y
9	Short-nosed Vine Snake	*Ahaetulla prasina*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	NE	N	Y
10	Tokay Gecko	*Gekko gecko*	T	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	Y	LC	N	Y
11	Yellow Monitor Lizard	*Varanus salvator*	T	Y	Y	Y	N	Y	N	N	N	N	N	N	N	Y	N	N	N	N	LC	N	Y

Note: A = Aquatic, O = Observed, PR = Previous Record, LI = Local Information, Y =Yes, N = No, VC = Very Common, C = Common, R = Rare, RE = Regionally Extinct, EX = Extinct, EW = Extinct in the Wild, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern, DD = Data Deficient, NE = Not Evaluated, CT = Commercially Threatened, 1 = within CuEZL project site, 2 = adjacent areas of CuEZL project site.

Table B.18: List of Identified Terrestrial Avian Species that exist in areas within and adjacent to the CuEZL project site

S. N.	Name		Habit	O	PR	LI	Abundance			Status												Distribution	
	English	Scientific								Bangladesh											Global		
							VC	C	R	RE	EX	EW	CR	EN	VU	NT	LC	DD	NE	CT		1	2
1	Asian Koel	*Eudynamys scolopacea*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
2	Asian Open-bill Stork	*Anastomus oscitans*	T	N	Y	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
3	Asian Palm Swift	*Cypsiurus balasiensis*	T	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	Y	Y
4	Asian Pied Starling	*Sturnus contra*	T	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	LC	Y	Y
5	Ashy Swallow Shrike	*Arthoarnus fuscus*	T	N	Y	N	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
6	Baya Weaver	*Ploceus philippinus*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
7	Barn Owl	*Tyto alba*	T	N	Y	N	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
8	Black Kite	*Milvus migrans*	T	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	LC	Y	Y
9	Black-Hooded Oriole	*Oriolus xanthornus*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
10	Black Headed Shrike	*Lanius schach*	T	Y	Y	N	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	LC	Y	Y
11	Black Drongo	*Dicrurus macrocercus*	T	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	LC	Y	Y
12	Black-headed Munia	*Lonchura Malacca*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
13	Black-rumped Flameback	*Dinopium benghalense*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
14	Black-winged Kite	*Elanus caeruleus*	T	Y	N	N	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
15	Brahminy Kite	*Haliastur Indus*	T	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	Y	Y
16	Brown Shrike	*Lanius cristatus*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
17	Common Flameback	Dinopiumjavanense	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
18	Common Iora	*Aegithina tiphia*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
19	Common Myna	*Acridotheres tristis*	T	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	LC	Y	Y
20	Common Tailorbird	*Orthotomus sutorius*	T	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	LC	Y	Y
21	Coppersmith Barbet	*Megalaima haemacephala*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
22	Chestnut-headedBee-eater	*Merops leschenaultia*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
23	Crow Pheasant	*Centropus sinensis*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
24	Eurasian Collared Dove	*Streptopelia decaocto*	T	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	Y	Y
25	Green Bee-eater	*Merops orientalis*	T	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
26	Greater Coucal	*Centropus sinensis*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
27	House Crow	*Corvus splendens*	T	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	LC	Y	Y
28	House Sparrow	*Passer domesticus*	T	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	LC	Y	Y
29	Indian Cuckoo	*Cuculus micropterus*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
30	Jungle Babbler	*Turdoides striatus*	T	N	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	N	LC	N	Y
31	Jungle Myna	*Acridotheres fuscus*	T	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
32	Lineated Barbet	*Megalaima lineate*	T	Y	Y	N	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
33	Large-billed Crow	*Corvus macrorhynchos*	T	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
34	Lesser Coucal	*Centropus bengalensis*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
35	Oriental Magpie Robin	*Copsychus saularis*	T	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	YN	Y
36	Oriental Skylark ·	Alauda gulgula	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
37	Plain Prinia	*Prinia inornata*	T	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	Y	Y
38	Paddy-field Warbler	*Acrocephalus Agricola*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y

S. N.	Name		Habit	O	PR	LI	Abundance			Status											Distribution	
	English	Scientific								Bangladesh										Global		
							VC	C	R	RE	EX	EW	CR	EN	VU	NT	LC	DD	NE	CT		1	2
39	Purple Sunbird	*Cinnyris asiaticus*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
40	Paddy-field Pipit	*Anthus rufulus*	T	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
41	Rock Pigeon	*Columba livia*	T	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
42	Rose-ringed Parakeet	*Psittacula krameri*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
43	Rufous Tree pie	*Dendrocitta vagabunda*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
44	Red-vented Bulbul	*Pycnonotus cafer*	T	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	Y	Y
45	Spotted Munia	Lonchurapunctulata	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	Y	N	N	N	N	LC	N	Y
46	Spotted Dove	*Streptopelia chinensis*	T	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
47	White-throated Munia	*Euodice malabarica,*	T	Y	N	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	Y	Y
48	White Throated Fantail	*Rhipidura albicollis*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
49	Zitting Cisticola	*Cisticola juncidis*	T	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	Y	Y

Note: A = Aquatic, O = Observed, PR = Previous Record, LI = Local Information, Y =Yes, N = No, VC = Very Common, C = Common, R = Rare, RE = Regionally Extinct, EX = Extinct, EW = Extinct in the Wild, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern, DD = Data Deficient, NE = Not Evaluated, CT = Commercially Threatened, 1 = within CuEZL project site, 2 = adjacent areas of CuEZL project site.

Table B.19: List of Identified Terrestrial Mammalian Species that exist in areas within and adjacent to the CuEZL project site.

S. N.	Name		Habit	O	PR	LI	Abundance			Status											Distribution	
	English	Scientific								Bangladesh										Global		
							VC	C	R	RE	EX	EW	CR	EN	VU	NT	LC	DD	NE	CT		1	2
1	Asian House Shrew	*Suncus murinus*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
2	Asian Palm Civet	*Paradoxurus hermaphroditus*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
3	Bandicoot Rat	*Bandicota indica*	T	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	Y	Y
4	Common House Rat	*Rattus rattus*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
5	Flying Fox	*Pteropus giganteus*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
6	Fulvous Fruit Bat	*Rousettus leschenaultia*	T	N	Y	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
7	Golden Jackal	*Canis aureus*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	Y	Y
8	House Mouse	*Mus musculus*	T	N	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
9	Indian Pipistrelle	*Pipistrellus coromandra*	T	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	Y	Y
10	Indian Field Mouse	*Mus booduga*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
11	Irrawaddy Squirrel	*Callosciurus pygerythrus*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
12	Small Indian Mongoose	*Herpestes javanicus*	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y

Note: A = Aquatic, O = Observed, PR = Previous Record, LI = Local Information, Y =Yes, N = No, VC = Very Common, C = Common, R = Rare, RE = Regionally Extinct, EX = Extinct, EW = Extinct in the Wild, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern, DD = Data Deficient, NE = Not Evaluated, CT = Commercially Threatened, 1 = within CuEZL project site, 2 = adjacent areas of CuEZL project site

Fish Diversity

Diversified fish species exist in various types of wetlands near the proposed CuEZL project site (Figure B.19). Only freshwater fish habitat exists in the proposed CuEZL project study areas, and year-round intensive fishing activities occur with various types of fishing gears (Figure B.20). Freshwater habitats exist in the tributary of the Meghna River, canal, pond, wetland, etc., which are an important nursery ground for native fish species. Some ponds in the villages have freshwater, which provide habitat for certain types of freshwater dependent fish species. Freshwater habitat in river and tributary are dynamic in nature and are influenced by the diurnal tidal fluctuation. The number of freshwater fish species is moderately variable within the river and tributary depending on river-tidal flows. However, a total of 52 fish species have so far been identified from the proposed CuEZL project adjacent areas which indicate that the project study areas are moderately rich with the freshwater fish species. A complete list of identified freshwater fish species with their abundance, distribution and status (national and international) are given in Table B.20.

(a)

(b)

(c)

(d)

(e) **(f)**

Figure B.19: Fish fauna observed, adjacent to proposed CuEZL project site: (a) Puntio Barb - *Puntius puntio*, a fresh-water dependent fish species, catch from the Meghna River tributary, observed to sell in a local market, (b) Mottled Nandus - *Nandus nandus,* a fresh-water dependent fish species, catch from the Meghna River tributary, observed to sell in a local market, (c) various type of fresh-water dependent fish, catches from the Meghna River tributary, (d) to (f) various type of fish species, catches from the Meghna River tributary, observed to sell in a local afternoon market.

(a)

(b)

(c)

(d)

(e)

(f)

Figure B.20: Fish habitat and fishing gear observed, within and adjacent to the proposed CuEZL project site: (a) pond, a freshwater-fish habitat, exist within the project site, (b) Meghna River tributary, natural freshwater fish habitat, exist in the periphery of the project site, (c) to (e) local fishermen with various fishing gear, that use to catch fish from the Meghna River tributary, and (f) fish culture practice inside the Meghna River tributary.

Table B.20: List of Identified Fish Species that exist in areas within and adjacent to the CuEZL project site

S. N.	Name (Freshwater Dependent Fish)		Habit	O	PR	LI	Abundance			Status												Distribution	
										Bangladesh											Global		
	English	Scientific					VC	C	R	RE	EX	EW	CR	EN	VU	NT	LC	DD	NE	CT		1	2
1	Asiatic Snakehead	*Channa orientalis*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
2	Bumblebee Goby	*Brachygobius nunas*	A	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
3	Climbing Perch	*Anabas testudineus*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	DD	N	Y
4	Catla Carp	*Catla catla*	A	Y	Y	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	NE	N	Y
5	Elongate Glass-Perchlet	*Chanda nama*	A	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
6	Flying Barb	*Esomus danricus*	A	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	NT	N	Y
7	Freshwater Shark	*Wallago attu*	A	Y	Y	Y	N	N	Y	N	N	N	N	N	Y	N	N	N	N	N	VU	N	Y
8	Freshwater Garfish	*Xenentodon cancila*	A	Y	Y	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	NE	N	Y
9	Fresh Water Goby	*Glossogobius giuris*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
10	Gangetic Mystus	*Mystus cavasius*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	Y	N	N	N	N	LC	N	Y
11	Gangetic Mudeel	*Monopterus cuchia*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	Y	N	N	N	N	N	LC	N	Y
12	Gangetic Gagata	*Gagata youssouf*	A	N	Y	Y	N	N	Y	N	N	N	N	N	N	Y	N	N	N	N	LC	N	Y
13	Gangetic Goonch	*Bagarius bagarius*	A	N	Y	Y	N	N	Y	N	N	N	Y	N	N	N	N	N	N	N	NT	N	Y
14	Grass Carp	*Ctenopharyn godonidella*	A	N	Y	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
15	Garua Bacha	*Clupisoma garua*	A	Y	Y	Y	N	N	Y	N	N	N	N	Y	N	N	N	N	N	Y	NE	N	Y
16	Gagora Catfish	*Arius gagora*	A	N	Y	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
17	Ganges River Gizzard Shad	*Gonialosa manmina*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
18	Grey Featerback	*Notopterus notopterus*	A	Y	Y	Y	N	N	Y	N	N	N	N	N	Y	N	N	N	N	Y	LC	N	Y
19	Great Snakehead	*Channa marulius*	A	N	Y	Y	N	N	Y	N	N	N	N	Y	N	N	N	N	N	N	LC	N	Y
20	Hilsa Fish	*Tenualosa ilisha*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
21	Humped Featherback	*Chitala chitala*	A	Y	Y	Y	N	N	Y	N	N	N	N	Y	N	N	N	N	N	Y	NE	N	Y
22	Indian Carplet	*Ambhypharyngodon microlepis*	A	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
23	Indian River Shad	*Gudusia chapra*	A	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
24	Indian Threadfish	*Polydactylus indicus*	A	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
25	Indian Mottled Eel	*Anguilla bengalensis*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	Y	N	N	N	N	N	LC	N	Y
26	Large Razorbelly	*Salmostama bacaila*	A	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
27	Long-whiskered Catfish	*Sperata aor*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	Y	N	N	N	N	Y	LC	N	Y
28	Mottled Nandus	*Nandus nandus*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	Y	N	N	N	N	LC	N	Y
29	Mrigal Carp	*Cirrhinus mrigala*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
30	Orangefin Labeo	*Labeo calbasu*	A	N	Y	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
31	One-stripe Spinyeel	*Macrognathus aculeatus*	A	Y	Y	Y	N	N	Y	N	N	N	N	N	N	Y	N	N	N	N	LC	N	Y
32	Pangas Catfish	*Pangasius pangasius*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
33	Rita	*Rita rita*	A	Y	Y	Y	N	Y	N	N	N	N	N	Y	N	N	N	N	N	N	LC	N	Y
34	Pabda Catfish	*Ompok pabda*	A	Y	Y	Y	N	Y	N	N	N	N	N	Y	N	N	N	N	N	N	NT	N	Y
35	Rohu Carp	*Labeo rohita*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
36	Rosy Barb	*Puntius conchonius*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y

S. N.	Name (Freshwater Dependent Fish)		Habit	O	PR	LI	Abundance			Status											Distribution	
										Bangladesh										Global		
	English	Scientific					VC	C	R	RE	EX	EW	CR	EN	VU	NT	LC	DD	NE	CT		1	2
37	Rice–paddy Eel	*Pisodonophis boro*	A	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
38	Scribbled Goby	*Awaous grammepomus*	A	N	Y	Y	N	N	Y	N	N	N	N	N	Y	N	N	N	N	Y	LC	N	Y
39	Stinging Catfish	*Heteropneustes fossilis*	A	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
40	Striped Snakehead	*Channa striatus*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
41	Sunset Gourami	*Trichogaster chuna*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
42	Swamp/ Chola Barb	*Puntius chola*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
43	Spotted Snakehead	*Channa punctatus*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
44	Soldier Catfish	*Osteogeneiosus militaris*	A	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	NE	N	Y
45	Scribbled Goby	*Awaous guamensis*	A	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
46	Tilapia fish	*Oreochromis mossambicus*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
47	Ticto / Firefin Barb	*Pethia ticto*	A	N	Y	Y	N	Y	N	N	N	N	N	N	Y	N	N	N	N	N	LC	N	Y
48	Tengra Mystus	*Mystus tengara*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
49	Walking Catfish	*Clarius batrachus*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
50	Walking Goby	*Scartelaos histophorus*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
51	Lanceolate Goby	*Pseudapocryptes elongates*	A	Y	N	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
52	Pama Croaker	*Otolithoides pama*	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y

Note: A = Aquatic, O = Observed, PR = Previous Record, LI = Local Information, Y =Yes, N = No, VC = Very Common, C = Common, R = Rare, RE = Regionally Extinct, EX = Extinct, EW = Extinct in the Wild, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern, DD = Data Deficient, NE = Not Evaluated, CT = Commercially Threatened, 1 = within CuEZL project site, 2 = adjacent areas of CuEZL project site.

B 4.3.2 Floral Diversity

Various types of flora exist within and adjacent to the proposed CuEZL project site, and these flora play a vital role to maintain the balance of existing eco-environment. Generally, flora plays vital socio-economic and ecological role in a particular type of habitat or ecosystem. Some flora develop adaptive aspects to survive in particular types of habitats. Some other flora are habituated with soil, some with water and others with both soil and water for their normal growth and development. On the basis of habitats, the floral species found in areas within and adjacent to the proposed CuEZL project site have been divided into two major categories viz. (a) aquatic flora, and (b) terrestrial flora. Brief descriptions of these flora are given below:

Aquatic Flora: The proposed CuEZL project site has few species of aquatic flora due to the sand-fill inside the char-agro-wetland, but the adjacent areas have plenty of native aquatic flora, and most of these are abundant in the rainy season; a few of them have economical value to the human society.

The proposed CuEZL project site has only one freshwater pond without aquatic flora. On the other hand, various types of water-bodies exist near the proposed CuEZL project site, and these water-bodies provide moderate to suitable habitat for the growth of certain types of aquatic flora in submerged, free-floating, or rooted state. The common freshwater aquatic floral species are: Kachripana - *Eichhornia crassipes*, Kalmi – *Alternanthera philoxeroides,* Helencha - *Enhydra flactuans,* Topapana - *Pistia strateotes,* Katchu - *Colocasia esculenta,* etc. (Figure B.21). The aquatic floras are divided into three major aquatic floral habit, viz. tree, herb and shrub. A total of 22 aquatic floral species have so far been identified at the proposed CuEZL project study areas, and most of them are of herb species. A snapshot of identified aquatic floral species is shown in Figure B.22, which indicates that the area is moderately rich with aquatic herb-floral diversity. A complete list of identified aquatic floral species with their abundance, distribution and status (national and international) are given in Table B.21.

(a)

(b)

(c) **(d)**

Figure B.21: Aquatic flora observed, adjacent to the proposed CuEZL project site: (a) Water Hyacinth - *Eichhornia crassipes,* an aquatic flora, observed in the Meghna River tributary, near periphery of project site, (b) Barun - *Crataeva nurvala,* an aquatic flora, observed in a village beside Meghna River tributary, (c) Alligator Weed - *Alternanthera philoxeroides,* an aquatic flora, observed in a wetland, and (d) Nol-khagra - *Phragmites korka,* an aquatic flora, observed beside Meghna River tributary.

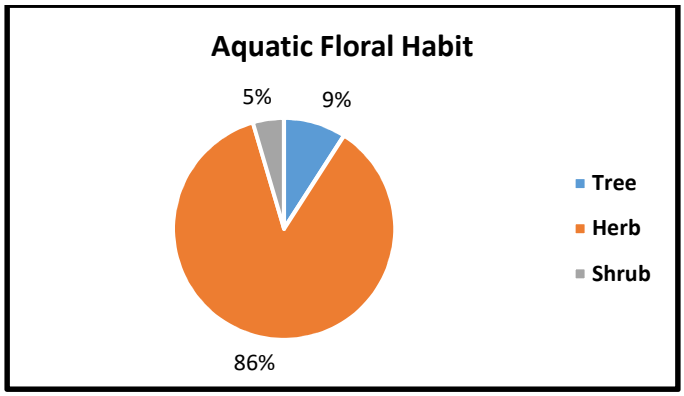


Figure B.22: Distribution of aquatic floral habit (%) in areas within and adjacent to the proposed CuEZL project site.

Table B.21: List of Identified (full/semi) Aquatic Floral Species that exist in areas within and adjacent to the CuEZL project site.

S. N.	Name			Habit	O	PR	LI	Abundance			Status					Distribution	
	Family	Native	Scientific					VC	C	R	Bangladesh				Global	1	2
											T	NT	U	CT	U		
1	Amaranthaceae	Helencha	*Alternanthera philoxeroides*	H	Y	Y	Y	Y	N	N	N	N	Y	N	Y	N	Y
		Haicha	*Alternanthera sesilis*	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
2	Aponogetonaceae	Ghenchu	*Aponogetonnatans*	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
3	Araceae	Topapana	*Pistia strateotes*	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
		Katchu	*Colocasia esculenta*	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
4	Capparaceae	Barun	*Crateva nurvala*	T	Y	Y	Y	N	N	Y	N	N	Y	N	Y	N	Y
5	Compositae	Helencha	*Enhydra fluctuans*	H	N	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
6	Convolvulaceae	Kalmi	*Ipomoea aquatic*	S	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
7	Gramineae	Nolkhagra	*Arundo donax*	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
		Janglidhan	*Hygroryza aristata*	H	N	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
8	Hydrocharitaceae	Patajhangi	*Vallisneria spiralis*	H	N	Y	N	N	Y	N	N	N	Y	N	Y	N	Y
		Janjhi	*Hydrilla verticillata*	H	N	Y	N	N	Y	N	N	N	Y	N	Y	N	Y
	Lecythidaceae	Hijal	*Barringtonia acutangula*	T	N	Y	N	N	N	Y	N	N	Y	N	Y	N	Y
9	Limnaceae	Khudipana	*Lemna perpusilla*	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
	Nymphaeaceae	Shapla	*Nymphaea nouchali*	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
10	Menyanthaceae	Chandmala	*Nymphoides indica*	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
11	Marsileaceae	Shushni	*Marsilea quadrifolia*	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
12	Onagraceae	Keshordam	*Ludwigia adscendens*	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
13	Pontederiaceae	Kachuripana	*Eichhornia crassipes*	H	Y	Y	Y	Y	N	N	N	N	Y	N	Y	N	Y
		Boronukha	*Monochoria hastata*	H	Y	Y	Y	Y	N	N	N	N	Y	N	Y	N	Y
		Sarkachu	*Monochoria vaginalis*	H	Y	Y	Y	Y	N	N	N	N	Y	N	Y	N	Y
14	Salviniaceae	Indurkanipana	*Salvinia cuculata*	H	N	Y	Y	N	N	Y	N	N	Y	N	Y	N	Y

Note: O = Observed, PR = Previous Record, LI = Local Information, Y =Yes, N = No, H = Herb, S = Shrub, T = Tree, VC = Very Common, C = Common, R = Rare, T = Threatened, NT = Not Threatened, U = Unknown, CT = Commercially Threatened, 1 = within CuEZL project site, 2 = adjacent areas of CuEZL project site.

<u>Terrestrial Flora:</u> The proposed CuEZL project site has few species of terrestrial flora, but adjacent areas have remarkable number of mixed planted native and exotic terrestrial flora. Most of the flora of project study areas are planted and have economical value to the human society. Generally, the terrestrial flora makes a complex ecosystem in which local fauna have direct relationship through their ecological niche. Common terrestrial flora are: Coconut - *Coccos nucifera*, Banana - *Musa paradisiacal*, Fig - *Ficus hispida*, Date Palm - *Phoenix sylvestris*, Palm - *Borassus fiabellifer*, etc. (Figure B.23). However, the terrestrial floras have been divided into three terrestrial floral habit viz. tree, herb and shrub. A total of 81 terrestrial floral species have so far been identified from the proposed CuEZL project site and adjacent areas, and more than half of them are trees followed by herbs. A snapshot of identified terrestrial floral species is shown in Figure B.24, which indicates that the areas are moderately rich in planted terrestrial tree-floral diversity. A complete list of identified terrestrial floral species with their abundance, distribution and status (national and international) are given in Table B.22.

(a)

(b)

(c)

(d)

(e) **(f)**

Figure B.23: Terrestrial flora observed, within and adjacent to the proposed CuEZL project site: (a) mixed flora, observed within the project site, (b) various types of matured mixed terrestrial flora, observed in a village, adjacent to the project site, (c) fruit of Sweet Sop - *Annona squamosa*, observed in a village, adjacent to the project site, (d) fruit of E*lephant Apple* - *Dillenia indica*, observed within the project site, (e) Bael - *Aegle marmelos,* observed within the project site, and (f) fruit of Fig - *Ficus hispida,* observed in a village, adjacent to the project site.

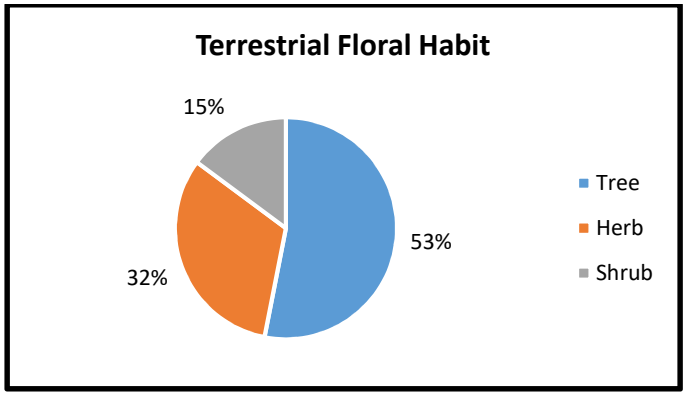


Figure B.24: Distribution of terrestrial floral habit (%) in areas within and adjacent to the proposed CuEZL project site.

Table B.22: List of Identified Terrestrial Floral Species that exist in areas within and adjacent to the CuEZL project site.

S. N.	Name			Habit	O	P R	L I	Abundance			Status					Distribution	
	Family	Native	Scientific					VC	C	R	Bangladesh				Global	1	2
											T	NT	U	CT	U		
1	Amaranthaceae	Datashak	*Amaranthus viridis*	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
		Kantanotey	*Amaranthus spinosus*	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
		Lalshak	*Amaranthus tricolor*	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
		Mankachu	*Alocasia macrorrhizos*	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
		Note	*Amaranthus viridis*	H	N	Y	N	N	Y	N	N	N	Y	N	Y	N	Y
2	Annonaceae	Ata	*Annona squamosa*	T	Y	Y	Y	N	N	Y	N	N	Y	N	Y	Y	Y
		Sharifa	*Annona reticulate*	T	N	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
3	Anacardiaceae	Aam	*Mangifera indica*	T	Y	Y	Y	N	Y	N	Y	N	Y	N	Y	Y	Y
		Amra	*Spondias pinnata*	T	N	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
		Bhadi	*Lannea coromamndelica*	T	N	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
		Kajubadam	*Anacardium occidentale*	T	N	Y	Y	N	N	Y	N	N	Y	N	Y	N	Y
4	Averhoaceae	Kamranga	*Averrhoa carambala*	T	Y	Y	Y	N	N	Y	N	N	Y	N	Y	Y	Y
5	Apocynaceae	Togar	*Tabarnaemontana divericata*	S	N	Y	Y	N	N	Y	N	N	Y	N	Y	N	Y
	.	Koromcha	*Carissa carandas*	S	N	Y	Y	N	N	Y	N	N	Y	N	Y	N	Y
		Nayantara	*Catharanthus roseus*	H	N	Y	Y	N	N	Y	N	N	Y	N	Y	N	Y
		Halde Karabi	*Thevetia peruviana*	H	N	Y	N	N	N	Y	N	N	Y	N	Y	N	Y
6	Asclepiadaceae	Akonda	*Synedrella nodiflora*	T	N	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
7	Arecaceae	Narikel	*Coccos nucifera*	T	Y	Y	Y	Y	N	N	N	N	Y	N	Y	Y	Y
		Oilpalm	*Elaeisguiyanensis*	T	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
		Khejur	*Phoenix sylvestris*	T	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
		Supari	*Areca catechu*	T	Y	Y	Y	N	Y	N	N	N	Y	N	Y	Y	Y
		Tal	*Borassus flabellifer*	T	Y	Y	Y	N	N	Y	N	N	Y	N	Y	Y	Y
8	Araceae	Katchu	*Colocasia esculenta*	H	Y	Y	Y	Y	N	N	N	N	Y	N	Y	Y	Y
9	Bombacaceae	Simul	*Bombix cliba*	T	Y	Y	Y	N	N	Y	N	N	Y	N	Y	N	Y
		Burna Simul	*Ceiba pentandra*	T	N	Y	Y	N	N	Y	N	N	Y	N	Y	N	Y
10	Boraginaceae	Hatisur	*Heliotropium indicum*	H	Y	Y	Y	Y	N	N	N	N	Y	N	Y	N	Y
11	Basellaceae	Pui Shak	*Basella rubra*	S	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
12	Brassicaceae	Rai Sorisa	*Brassica juncea*	H	N	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
		Mula	*Raphanus sativus*	H	N	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
13	Burseraceae	Bhadi	*Garuga pinnata*	T	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
14	Casuarinaceae	Jhau	*Casuarinas equisetifolie*	T	Y	Y	Y	Y	N	N	N	N	Y	N	Y	N	Y
15	Caesalpiniaceae	Krishnachura	*Delonix regia*	T	Y	Y	Y	N	Y	N	N	N	Y	N	Y	Y	Y
16	Convolvulaceae	Dholkalmi	*Ipomoea fistulosa*	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	Y	Y
		Sweet Potato	*Ipomoea batatas*	S	Y	N	Y	N	Y	N	N	N	Y	N	Y	N	Y

S. N.	Name			Habit	O	P R	L I	Abundance			Status					Distribution	
	Family	Native	Scientific					VC	C	R	Bangladesh				Global	1	2
											T	NT	U	CT	U		
17	Combretaceae	Kath Badam	*Terminalia catapa*	T	N	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
18	Cucurbitaceae	Lau	*Lagenaria vulgaris*	S	N	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
		Dhundul	*Luffa aegypticea*	S	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
		Jhinga	*Luffa acutangula*	S	N	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
		Korolla	*Momordica charantia*	S	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
19	Caricaceae	Pepe	*Carica papaya*	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
	Dilleniaceae	Chalta	*Dillenia indica*	T	Y	Y	Y	N	Y	N	N	N	Y	N	Y	Y	Y
20	Euphorbiaceae	Orboroi	*Ciccaacida*	T	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
		Bon-Tulshi	*Croton bonplandianum*	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
21	Fabaceae	Seem	*Dolichos lablab*	S	N	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
		Mandar	*Erythrina variagata*	T	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
22	Gramineae	Paddy	*Oryza sativa*	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
23	Lamiaceae	Tokma	*Hyptissauveolens*	H	N	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
		Shetodron	*Leucas aspera*	H	N	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
24	Liliaceae	Bon Pias	*Urginea indica*	H	N	Y	N	N	N	Y	N	N	Y	N	Y	N	Y
	Leguminosae	Jilapi	*Pithecellobium dulce*	T	Y	Y	Y	N	Y	N	N	N	Y	N	Y	Y	Y
		Tetul	*Tamarindus indica*	T	Y	Y	Y	N	Y	N	N	N	Y	N	Y	Y	Y
25	Malvaceae	Derosh	*Abelmoschus esculentus*	H	N	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
26	Meliaceae	Mehagini	*Swietenia mahagoni*	T	Y	Y	Y	N	Y	N	N	N	Y	N	Y	Y	Y
		Gora Neem	*Melia sempervirens*	T	Y	Y	Y	N	Y	N	N	N	Y	N	Y	Y	Y
27	Moraceae	Sheora	*Sireblus asper*	T	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
		Pakur	*Ficus infectoria*	T	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
		Bot	*Ficus benghalensis*	T	Y	Y	Y	N	Y	N	N	N	Y	N	Y	Y	Y
		Kathal	*Artocarpus heterophyllus*	T	Y	Y	Y	N	Y	N	N	N	Y	N	Y	Y	Y
		Deua	*Artocarpus lacucha*	T	Y	Y	Y	N	Y	N	N	N	Y	N	Y	Y	Y
28	Myrtaceae	Payara	*Psidium guayava*	T	Y	Y	Y	N	Y	N	N	N	Y	N	Y	Y	Y
		Eucalyptus	*Eucalyptus citriodora*	T	Y	Y	Y	Y	N	N	N	N	Y	N	Y	Y	Y
		Jaam	Syzygium cumini	T	Y	Y	Y	N	Y	N	N	N	Y	N	Y	Y	Y
29	Mimosaceae	Akashmoni	*Acacia auriculiformis*	T	Y	Y	Y	N	Y	N	N	N	Y	N	Y	Y	Y
		Beljium	*Acacia maengium*	T	N	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
		Koroi	*Albizia procera*	T	Y	Y	Y	N	Y	N	N	N	Y	N	Y	Y	Y
		Mimosa	*Mimosa pudica*	H	N	Y	N	N	N	Y	N	N	Y	N	Y	N	Y
		Raintree	*Samanea saman*	T	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
	Musaceae	Kola	*Musa paradisiacal*	H	Y	Y	Y	Y	N	N	N	N	Y	N	Y	Y	Y
		Kola	*Musa sapientum*	H	Y	Y	Y	Y	N	N	N	N	Y	N	Y	N	Y
30	Nyctaginaceae	Punornova	*Boerhaavia repens*	H	N	Y	Y	N	N	Y	N	N	Y	N	Y	N	Y

S. N.	Name			Habit	O	PR	LI	Abundance			Status					Distribution	
	Family	Native	Scientific					VC	C	R	Bangladesh				Global	1	2
											T	NT	U	CT	U		
31	Poaceae	Borakbans	*Bambusa vulgaris*	T	N	Y	Y	N	N	Y	N	N	Y	N	Y	N	Y
		Durbaghas	*Cynodondactylon*	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
		Uri	*Porteresia coarctata*	H	Y	Y	Y	Y	N	N	N	N	Y	N	Y	N	Y
32	Rhamnaceae	Boroi	*Zizyphus mauritiana*	T	Y	Y	Y	N	Y	N	N	N	Y	N	Y	Y	Y
	Rubiaceae	Kadom	*Anthocephalus indicus*	T	Y	Y	Y	N	Y	N	N	N	Y	N	Y	Y	Y
33	Rutaceae	Bel	*Aegle marmelos*	T	Y	Y	Y	N	N	Y	N	N	Y	N	Y	Y	Y
		Jambura	*Citrus grandis*	T	Y	Y	Y	N	Y	N	N	N	Y	N	Y	Y	Y
		Lebu	*Citrus auranticola*	S	Y	Y	Y	N	Y	N	N	N	Y	N	Y	Y	Y
34	Solanaceae	Titbegun	*Solanum indicum*	S	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
35	Tiliaceae	Patshak	*Chorcorusolitorius*	H	N	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y
36	Verbinaceae	Bhat	*Clerodendrum inerme*	S	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y

Note: O = Observed, PR = Previous Record, LI = Local Information, Y =Yes, N = No, H = Herb, S = Shrub, T = Tree, VC = Very Common, C = Common, R = Rare, T = Threatened, NT = Not Threatened, U = Unknown, CT = Commercially Threatened, 1 = within CuEZL project site, 2 = adjacent areas of CuEZL project site.

B 5. THREATENED FLORA AND FAUNA

Some specific scientific category and criteria are followed to declare a species as threatened (critically endangered, endangered, etc.). It is generally declared by the World Conservation Union (IUCN), an international Inter Governmental Organization (IGO), for each country. Any species, under fauna, flora and fish that exist in threatened condition are generally known as threatened species. Currently 115 wildlife species (e.g., 38 Reptile, 10 Amphibia, 39 Bird and 28 Mammal) and 64 freshwater fish species are threatened in Bangladesh (IUCN-BD 2015). On the other hand, 486 floras are threatened [e.g. 36 Pteridophytes (V) and 293 Angiosperm (V), 1 Gymnosperm (EN) and 126 Angiosperm (EN), and 30 Angiosperm (CR)] in Bangladesh (Hasib, M.I. 2011).

However, no threatened flora was identified from the proposed CuEZL project site or its adjacent areas. On the other hand, no threatened fauna and fish species identified from the proposed CuEZL project site, but a total of seventeen threatened species (three faunal and fourteen fish) have been identified from the proposed CuEZL project adjacent areas (Table B.23). A systematic research work in different seasons of the year will provide a complete list of threatened fauna and fish species and their abundance and distribution within and adjacent to the proposed CuEZL project site. The list of identified threatened faunal and fish species, as per IUCN category and criteria, is presented in Table B.23.

Table B.23: List of Identified Threatened Faunal and Fish species that exist in areas adjacent to the CuEZL project site.

S. N.	Name			Habit	Status												Distribution	
	Biological Class	English	Scientific		Bangladesh											Global		
					RE	EX	EW	CR	EN	VU	NT	LC	DD	NE	CT		1	2
1	Reptilia	Bengal Monitor Lizard	*Varanus bengalensis*	T	N	N	N	N	N	N	Y	N	N	N	N	LC	N	Y
		Yellow Monitor Lizard	*Varanus salvator*	T	N	N	N	N	N	N	Y	N	N	N	N	LC	N	Y
2	Mammalia	Ganges River Dolphin	*Platanistagangetica*	A	N	N	N	N	N	Y	N	N	N	N	N	EN	N	Y
3	Osteichthyes (freshwater fish)	Asiatic Snakehead	*Channa orientalis*	A	N	N	N	N	N	Y	N	N	N	N	N	LC	N	Y
		Freshwater Shark	*Wallago attu*	A	N	N	N	N	N	Y	N	N	N	N	N	LC	N	Y
		Gangetic Goonch	*Bagarius bagarius*	A	N	N	N	Y	N	N	N	N	N	N	N	LC	N	Y
		Garua Bacha	*Clupisoma garua*	A	N	N	N	N	Y	N	N	N	N	N	N	LC	N	Y
		Gangetic Mudeel	*Monopterus cuchia*	A	N	N	N	N	N	Y	N	N	N	N	N	LC	N	Y
		Great Snakehead	*Channa marulius*	A	N	N	N	N	Y	N	N	N	N	N	N	LC	N	Y
		Grey Featerback	*Notopterus notopterus*	A	N	N	N	N	N	Y	N	N	N	N	N	LC	N	Y
		Humped Featherback	*Chitala chitala*	A	N	N	N	N	Y	N	N	N	N	N	N	LC	N	Y
		Indian Mottled Eel	*Anguilla bengalensis*	A	N	N	N	N	N	Y	N	N	N	N	N	LC	N	Y
		Long-whiskered Catfish	*Sperata aor*	A	N	N	N	N	N	Y	N	N	N	N	N	LC	N	Y
		Rita	*Rita rita*	A	N	N	N	N	Y	N	N	N	N	N	N	LC	N	Y
		Pabda Catfish	*Ompok pabda*	A	N	N	N	N	Y	N	N	N	N	N	N	LC	N	Y
		Scribbled Goby	*Awaous grammepomus*	A	N	N	N	N	N	Y	N	N	N	N	N	LC	N	Y
		Ticto / Firefin Barb	*Pethia ticto*	A	N	N	N	N	N	Y	N	N	N	N	Y	LC	N	Y

Note: T = Terrestrial, A = Aquatic, O = Observed, PR = Previous Record, LI = Local Information, Y =Yes, N = No, VC = Very Common, C = Common, R = Rare, RE = Regionally Extinct, EX = Extinct, EW = Extinct in the Wild, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern, DD = Data Deficient, NE = Not Evaluated, CT = Commercially Threatened, 1 = within CuEZL project site, 2 = adjacent areas of CuEZL project site..

B.6 ECOLOGICAL IMPORTANT SITE

Ecologically Critical Area (ECA)

It is an environmental protection zone, defined by the Government of Bangladesh under the Bangladesh Environment Conservation Act, 1995, where ecosystem is considered to be threatened to reach a critical state. The declaration states restrictions on hunting, fishing, all activities that could result in the destruction of floral or faunal habitats, activities that could destroy natural characteristics of water and soil, activities detrimental to fishery, installation of polluting industrial units, and discharge of domestic / industrial liquid waste into the river. No ECA exists at or near the proposed Cumilla Economic Zone Limited/ CuEZL project site.

Protected Area (PA)

An area of land and/or ocean especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means is referred to as "Protected Area (PA)". Such an area is predominantly a natural area established and managed in perpetuity, through legal or customary regimes, primarily to conserve their natural resources. No PA exists at or near the proposed CuEZL project site.

National Park (NP)

A National Park (NP) is a reserve land, usually declared and owned by a national government, protected from most human development activities and pollution. No NP exists at or near the proposed CuEZL project site.

Game reserve (GR)

A Game Reserve (GR) is an area of land set aside for maintenance of wildlife for tourism or hunting purposes. No GR exists at or near the proposed CuEZL project site.

Wildlife Sanctuary (WS)

A Wildlife Sanctuary (WS) is an area that assures the natural conditions necessary to protect nationally significant species, groups of species, biotic communities, or physical features of the environment where these require specific human manipulation for their perpetuation. No WS exists at or near the proposed CuEZL project site.

Fish Sanctuary

A Fish Sanctuary (FS) is a particular form of protected area in waters and considered to be an important and efficient managing device for protection, conservation and management of fisheries resources. No FS exists at or near the proposed CuEZL project site.

B 7. SOCIAL BASELINE

B 7.1 INTRODUCTION

A rapid socio-economic baseline study has been carried out for the proposed 'Cumilla Economic Zone Limited (CuEZL)' project of the Meghna Group of Industries (MGI), a private entrepreneur in Bangladesh. As noted earlier, the proposed CuEZL project is being established in a piece of char-land/ seasonally inundated agro-wet-land that has already been upraised though sand accumulation by the proponent (MGI), beside a tributary of Meghna River at Luterchar Union under Meghna Upazila of Cumilla District of Bangladesh (see Figure B.1).

To establish those components in the proposed CuEZL project area, various types of activities will be required with different dimensions and intensities, during construction and operation phases, and each/ all activities would have some impacts, either positive or negative, on the existing socio-economic environment; and therefore, will be required separate and detail component-based socio-economic safeguard studies, which is not covered by this socio-economic baseline study.

However, the objectives of socio-economic baseline study were to gather information on the existing socio-economic aspects which exist within and adjacent areas of the proposed CuEZL project site. The study has been conducted for the proposed CuEZL project and its development activities; not for the individual industrial activities (construction and operation phases) of the aforementioned major components.

This chapter describes the baseline socio-economic aspects which exist within and adjacent areas of the proposed CuEZL project study areas, based on field study, meetings with local communities, and findings of sample questionnaire surveys on the socio-economic aspects. Potential impacts for the proposed CuEZL project activities have been identified, evaluated and described against these socio-economic baseline situations in the relevant section of this EIA report with suggested mitigation measures as well as management and monitoring plans.

B. 7.2 APPROACH AND METHODOLOGY

The socio-economic field study covered an area of 10 km radius form the center point of the proposed CuEZL project site. Efforts were made to identify the socio-economic aspects that might be impacted by the proposed CuEZL project activities. A team consisting of four members have been engaged to collect the socio-economic aspects through field study, questionnaire survey, arranging meetings and associated works. The team interacted with more than hundred persons. The main purposes of the baseline socio-economic study were to primarily assess the:

(a) People's socio-economic condition;
(b) Extent of people's access to basic services; and
(c) People's perception regarding the proposed CuEZL project.

The social-economic aspects which exist within and adjacent areas of the proposed CuEZLproject site have been described below in detail, based on field observation, literature review and findings of the questionnaire survey.

B 7.3 SOCIO-ECONOMIC PERSPECTIVE OF THE CUEZL PROJECT SITE AND ADJACENT AREAS

B. 7.3.1 General Aspects of the Proposed Project Site:

As noted earlier, the proposed 'Cumilla Economic Zone Limited' project site was a char-land/seasonally inundated agro-wetland, beside a tributary of Meghna River, and recently, it has been upraised though sand accumulation by the proponent (MGI). Now the proposed land could be called as a sand-fill land instead of agro-wetland. The project site has already been bounded by concrete wall and fence; hence, entry is restricted there. No socio-economic activities observed there. It was known from the MGI that the CuEZL project site land has already been purchased from the private sources with full payment; hence, no people movement are now occuring there. The full-functional Meghna to Homna road passes through the middle of the CuEZL project site, and all sort of vehicles ply through every day. A few fruit-bearing and/ or timber yielding tree exist in the project site. Laborers collect the fuel-wood from the vegetative areas. No house, shop, educational or commercial structure, etc. exists in the project site. The project site looks like a barren sand-filled land. A large industrial structure is currently under construction by the MGI (for glass industry) beside a small section of Meghna-Homna road, within the proposed project site. The CuEZL site office and a couple of labor-sheds also were observed inside the proposed project site. Internal road and other associated works are ongoing. However, some socio-economic aspects within the proposed CuEZL project site are shown in Figures B.25.

(a) (b)

(c) (d)

(e) (f)

Figure B.25: Socio-economic aspects observed within the proposed CuEZL project site: (a) a small section of functional Meghna to Homna road with motorized CNG taxi, (b) Fuel wood collection by the laborers from CuEZL project site, (c) brick-chip making for internal road construction, (d) active electric line, (e) industrial structure under construction – for glass industry, and (f) temporary laborer shed.

(b) Project Adjacent Areas: The adjacent areas of the proposed CuEZL project site have various types of socio-economic aspects. Most areas have rural environment though few have industrial establishment that primarily exist beside Dhaka – Chottogram Highway. Most of the char-land seems to be fallow land during monsoon, but these lands become fertile agro-lands during non-monsoon season, and some of those lands are used for paddy and crop cultivation as well as for freshwater fish culture. All villages seem to be bounded by planted floras that have economic value to the human society. Most villages have fertile soil for growing short rotation crops and vegetables. Wood and Tin shed house are common in the villages beside concrete made one and two storied buildings.

The tributaries of Meghna River exist with plenty of aquatic resources, and local fishermen practice fishing there throughout the year. Most of the productive agro-lands are inundated in the rainy season for some months, and provide habitat for native fish species. Local community people catch fishes from those seasonal wetlands. Few ponds also exist in the villages, and people prefer to culture freshwater dependent fishes there. The villager rear cattle, poultry, pigeon, etc. inside the village vicinities. Various types of crops like piper, onion, okra, etc. are cultivated within the village vicinities. The main fuel sources for cooking are fire-wood, cow-dung stick, LG gas, etc. Electricity is available. Tube-wells exist in most houses. A tiny market also exists with a few shops, and people buy products from those shops for their daily needs.

The study site is mainly inhabited by the people of low to moderate income group. Muslims are the dominating community in the area. Most important occupation are small business, followed by farming. Meghna to Homna Road is the only road for terrestrial communication. Internal village road communication is bad. Only a few narrow clay roads and brick-laid roads exist. In most part of the surveyed area, limited number of motor cycle and CNG tri-cycle/ taxi are the main mode of transport for communication, beside country boat that are primarily used via tributary of Meghna River. Union Parishad (UP) Office with few other governmental institutions is not far away from the proposed CuEZL project adjacent areas. Few numbers of

religious and educational institutions exist. However, some socio-economic aspects of the proposed CuEZL project adjacent areas are shown in Figure B.26 to Figure B.30.

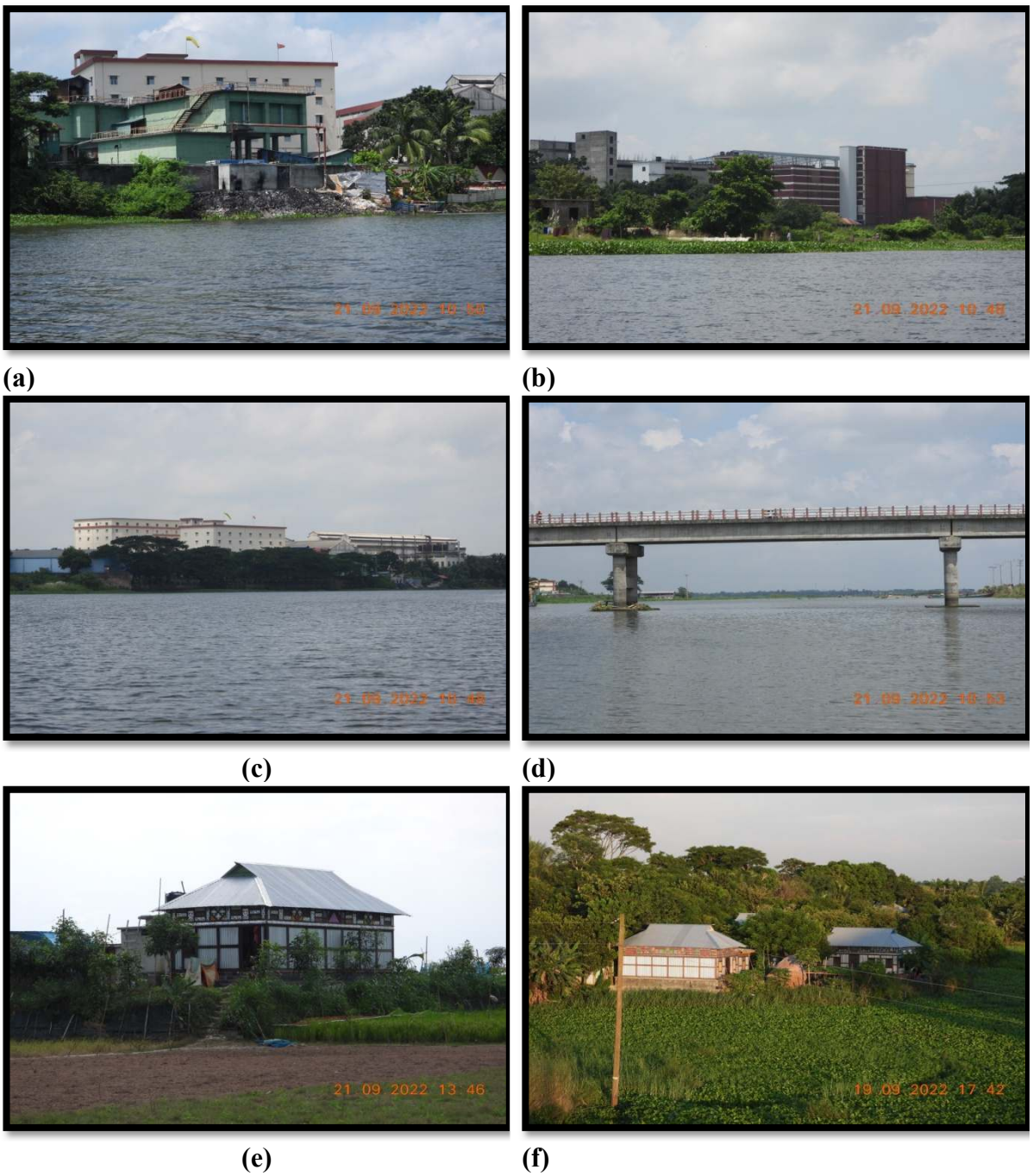


Figure B.26: Socio-economic aspects observed in the adjacent areas of proposed CuEZL project site: (a)to (c) various types of industry with active mode beside Meghna River tributary, near Dhaka to Chittagong Highway, (d) bridge over the Meghna River tributary – use for local terrestrial communication, (e) and (f) Tin-made house at char-land andvillage.

Figure B.27: Socio-economic aspects observed in the adjacent areas of proposed CuEZL project site: (a) and (b) duckand goat rearing in a village, (c) fodder collection from Meghna River tributary, (d) to (f) fishing inside the Meghna River tributary.

Figure B.28: Socio-economic aspects observed in the adjacent areas of proposed CuEZL project site: (a) electric pole with active electric line for villagers, (b) house-top satellite dish – use for entertainment, (c) cell phone tower for phone communication, (d) brickfield with brick production, (e) small bridge for local communication, and (f) tin-made residential house.

(a) **(b)**

(c) **(d)**

(e) **(f)**

Figure B.29: Socio-economic aspects observed in the adjacent areas of proposed CuEZL project site: (a)excavated soil transportation, by engine trawler, through Meghna River tributary, (b) sand transportation, by cargo-ship, through Meghna River tributary, (c) local market, source of essential goods and materials, (d) temporary kitchen market beside village road, (e) children playing football game, in from of a school, and (f) village women practice wash and bath in the Meghna River tributary.

Figure B.30: Socio-economic aspects observed in the adjacent areas of proposed CuEZL project site: (a) concrete-made modern mosque, a religious establishment, (b) typical village restaurant, (c) Guccho-gram, govt. created village for landless people beside Meghna River tributary, (d) industrial waste dumping, beside Meghna River tributary, (e) village toilet, and (f) Dhaka-Chittagong Highway, lifeline of district-to-district communication.

B 7.4. FINDINGS FROM SOCIO-ECONOMIC QUESTIONNAIRE SURVEY

A socio-economic questionnaire survey was carried out by the social surveyors (Figure B.31) of the project team in August 2022 for documenting the respondents existing socio-economic condition as well as their views, opinions and concerns regarding the proposed CuEZL project at their locality. The sample of questionnaire sheet has been provided in later. The

questionnaire survey was primarily carried out in public places within and adjacent areas of the proposed project site. Major findings from the survey are given below:

(a) **(b)**

(c) **(d)**

Figure B.31: Social surveyors filling out the questionnaire sheets by interviewing local people for the proposed 'Cumilla Economic Zone Limited' project.

B. 7.4.1 Socio-economic Aspects

All respondents for questionnaire survey were male; this is primarily due to the unavailability, unwillingness of female gender coupled with social custom in rural areas. Females generally stay inside the house and are generally unwilling to talk to outsiders. One third of all respondents' (33%) age was more than 55 years (Figure B.32). All respondents were Muslims (100%). Almost half of all respondents (44%) have primary level education, followed by secondary level education (33%) (Figure B.33). Most respondents are not happy with the overall quality of educational facilities available in their localities. Most respondents who have children reported that their children are studying in the local schools.

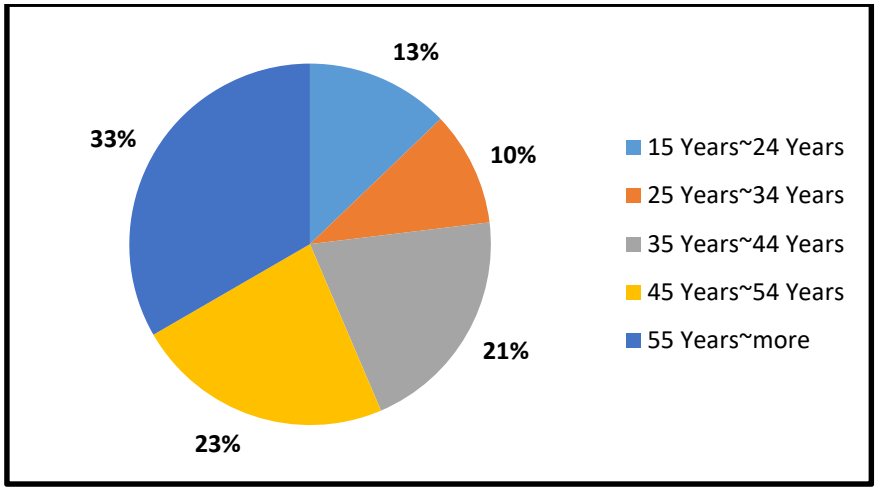


Figure B.32: Age structure of respondents who participated in the questionnaire survey for the proposed CuEZL project.

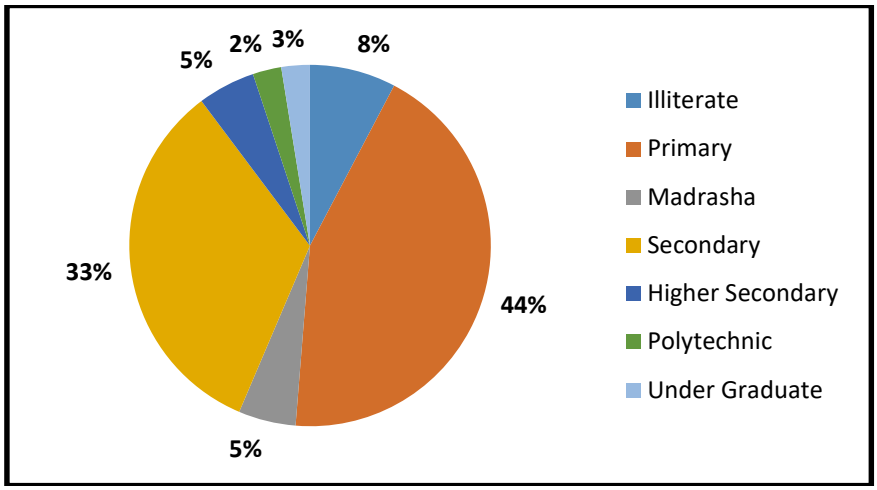


Figure B.33: Educational background of respondents in the questionnaire survey for the proposed CuEZL project.

The respondents have various occupations. More than half of all respondents (54%) represent run small business, followed by farming (23%) (Figure B.34). Economic condition of the respondents appears to be poor compared to other areas of Bangladesh. Respondents have mixed income range. More than half of all respondents (54%) have monthly income in between Taka ten thousand to twenty thousand, followed by Taka twenty thousand to thirty thousand (10%) (Figure B.35).

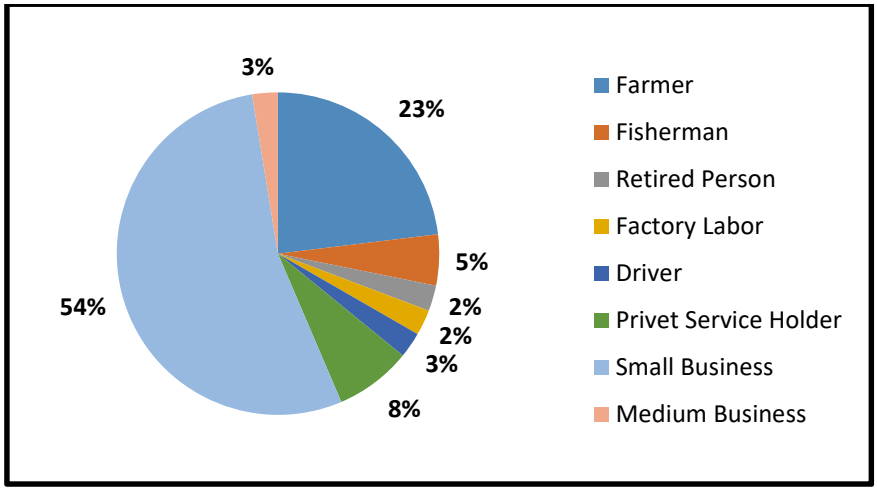


Figure B.34: Occupation of respondents who participated in the questionnaire survey for the proposed CuEZL project.

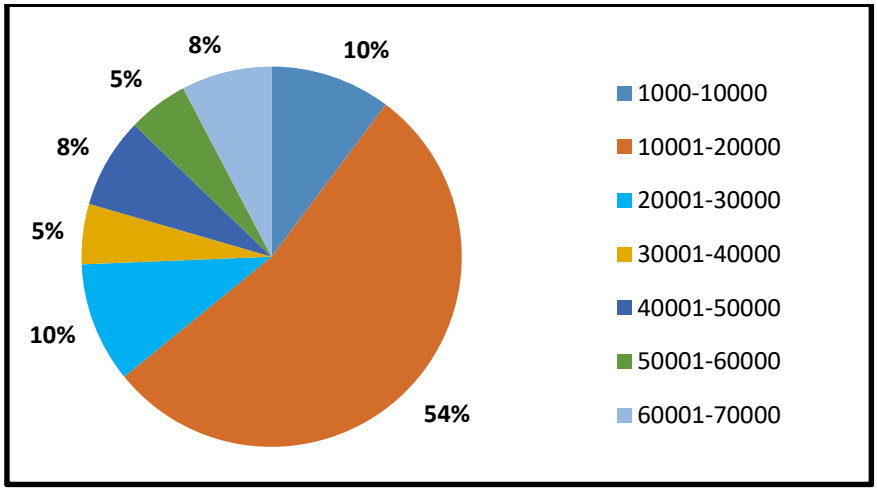


Figure B.35: Monthly income (in BDT) of respondents who participated in the questionnaire survey for the proposed CuEZL project.

B.7.4.2 Resource Efficiency and Pollution Prevention and Management (PS 3)

All respondents have access to electricity at their houses and other commercial activities. Most respondents (87%) have no access to piped gas supply system/network for cooking. They primarily use firewood (74%). Almost all respondents (95%) have no access to piped water supply system. They use tube-well, pond and river water. Most respondents (82%) opined that the area is not an arsenic contaminated area. On the other hand, iron contamination is almost nil, according to almost all respondents (97%). Since there is no sewer system, pit latrine is the on-site sanitation technology adopted by the locals. More than three-fourth of all respondent (79%) opined that the road communication system is satisfactory.

B.7.4.3 Community Health and Safety (PS 4)

Almost all respondents (92%) had no accident/injury record in the last six month. In case of emergency they seek treatment at the government hospital. More than one-fourth of all respondents (26%) have suffered from some sort of diseases in the last six month; primarily fever (70%), and took treatment at the nearby pharmacy and at the government hospital. Unfortunately, almost all of them (95%) are unhappy with the treatment facilities available at present.

The CuEZL authority has put in place its own security system entrusted with the responsibility of providing safety and security to its personnel inside the Economic Zone. It is likely that untoward incidents will occur between the security guards and the villagers. However, none of the respondents alleged any such untoward incident. But they are not aware of any complaint management mechanism to address the conflict if it occurs.

B.7.4.4 Land Acquisition, Restrictions on Land and Involuntary Resettlement (PS 5)

Almost all respondents (95%) have been living in the area more than 21 years (Figure B.36). As majority of the respondents have been staying in the area for long time, it means that they have most likely developed many kinds of social and economic ties with other people who are living in that area. Therefore, any displacement would affect, not only their income, but also other social and economic relationships. It should be noted that land acquisition has already been completed by the MGI for CuEZL project; hence, land related impact to the local community will be low as it has already been settled.

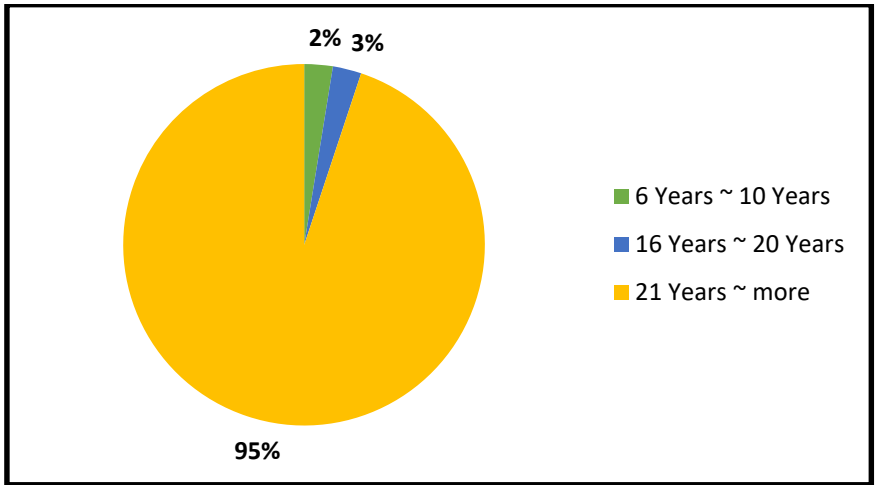


Figure B.36: Living duration of the respondents who participated in the questionnaire survey for the proposed CuEZL project.

Before interaction with the field social team, most respondents (90%) have heard about the current initiatives of CuEZL Project by MGI, but were not familiar with the number/ names of industries to be established at their locality. This means that proper information have not yet been disseminated widely to the local community. More than three-fourth of all respondents (77%) knows that private land will be acquired for the proposed project. Almost half of all respondents (44%) have already handed over their lands to the MGI for CuEZL project, and most of them (88%) have already received compensation payments for the acquired lands. Few

respondents (15%) have to relocate for the CuEZL project. More than one-third of all respondents (64%) opined that proposed CuEZL project site was used as agricultural land before sand-filling by MGI, while others (36%) opined that some of CuEZL land was also used as fallow land. Before sand-filling, few respondents (18%) regularly used the proposed CuEZL project land as agricultural land. All respondents opined that no historical or archaeological establishment exists within the 10 km, surrounding the proposed CuEZL project site. All respondents (100%) were supportive for the proposed CuEZL project at their locality, and had multiple supportive attitudes (Figure B.37).

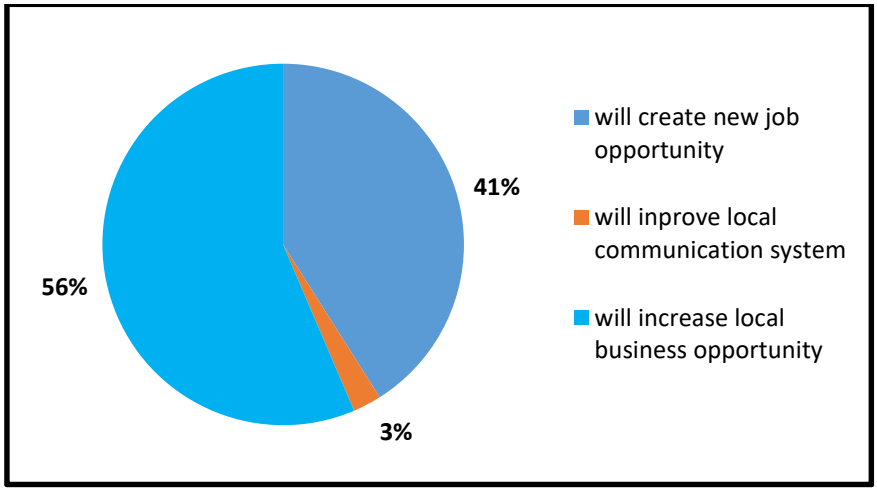


Figure B.37: Percentage of respondents' supportive attitude for the proposed CuEZL project.

An existing village road, from village to river, is now closed for the CuEZL project boundary; establishment of new road is required - outside of the CuEZL project boundary wall; otherwise, demand will be created to pay compensation to the PAPs for closing that road

Consultation Meeting with the Land Owners:

Following advertisements in Daily Jugantor and Financial Express on June 02, 2021 a consultation meeting was held at the premises of the Comilla Economic Zone Ltd on 19th June, 2021. The meeting was led by Mr. Karti Chandra Das as Chairperson. A total of 24 land sellers attended the meeting. The meeting was primarily aimed at exchanging views with the sellers of the lands to the CuEZL authority for development of the economic zone. Three important questions were posted to the land sellers which are whether they have sold the land to CuEZL willingly or not; whether they received their entire payment as per the agreement; and what is their opinion on the proposed CuEZL project? The land sellers affirmed that they have not been forced or coerced to sell their lands and have willingly sold the lands to CuEZL. They also confirmed that they have received full payments for their land when the registration was finalized. Mr. Deluwar Hossain Khan, Mr. Habibur Rahman and Mrs. Panna Begum didn't want to sell the land at first, but, when they realized that CuEZL is expected to provide job opportunities and will contribute to the overall development of the locality, they decided to sell their lands to the CuEZL authority. The attendees had a general expectation that local people will get priority in job offerings at the CuEZL and there will be significant social development in the form of playgrounds, schools, hospitals, etc. The documents related to the land purchase,

land purchase process, land deeds, some payment slips, consultation meeting and its attendees are provided in Annex H.

B.7.4.5 Biodiversity Conservation and Sustainable Management of Living Natural Resources (PS 6)

Local environment has already been changed badly due to sand-filling as well as destruction of peripheral floras beside river tributary. Various types of fish exist in the Meghna River and tributaries, adjacent to the CuEZL project site; fish production, fish availability in those water-bodies will be reduced due to the proposed CuEZL project activities. Regarding floral issue, most respondents (92%) opined that proposed project may remove all floras from the project site; hence, some impact will occur in their locality. Regarding faunal issue, more than one third of all respondents (41%) opined that onsite faunal population will be compelled to leave the area, and other respondents (33%) opined that onsite faunal population number will decrease. Regarding fish issue, around three-fourth of all respondents (72%) opined that local fish number will be decreased, while other respondents (21%) opined that fish habitat will be decreased as well as fish community will be compelled to leave the area.

B.7.4.6 Indigenous Peoples (PS 7)

The field survey as well as discussion with local people and elderly residents around the project area indicate that there is no existence of indigenous people in and around the project area. In addition, no historical reference of any indigenous people living around the area could be found.

B.7.4.7 Cultural Heritage (PS 8)

All respondents (100%) opined that no historical or archaeological structure / town exist within the 10 km radius of CuEZL project site. Around two-third respondents (64%) opined that an ancient / historical city, known as PANAM CITY, exist about 13 km from the CuEZL project site, and remaining respondents (15%) opined that many historical items exist in a museum near their locality. More than a quarter of the respondents (27%) opined that the historical / archaeological structure / town is a conservation area and are being conserved by Archaeological Department of Bangladesh Government, other respondents (40%) have no knowledge of conservation of this ancient town / museum.

B.7.4.8 Perception on Future Industries at proposed CuEZL project

Physical environment related issues:

Almost three-fourth of all respondents (72%) opined that air will be polluted by various types of particles for implementation of the CuEZL project. Regarding soil, more than three-fourth of all respondents (82%) opined that local land price will be higher than the present time at their locality; some respondents (8%) opined that land use pattern will be changed, and others (5%) opined that no impact will be occurred for this project. Regarding noise pollution, most respondents (90%) opined that noise will be generated in various degrees during and after

construction of CuEZL project. Most respondents (82%) opined that river/ surface water pollution will be occurred for the proposed CuEZL project,

Ecological environment related issues

Regarding floral issue, most respondents (92%) opined that proposed project may remove all floras from the project site; hence, some impact will occur in their locality. Regarding faunal issue, more than one third of all respondents (41%) opined that onsite faunal population will be compel to leave the area, and other respondents (33%) opined that onsite faunal population number will be decrease. Regarding fish issue, around three fourth of all respondents (72%) opined that local fish number will be decreased, while other respondents (21%) opined that fish habitat will be decreased as well as fish community will compel to leave the area.

Social environment related issues

All respondents opined that proposed CuEZL project will affect their future life and livelihood by various ways (Figure B.39). Almost two-third of all respondents (60%) opined that local/ village environment will be degraded for the proposed CuEZL project. Most respondents (92%) opined that road traffic will increase in the Dhaka-Chittagong Highway – near CuEZL project site, which ultimately affect their movement via this highway. Accident will also increase in the local road, according to all respondents.

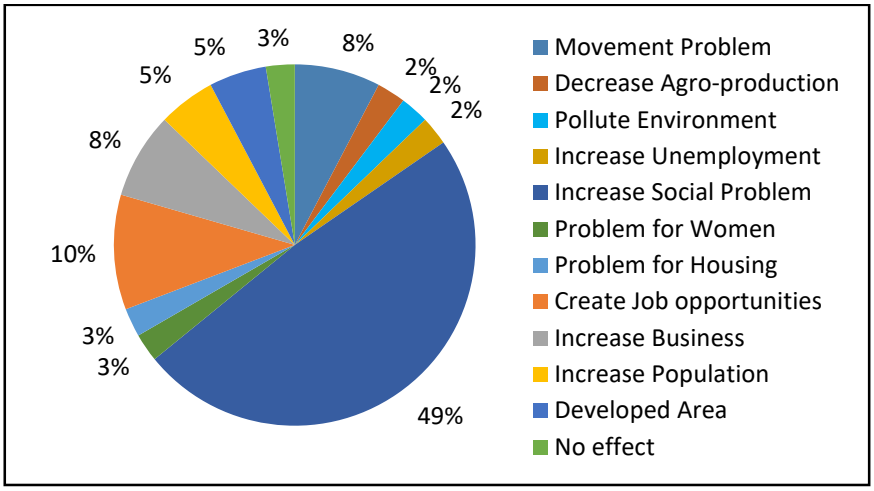


Figure B.39: Percentage of respondents' opinion regarding future effect of the proposed CuEZL project to them and their locality.

B.7.5 SOCIAL AUDITING

As mentioned earlier, the CuEZL is not functional yet. Construction works of an administrative wing and two industries (Meghna Steel and Re-Rolling Industry and Meghna Glass Industry) are ongoing, at present. Therefore, no social auditing campaign could be conducted. However, a sampling protocol and data collection scheme along with the questionnaire is provided in Annex F. Once the industries of the CuEZL becomes operational these may be used to conduct the social auditing campaign.

ANNEX C
POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

C.1 INTRODUCTION

The proposed project will be implemented in compliance with applicable environmental laws and regulations. Bangladesh has an environmental legal framework that is conducive to both environmental protection and natural resources conservation. This environmental legal framework applies to the proposed project. In addition, a wide range of laws and regulations related to environmental issues are in place in Bangladesh. Many of these are cross-sectoral and partially related to environmental issues. This Section presents an overview of the major national environmental laws and regulations that are relevant and may apply to activities supported by the proposed project, and World Bank safeguard policies.

The GoB has developed a policy framework that requires environmental issues to be incorporated into economic development planning. The key tenets of the various applicable policies are incorporated in the WBG Performance Standards (PSs), detailed discussion and the applicability of these PSs are given below.

C.2 RELEVANT INTERNATIONAL REGULATIONS, GUIDELINES AND CONVENTIONS

C.2.1 World Bank Performance Standards for Private Sector Projects

In order to facilitate the World Bank's support private sector led projects through application of environmental and social policy standards that are better suited to the private sectors, as well as to enhance greater policy coherence and cooperation across the World Bank Group, the Board of Executive Directors decided to adopt the eight (08) updated IFC Performance Standards. In doing so the World Bank environmental and social safeguard policies and procedures were replaced by the IFC Performance Standards to Bank support for projects (or components thereof) that are owned, constructed and/or operated on a commercial basis by Private Entity. To provide consistent approaches to the private sector investors the World Bank Group developed the Operational Policies (OP) 4.03 which closely parallel procedures followed by the IFC environmental and social specialists during project preparation and supervision. This OP 4.03 depicts the circumstances under which the WB Performance Standards may be applied, the roles and responsibilities of the Private Entity implementing the project and of the Bank in supporting environmental and social sustainability aspects of the project.

C.2.1.1 Performance Standards for Private Sectors

As per the World Bank financing guidelines, the CuEZL project should conform to specific rules, regulations, and standards. The World Bank operational guideline Performance Standards for Private Sector Activities (OP 4.03) is primarily applicable for this project. The aim of this particular policy is to facilitate World Bank financing for private sector-led

economic development projects so that, the project would comply with environmental and social policy standards. There are eight key Performance Standards against which the impacts of the project would be evaluated to identify the impacts and affected stakeholders to help with the preparation of the management and mitigation plan. These Performance Standards (PSs) along with their applicability in the CuEZL project are listed in Table C.2-1.

Performance Standard 1: Assessment and Management of Environment and Social Risks and Impact

PS1 is focused on the management of environmental and social impacts and risks observed throughout the project duration. An effective Environmental and Social Management System (ESMS) is the key to attain the goal of PS1. The ESMS should be formulated through the involvement of the client, its workers, the local communities directly affected by the project and other stakeholders involved. The good ESMS, appropriate to the nature and scale of the project promotes sound and sustainable environmental and social performance. It can also lead to improved financial, social and environmental outcomes.

Applicability

PS 1 is applicable to the CuEZL project. Since the CuEZL area will host various manufacturing industry, the operation of these industries will be associated with environmental and social impacts including water pollution from industrial wastewater discharge, air pollution from emission among others. As a result, PS1 will be applicable to the proposed CuEZL project.

Performance Standard 2: Labor and Working Conditions

PS2 is focused on the protection of the fundamental rights of workers in a development project. Employment creation and income generation associated with the economic growth often may have lacking in workers' rights protection resulting in an unsustainable worker-management relationship that may undermine the worker commitment and retention. The PS2 set out certain requirements that would promote the protection of workers' rights and safe and healthy working conditions.

Applicability

PS 2 is applicable to CuEZL project. The proposed project will involve the employment of limited number of direct and contractual workers during construction and operation phases. The investors who will develop industries in the economic zone will also involve direct and/or contractual employees. Subsequently, PS2 would be applicable to this project to ensure the labor rights protection, proper working conditions and labor health and safety.

Performance Standard 3: Resources Efficiency and Pollution Prevention

PS3 recognizes that increased economic activities and urbanization often generate increased levels of pollution to air, water, and land, and consumes finite resources in a manner that may threaten people and the environment at local, regional and global levels. There is a growing global consensus that the current and projected atmospheric concentration of greenhouse gases

(GHG) threatens the public health and welfare of current and future generations. PS3 formulates the project-level methods for efficient and sustainable resource utilization, pollution prevention, avoidance of GHG emission, and mitigation or avoidance of these impacts.

Applicability

The CuEZL project area will host a number of industries that would utilize resources, and generate and emit pollutants to water, air, and land. These emissions may lead to environmental impacts and increase in GHG emissions. As a result, PS 3 is applicable to the proposed CuEZL project.

Performance Standard 4: Community Health, Safety, and Security

PS4 recognizes that project activities, equipment, and infrastructure can increase community exposure to risks and impacts. In addition, communities that are already subjected to impacts from climate change may also experience an acceleration and/or intensification of impacts due to project activities. This Performance Standard would focus to avoid or minimize the risks and impacts to community health, safety, and security that may arise from project related-activities, with particular attention to vulnerable groups.

Applicability

PS 4 is applicable to the project. If the discharge from the industries in the CuEZL area, reach the nearby local water sources untreated, it would alleviate the risks of exposure to the community. Similarly, some industrial processes may include hazardous materials whose improper disposal and handling may also pose a threat to the nearby community. Transportation of the raw materials and finished goods from the project area through the nearby communities would also pose safety risk to the community. Subsequently, the PS4 is applicable for the CuEZL project.

Performance Standard 5: Land Acquisition and Involuntary Resettlement

Performance Standard 5 recognizes that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons that use this land. Involuntary resettlement refers both to physical displacement (relocation or loss of shelter) and to economic displacement (loss of assets or access to assets that leads to loss of income sources or other means of livelihood) as a result of project-related land acquisition and/or restrictions on land use. Resettlement is considered involuntary when affected persons or communities do not have the right to refuse land acquisition or restrictions on land use that result in physical or economic displacement. This occurs in cases of (i) lawful expropriation or temporary or permanent restrictions on land use and (ii) negotiated settlements in which the buyer can resort to expropriation or impose legal restrictions on land use if negotiations with the seller fail.

Applicability

The proposed project land has already been purchased by the CuEZL authority. As a result, no further land acquisition and involuntary resettlement are necessary for this project. Henceforth, the PS5 is not applicable to the CuEZL project.

Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

PS 6 recognizes that protecting and conserving biodiversity, maintaining ecosystem services and sustainably managing living natural resources are fundamental to sustainable development. The Performance Standard addresses how the impacts on biodiversity and ecosystem services can be managed and mitigated throughout the project's lifecycle.

Applicability

PS 6 is applicable to the proposed CuEZL project. The wastes during the construction phase may pollute the nearby river and freshwater echo-system. Similarly, the industrial discharge may affect the freshwater ecosystem, if discharged untreated. Hence the PS6 is applicable to the CuEZL project.

Performance Standard 7: Indigenous Peoples

Performance Standard 7 recognizes that Indigenous Peoples, as social groups with identities that are distinct from mainstream groups in national societies, are often among the most marginalized and vulnerable segments of the population. Indigenous Peoples are particularly vulnerable if their lands and resources are transformed, encroached upon, or significantly degraded. Their languages, cultures, religions, spiritual beliefs, and institutions may also come under threat.

Applicability

There is no settlement of indigenous people within the project boundary. Hence, PS7 is not applicable to the proposed CuEZL project.

Performance Standard 8: Cultural Heritage

Performance Standard 8 recognizes the importance of cultural heritage for current and future generations. Consistent with the Convention Concerning the Protection of the World Cultural and Natural Heritage, the aim of PS8 is to ensure the protection of cultural heritage in the course of the project activities.

Applicability

There are historical places rich archaeological treasures in the Sonargaon Upazilla near the project area. Earthwork and excavation during the construction phases of the industries in the project areas might expose buried Physical Cultural Resources (PCR). Subsequently, PS8 is applicable to the proposed CuEZL project.

C.2.1.2 Triggering of WB PS in CuEZL

The triggering of the WBG Performance Standards (PS) in the present project with explanations are given in the Table C.2-1 below. The applicable GOB laws, Rules, Policies, and Guidelines are listed alongside the WBG PS. The International Conventions signed by Bangladesh are also included, as once signed these are equivalent to the laws.

Table C.2-1: Triggered WBG Performance Standard (PS) in the Project

Sl.	PS and Title	Triggered (Yes/No)	Applicable Bangladesh Laws/Rules and Conventions to which Bangladesh is a Party
1	**Performance Standard 1:** Assessment and Management of Environmental and Social Risks and Impacts	Yes	Bangladesh Environmental Conservation Act (ECA '95), 1995 and amendments; Environment Conservation Rules (ECR), 2023; National Environmental Policy, 2018 & 1992; Environmental Court Act, 2010; National Environmental Management Action Plan, 1995, National Water Policy, 2000; Air Pollution Control Rules, 2022; National Water Management Plan, 2001
Explanations: PS1 is triggered in this project. This is an umbrella Standard as Assessment and Management of Environmental and Social Risks and Impacts are important in all projects with land-based activities (i.e., during construction, operation and decommissioning phases). The issues that may pose potential E&S risks and/or impacts include air emissions, water pollution, wastes and effluents and engagement of labor etc. These issues have to be assessed to determine the extent of the risks and impacts.			
2	**Performance Standard 2:** Labor and Working Conditions	Yes	Bangladesh Factories Act (1965); Bangladesh Labor Act, 2006; Bangladesh Labor Rules (2015), Bangladesh Children's Act 2013; ILO Conventions 29, 87, 98, 100, 105, 111 and 182
Explanations: PS2 is triggered in this project; as during all phases of the project labor force will be needed and mobilized to carry out various duties to construct and operate the project. It is therefore necessary for the Project to maintain appropriate labor and working conditions.			
3	**Performance Standard 3:** Resource Efficiency and Pollution Prevention	Yes	*ECA95 and amendments, ECR 23; Noise Pollution (Control) Rules 2006, Air Pollution Control Rules, 2022;* International Convention for the Prevention of Pollution of the Sea by Oil, London, 1954 (Ratified 1981); *The Ground Water Management Ordinance, 1985;* Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal, Basel, 1989 (Ratified 1993); Montreal Protocol on Substances that Deplete the Ozone Layer, Montreal, 1987 (Ratified 1990), (London Amendment, 1990) (Ratified 1994).
Explanations: PS2 is triggered in this project; as it will involve use of a lot of resources both raw, semi-manufactured, manufactured components and energy. Thus, pollutants will be produced and these need to be minimized to comply with standards; resources and energy conservation are also prime needs. Construction works are likely to generate wastes during the construction phase. In addition, operational effluent discharges including associated emissions may have pollution potentials. In addition, the DSP will depend on resources / raw material inputs such as natural and manufactured resources. PS3 is triggered.			

4	**Performance Standard 4**: Community Health, Safety, and Security	Yes	*The Fertilizer Regulation Order, 1995;* Disaster Management Act 2012; Motor Vehicle Ordinance 1983; Bangladesh Private Security Regulations Act, 2006.
Explanations: PS4 is triggered in the project. Area around the project site is already developed with numerous heavy industries. There is considerable number of households, villages and local communities in the 3km impact zone around the site. It is also located beside the busiest National Highway. With increased activities in the project area following construction of various industries, there will be influx of workers and service providers, which will add to the local communities; who will be impacted by the activities in the industries within the site. Although the project is likely to be beneficial to entrepreneur and stakeholders, some beneficial impacts are also expected to the community e.g. employment as well as negative impacts e.g. fire and explosion risks, accidents, etc.			
5	**Performance Standard 5:** Land Acquisition and Involuntary Resettlement	No	Acquisition and Requisition of Immovable Property Act, 2017
Explanations: The land on which CuEZL project is located has been purchased by MGI. The land has been earmarked for development for economic zone. The Bangladesh Economic Zone Authority (BEZA) has published a gazette granting permission to develop an economic zone on the above mentioned land (details in Annex H). There is no further land acquisition and involuntary Resettlement. Hence PS5 is not applicable.			
6	**Performance Standard 6:** Biodiversity Conservation and Sustainable Management of Living Natural Resources	Yes	*Bangladesh Wild Life (Preservation) Act, 1974; National Biodiversity Strategy and Action Plan (2004):* Fish Act and Rules, Bangladesh Water Act 2013; National Water Bodies Protection Act 2000, National Conservation Strategy, 1992, ECA95, National Water Policy, 2000; National Water Management Plan, 2001; International Plant Protection Convention, Rome, 1951 (Ratified 1978); Convention on Wetlands of International Importance, especially as Waterfowl Habitat, Ramsar, 1971; the Ramsar Convention (Ratified 1992); Convention on International Trade in Endangered Species of Wild Fauna and Flora, Washington, 1973 (CITES Convention) (Ratified 1982); Agreement on the network of Aquaculture Centers in Asia and Pacific (NACA), 1988; Convention on Biological Diversity, Rio de Janeiro, 1992 (Ratified 1994); International Convention to Combat Desertification, 1994.
Explanations: PS6 is triggered in the project as the issues involved are universal. The area was lowland and was dredge-filled, before it was taken up for development. There are significant biological or ecological issues in the area, however, the area has changed significantly for the development.			
7	**Performance Standard 7:** Indigenous Peoples	No	Chittagong Hill Tracts Regional Council Act, 1998.
Explanations: PS7 is not triggered in the project. There are no indigenous people in the impact zone of the project.			
8	**Performance Standard 8:** Cultural Heritage	No	Antiquities Act, 1968; Convention Concerning the Protection of the World Cultural and Natural Heritage, Paris, 1972 (World Heritage Convention) (Ratified 1983).
Explanations: Based on current knowledge, there is no area with significant cultural heritage in and around the project area. However, there are historical places rich archaeological treasures in the Sonargaon Upazilla near the project area. Earthwork and excavation during the construction phases of the industries in the project areas might expose buried Physical Cultural Resources (PCR). In that case, PS8 may be applicable to the proposed CuEZL project and hence, any chance find will be dealt with using standard procedure and the PS8 will be triggered.			

C.2.2 Fundamental Conventions of ILO

The ILO Governing Body has identified eight "fundamental" Conventions, covering subjects that are considered to be fundamental principles and rights at work: freedom of association and the effective recognition of the right to collective bargaining; the elimination of all forms of forced or compulsory labor; the effective abolition of child labor; and the elimination of discrimination in respect of employment and occupation. These principles are also covered by the ILO Declaration on Fundamental Principles and Rights at Work (1998). As of 1st January 2019, there were 1,376 ratifications of these Conventions, representing 92 per cent of the possible number of ratifications. At that date, a further 121 ratifications were still required to meet the objective of universal ratification of all the fundamental Conventions.

1) Freedom of Association and Protection of the Right to Organize Convention, 1948 (No. 87)
2) Right to Organize and Collective Bargaining Convention, 1949 (No. 98)
3) Forced Labor Convention, 1930 (No. 29) (and its 2014 Protocol)
4) Abolition of Forced Labor Convention, 1957 (No. 105)
5) Minimum Age Convention, 1973 (No. 138)
6) Worst Forms of Child Labor Convention, 1999 (No. 182)
7) Equal Remuneration Convention, 1951 (No. 100)
8) Discrimination (Employment and Occupation) Convention, 1958 (No. 111)

Government of Bangladesh has ratified 5 conventions, namely Nos. 87, 98, 29, 105 and 111 in the year 1972. Also, the conventions No. 100 and 182 were ratified in years 1998 and 2001, respectively. Although the Government of Bangladesh has ratified the convention on Worst Forms of Child Labor (No. 100) it is yet to ratify the convention No. 138 (Minimum Age Convention).
(Ref.:https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:10011:::NO:10011:P10011_DISPLAY_BY,P10011_CONVENTION_TYPE_CODE:1,F)

Freedom of Association and Protection of the Right to Organize Convention, 1948 (No. 87)

The Governing Body of the International Labor Office met in its Thirty-first Session on 17 June 1948 and decided to adopt, in the form of a Convention, certain proposals concerning freedom of association and protection of the right to organize. The Constitution of the International Labor Organization declared "recognition of the principle of freedom of association" to be a means of improving conditions of labor and of establishing peace. The Declaration of Philadelphia reaffirmed that "freedom of expression and of association are essential to sustained progress". The International Labor Conference unanimously adopted the principles which should form the basis for international regulation.

Part I of the Convention No. 87 is "Freedom of Association" which ensures the rights of laborers to join organizations of their own choosing without previous authorization which is depicted through Articles 1 through 10. Part II of the Convention No. 87 is "Protection of the

Right to Organize". Article 11 states that each member of the International Labor Organization for which this Convention is in force undertakes to take all necessary and appropriate measures to ensure that workers and employers may exercise freely the right to organize.

Right to Organize and Collective Bargaining Convention, 1949 (No. 98)

The Governing Body of the International Labor Office met in its Thirty-second Session on 8 June 1949, and decided to adopt certain proposals concerning the application of the principles of the right to organize and to bargain collectively.

Details of this Convention are given through Articles 1 through 16. The predominant condition is that workers shall enjoy adequate protection against acts of anti-union discrimination in respect of their employment. It states that such protection shall apply more particularly in respect of acts calculated to:

a) make the employment of a worker subject to the condition that he shall not join a union or shall relinquish trade union membership;
b) cause the dismissal of or otherwise prejudice a worker by reason of union membership or because of participation in union activities outside working hours or, with the consent of the employer, within working hours.

Forced Labor Convention, 1930 (No. 29) (and its 2014 Protocol)

The Governing Body of the International Labor Office met in its Fourteenth Session on 10 June 1930, and decided upon the adoption of certain proposals with regard to forced or compulsory labor, which is included in the first item on the agenda of the Session. Details of this convention are provided in Articles 1 through 33. It primarily states that Each Member of the International Labor Organization which ratifies this Convention undertakes to suppress the use of forced or compulsory labor in all its forms within the shortest possible period. With a view to this complete suppression, recourse to forced or compulsory labor may be had, during the transitional period, for public purposes only and as an exceptional measure, subject to the conditions and guarantees hereinafter provided.

Abolition of Forced Labor Convention, 1957 (No. 105)

The Governing Body of the International Labor Office met in its Fortieth Session on 5 June 1957 and considered the question of forced labor and noted the provisions of the Forced Labor Convention, 1930, and noted that the Slavery Convention, 1926, provides that all necessary measures shall be taken to prevent compulsory or forced labor from developing into conditions analogous to slavery and that the Supplementary Convention on the Abolition of Slavery, the Slave Trade and Institutions and Practices Similar to Slavery, 1956, provides for the complete abolition of debt bondage and serfdom.

It also noted that the Protection of Wages Convention, 1949, provides that wages shall be paid regularly and prohibits methods of payment which deprive the worker of a genuine possibility of terminating his employment, and decided upon the adoption of further proposals with regard to the abolition of certain forms of forced or compulsory labor constituting a violation of the

rights of man referred to in the Charter of the United Nations and enunciated by the Universal Declaration of Human Rights, and determined that these proposals shall take the form of an international Convention. Details of this convention are provided in Articles 1 through 10. It primarily states that, each Member of the International Labor Organization which ratifies this Convention undertakes to suppress and not to make use of any form of forced or compulsory labor:

a) as a means of political coercion or education or as a punishment for holding or expressing political views or views ideologically opposed to the established political, social or economic system;
b) as a method of mobilizing and using labor for purposes of economic development;
c) as a means of labor discipline;
d) as a punishment for having participated in strikes;
e) as a means of racial, social, national or religious discrimination.

Minimum Age Convention, 1973 (No. 138)

The Governing Body of the International Labor Office met in its Fifty-eighth Session on 6 June 1973 and decided upon the adoption of certain proposals with regard to minimum age for admission to employment. The terms of the Minimum Age (Industry) Convention, 1919, the Minimum Age (Sea) Convention, 1920, the Minimum Age (Agriculture) Convention, 1921, the Minimum Age (Trimmers and Stokers) Convention, 1921, the Minimum Age (Non-Industrial Employment) Convention, 1932, the Minimum Age (Sea) Convention (Revised), 1936, the Minimum Age (Industry) Convention (Revised), 1937, the Minimum Age (Non-Industrial Employment) Convention (Revised), 1937, the Minimum Age (Fishermen) Convention, 1959, and the Minimum Age (Underground Work) Convention, 1965, and Considering that the time has come to establish a general instrument on the subject, which would gradually replace the existing ones applicable to limited economic sectors, with a view to achieving the total abolition of child labor and determined that these proposals shall take the form of an international Convention.

Details of this convention are provided in Articles 1 through 18. It primarily states that, each Member for which this Convention is in force undertakes to pursue a national policy designed to ensure the effective abolition of child labor and to raise progressively the minimum age for admission to employment or work to a level consistent with the fullest physical and mental development of young persons.

Each Member which ratifies this Convention shall specify, in a declaration appended to its ratification, a minimum age for admission to employment or work within its territory and on means of transport registered in its territory; subject to Articles 4 to 8 of this Convention, no one under that age shall be admitted to employment or work in any occupation.

Worst Forms of Child Labor Convention, 1999 (No. 182)

The Governing Body of the International Labor Office met in its 87th Session on 1 June 1999 an considered the need to adopt new instruments for the prohibition and elimination of the

worst forms of child labor, as the main priority for national and international action, including international cooperation and assistance, to complement the Convention and the Recommendation concerning Minimum Age for Admission to Employment, 1973, which remain fundamental instruments on child labor. It also considering that the effective elimination of the worst forms of child labor requires immediate and comprehensive action, taking into account the importance of free basic education and the need to remove the children concerned from all such work and to provide for their rehabilitation and social integration while addressing the needs of their families.

Details of this convention are provided in Articles 1 through 18. It primarily states that, each Member which ratifies this Convention shall take immediate and effective measures to secure the prohibition and elimination of the worst forms of child labor as a matter of urgency. For the purposes of this Convention, the term child shall apply to all persons under the age of 18. For the purposes of this Convention, the term the worst forms of child labor comprises:

a) all forms of slavery or practices similar to slavery, such as the sale and trafficking of children, debt bondage and serfdom and forced or compulsory labor, including forced or compulsory recruitment of children for use in armed conflict;
b) the use, procuring or offering of a child for prostitution, for the production of pornography or for pornographic performances;
c) the use, procuring or offering of a child for illicit activities, in particular for the production and trafficking of drugs as defined in the relevant international treaties;
d) work which, by its nature or the circumstances in which it is carried out, is likely to harm the health, safety or morals of children.

Equal Remuneration Convention, 1951 (No. 100)

The Governing Body of the International Labor Office met in its Thirty-fourth Session on 6 June 1951 and decided upon the adoption of certain proposals with regard to the principle of equal remuneration for men and women workers for work of equal value. Details of this convention are provided in Articles 1 through 14.

For the purpose of this Convention:

a) the term **remuneration** includes the ordinary, basic or minimum wage or salary and any additional emoluments whatsoever payable directly or indirectly, whether in cash or in kind, by the employer to the worker and arising out of the worker's employment;
b) the term **equal remuneration for men and women workers for work of equal value** refers to rates of remuneration established without discrimination based on sex.

Discrimination (Employment and Occupation) Convention, 1958 (No. 111)

The Governing Body of the International Labor Office met in its Forty-second Session on 4 June 1958 and decided upon the adoption of certain proposals with regard to discrimination in the field of employment and occupation and determined that these proposals shall take the form of an international Convention. It also considered that the Declaration of Philadelphia affirms

that all human beings, irrespective of race, creed or sex, have the right to pursue both their material well-being and their spiritual development in conditions of freedom and dignity, of economic security and equal opportunity. In addition, discrimination constitutes a violation of rights enunciated by the Universal Declaration of Human Rights. Details of this convention are provided in Articles 1 through 14.

1. For the purpose of this Convention the term ***discrimination*** includes--

a) any distinction, exclusion or preference made on the basis of race, color, sex, religion, political opinion, national extraction or social origin, which has the effect of nullifying or impairing equality of opportunity or treatment in employment or occupation;
b) such other distinction, exclusion or preference which has the effect of nullifying or impairing equality of opportunity or treatment in employment or occupation as may be determined by the Member concerned after consultation with representative employers' and workers' organizations, where such exist, and with other appropriate bodies.

2. Any distinction, exclusion or preference in respect of a particular job based on the inherent requirements thereof shall not be deemed to be discrimination.

3. For the purpose of this Convention the terms ***employment*** and ***occupation*** include access to vocational training, access to employment and to particular occupations, and terms and conditions of employment.

C.3 ENVIRONMENT-RELATED NATIONAL LAWS, RULES, POLICIES, GUIDELINES

Table C.3-1 presents an outline of other National legal instruments that will have relevance to the proposed Project with respect to the social and environment considerations.

Table C.3-1 National Legal Instruments relevant to the Project

Act/ Rule/ Law/ Ordinance	Enforcement Agency – Ministry/ Authority	Key Features	Applicability to proposed Project
National Environmental Policy 2018	Ministry of Environment, Forests and Climate Change	• Has the vision to ensure sustainable development through environmental conservation, pollution control, conservation of biodiversity and by combating the negative impacts of climate change. • Has been set with 16 specific objectives that includes: maintaining natural balance and ensuring overall development of the country through conservation of environment and sustainable management; expansion of climate change adaptation programs to reduce its negative impacts; introduce and encourage wide-spread use of low-carbon emitting technology; identification control of all types of pollution and degradation of environment; ensuring environment friendly development in all sectors	Applicable
National Environmental Policy 1992	Ministry of Environment, Forests and Climate Change	The major objectives of National Environmental Policy are to: ▪ maintain ecological balance and overall development through protection and improvement of the environment; ▪ protect country against natural disaster; ▪ identify and regulate activities, which pollute and degrade the environment; ▪ ensure environmentally sound development in all sectors; ▪ ensure sustainable, long term and environmentally sound base of natural resources; and ▪ actively remain associate with all international environmental initiatives to the maximum possible extent.	Superseded by the 2018 Policy

Act/ Rule/ Law/ Ordinance	Enforcement Agency – Ministry/ Authority	Key Features	Applicability to proposed Project
The Environment Conservation Act, 1995 and subsequent amendments in 2000 and 2002	Department of Environment Ministry of Environment and Forests,	• Define Applicability of environmental clearance • Regulation of development activities from environmental perspective • Framing applicable limits for emissions and effluents • Framing of standards for air, water and noise quality • Formulation of guidelines relating to control and mitigation of environmental pollution, conservation and improvement of environment • Declaration of Ecologically critical areas	Applicable
Environmental Conservation Rules, 2003	Department of Environment Ministry of Environment and Forests	• Declaration of Ecologically critical areas • Requirement of environmental clearance certificate for various categories of projects • Requirement of IEE/EIA as per category • Renewal of the environmental clearance certificate within 30 days after the expiry • Provides standards for quality of air, water and sound and acceptable limits for emissions/discharges from vehicles and other sources	Applicable Projects falls under Red Category and require environmental clearance
Environment Court Act, 2000 and subsequent amendments in 2002	Ministry of Environment, Forests and Climate Change and Judiciary	• GOB has given highest priority to environment pollution • Passed 'Environment Court Act, 2000 for completing environment related legal proceedings effectively	Applicable for completing environmental legal requirements effectively
MOEFCC Circular on ECC in BEZA industrial units (Memo no 22.00.0000.074.18.001.17.44, Date 19.02.2019) and BEZA Standard Operating Procedure for environmental clearance	Ministry of Environment, Forests and Climate Change and BEZA	• Provides guidance on providing Environmental and Site clearance certificates to industrial units specific to economic zones with a view to providing One-stop service. • Requirements for ECC renewals, required documents and application procedures are described in the circular	• Applicable for CuEZL and all its current and future industrial units
BEZA Standard Operating Procedure for Services and Clearance relating to Fire Extinction (2020)	BEZA and Fire Service and Civil Defense (FSCD)	• States procedures for Approval of Fire Fighting Floor Plan (NOC), effectiveness Certificate in favor of Fire safety arrangement and Fire License	• Applicable for CuEZL and all its current and future industrial units

Act/ Rule/ Law/ Ordinance	Enforcement Agency – Ministry/ Authority	Key Features	Applicability to proposed Project
National Policy of Land Use, 2001	Ministry of Land	• Prevent the current tendency of gradual and consistent decrease of cultivable land for the production of food to meet the demand of expanding population; • Ensure that land use is in harmony with natural environment; • Use land resources in the best possible way and to play supplementary role in controlling the consistent increase in the number of land less people towards the elimination of poverty and the increase of employment; • Protect natural forest areas, prevent river erosion and destruction of hills; • Prevent land pollution; and • Ensure the minimal use of land for construction of both government and nongovernment buildings.	Applicable
Road Transport Act 2018, The Motor Vehicles Ordinance, 1983; and The Bengal Motor Vehicle Rules, 1940	Bangladesh Road Transport Authority	• Exhaust emissions • Vehicular air and noise pollution • Road/traffic safety • Vehicle Licensing and Registration • Fitness of Motor Vehicles • Parking by-laws.	Applicable for proposed Project in relation to road transport
Water Supply and Sanitation Act, 1996	Ministry of Local Government, Rural Development and Cooperatives	• Management and Control of water supply and sanitation in urban areas.	Not directly applicable, however, indirectly applicable when considering water usage management and sanitation facilities
The Ground Water Management Ordinance, 1985	Upazila Parishad	• Management of ground water resources • Installation of tube-wells at any place after license from Upazila Parishad only	Proposed Project will use surface water source however, should groundwater also be required then licenses will need to be obtained prior to installation of any tube-wells.
The Forest Act, 1927 and subsequent amendments in 1982 and 1989	Ministry of Environment and Forests	• Categorization of forests as reserve, protected and village forests • Permission is required for use of forest land for any non-forest purposes	Not applicable as proposed Project is not on forest land
The Private Forests Ordinance Act, 1959	Regional Forest Officer, Forest Department`	• Conservation of private forests and for the afforestation on wastelands	Not Applicable
Bangladesh Wild Life (Preservation) Act, 1974	Ministry of Environment and Forest; Bangladesh Wild Life Advisory Board	• Preservation of Wildlife Sanctuaries, Parks, and Reserves	Not applicable as the Project study area does not have any wildlife areas

Act/ Rule/ Law/ Ordinance	Enforcement Agency – Ministry/ Authority	Key Features	Applicability to proposed Project
National Biodiversity Strategy and Action Plan (2004)	Ministry of Environment and Forest Bangladesh Wild Life Advisory Board	• Conserve, and restore the biodiversity of the country for wellbeing of the present and future generations • Maintain and improve environmental stability for ecosystems • Ensure preservation of the unique biological heritage of the nation for the benefit of the present and future generations • Guarantee the safe passage and conservation of globally endangered migratory species, especially birds and mammals in the country • Stop introduction of invasive alien species, genetically modified organisms and living modified organisms	Applicable for conservation of bio-diversity
National Water Bodies Protection Act, 2000	Town development authority/Municipalities	• The characterization of water bodies as rivers, canals, tanks or flood plains identified in the master plans formulated under the laws establishing municipalities in division and district towns shall not be changed without approval of concerned ministry	Applicable due to the proximity to and use of surface water bodies
The Protection and Conservation of Fish Act 1950 subsequent amendments in 1982	Ministry of Fisheries and Livestock	• Protection and conservation of fish in Government owned water bodies	Not directly applicable
The Embankment and Drainage Act 1952	Ministry of Water Resources	• An Act to consolidate the laws relating to embankment and drainage and to make better provision for the construction, maintenance, management, removal and control of embankments and water courses for the better drainage of lands and for their protection from floods, erosion and other damage by water	Not Applicable
Antiquities Act, 1968	Ministry of Cultural Affairs	• This legislation governs preservation of the national cultural heritage, protects and controls ancient monuments, regulates antiquities as well as the maintenance, conservation and restoration of protected sites and monuments, controls planning, exploration and excavation of archaeological sites	Not applicable as the study area does not have any likely cultural heritage or ancient monuments of national or international significance. However in case, any such evidence of archaeological findings arise, the Project will act in consonance to the Act

Act/ Rule/ Law/ Ordinance	Enforcement Agency – Ministry/ Authority	Key Features	Applicability to proposed Project
Administrative and Regulatory Guidelines and Instructions for Land Acquisition	Ministry of Land	• Regulation of land acquisition process by certain administrative instructions and procedural requirements	Not applicable
Framework for Leasing of Government (Khas) Agricultural Land	Ministry of Land	• The rules for allotting and leasing Government-owned (khas) land to land less families	Not applicable
The Building Construction Act 1952 and subsequent amendments	Ministry of Works	• This act provide for prevention of haphazard construction of building and excavation of tanks which are likely to interfere with the planning of certain areas in Bangladesh	Applicable
The Factories Act, 1965 Bangladesh Labour Law, 2006	Ministry of Labour	• This Act pertains to the occupational rights and safety of factory workers and the provision of a comfortable work environment and reasonable working conditions	Applicable
Ozone Depleting Substances (Control) Rules, 2004	Ministry of Environment, Forests and Climate Change	• Ban on the use of Ozone depleting substances • Phasing out of Ozone depleting substances	Applicable
Air Pollution (Control) Rules 2022	Ministry of Environment, Forests and Climate Change	• Prevention of Air pollution • Standards for ambient air levels	Applicable
Noise Pollution (Control) Rules 2006	Ministry of Environment, Forests and Climate Change	• Prevention of Noise pollution • Standards for noise levels	Applicable
Source: Websites of DOE, Legislative and Parliamentary Affairs Division:: Bangladesh Laws and Bangladesh Board of Investment: Business laws			

National Environmental Policy 2018

The concept of environmental protection through national efforts was first recognized and declared in Bangladesh with the adoption of the Environment Policy, 1992 and the Environment Action Plan, 1992. In 2018 the National Environmental Policy has been rewritten with a vision to ensure sustainable development through environmental conservation, pollution control, conservation of biodiversity and by combating the negative impacts of climate change. The Policy has been set with 16 specific objectives include: i) maintaining natural balance and ensuring overall development of the country through conservation of environment and sustainable management, ii) expansion of climate change adaptation programs to reduce its negative impacts; iii) introduce and encourage wide-spread use of low-carbon emitting technology; iv) identification control of all types of pollution and degradation of environment; v) ensuring environment friendly development in all sectors; vi) introduction and extension of cooperation in the national and international sectors for betterment of the global environment; vii) introducing environmental education, increasing ability, public awareness and develop public opinion in conservation of environment; viii) undertaking Public-Private Partnership in the betterment of environment; ix) ensuring sustainable, long-term and environment-friendly use of all natural resources; x) including environmental policy and strategy into the mainstream of other policies and strategies in order to ensure sustainable development; xi) developing population trained in combating any type of environmental and ecological problems including climate change; xii) ensuring that EIA and EA have been performed in all necessary cases; xiii) discouraging artificial introduction of alien and invasive animals and plants, if required, decide through appropriate research; xiv) maintaining active participation with international initiatives as much as possible and taking necessary programs in local and national platforms; xv) taking initiatives in eradicating poverty through conservation of environment; and xvi) strengthening monitoring to ensure that the environmental conservation laws and acts are being followed properly.

It is essential that proper environmental management and appropriate use of different components of environment are practices in every region of the country and in every development projects. Therefore, the National Environmental Policy 2018 has been developed addressing the sector-wise environmental policy among 24 sectors/fields.

National Environmental Policy 1992

The concept of environmental protection through national efforts was first recognized and declared in Bangladesh with the adoption of the Environment Policy, 1992 and the Environment Action Plan, 1992. The major objectives of Environmental policy are to i) maintain ecological balance and overall development through protection and improvement of the environment; ii) protect country against natural disaster; iii) identify and regulate activities, which pollute and degrade the environment; iv) ensure environmentally sound development in all sectors; v) ensure sustainable, long term and environmentally sound base of natural resources; and vi) actively remain associate with all international environmental initiatives to the maximum possible extent.

Bangladesh Environmental Conservation Act (ECA), 1995 amended 2002 & 2010

This umbrella Act includes laws for conservation of the environment, improvement of environmental standards, and control and mitigation of environmental pollution. It is currently the main legislative framework document relating to environmental protection in Bangladesh, which repealed the earlier Environment Pollution Control ordinance of 1977.

The main provisions of the Act can be summarized as:

- Declaration of ecologically critical areas, and restrictions on the operations and processes, which can be carried or cannot be initiated in the ecologically critical area;
- Regulation in respect of vehicles emitting smoke harmful for the environment.
- Environmental Clearance;
- Regulation of industries and other development activities with regards to discharge permits;
- Promulgation of standards for quality of air, water, noises and soils for different areas for different purposes;
- Promulgation of standard limits for discharging and emitting waste; and
- Formulation and declaration of environmental guidelines;

The first sets of rules to implement the provisions of the Act were promulgated in 1997 (see below: "Environmental Conservation Rules 1997"). The Department of Environment (DoE) implements the Act. DoE is headed by a Director General (DG). The DG has complete control over the DoE and the main power of DG, as given in the Act, may be outlined as follows:

- Identification of different types and causes of environmental degradation and pollution;
- Instigating investigation and research regarding environmental conservation, development and pollution.
- Power to close down the activities considered harmful to human life or the environment.
- Power to declare an area affected by pollution as an Ecologically Critical Area. Under the Act, operators of industries/projects must inform the Director General of any pollution incident. In the event of an accidental pollution, the Director General may take control of an operation and the respective operator is bound to help. The operator is responsible for the costs incurred and possible payments for compensation.

The Environmental Conservation Act has been further amended in 2010 where the "Wetland" has been defined to include any marshy land, flood plain land, land of which contain water and rain water; "Hill and Tilla" have been identified as those naturally created earth surface which are above the ground from adjacent plain land, or ground and stone or stone or ground and gravel or mound or place formed any other hard substances and, noted as "Hill and Till" land in government record; and " Hazardous waste" has been defined as any kinds of waste, due to its physical or chemical properties or contraction with other waste or substances create toxicity, infection, oxidation, exploration, radioactivity, decay or other harmful effect to environment. In the 2010 amendment it is prohibited to cutting and/ or razing of hill and tilla by person or institution of government or semi-government or personal or autonomous organization or occupied or personal acquisition: provided that such direction, it will be

possible to cut or raze hill or tilla with respect to clearance certificate from the Department in case of necessity of national interest. Furthermore, to protect the environmental damage, government with respect to provision of other law can control by means of provision production, processing, contain, storage, loading, supply, transportation, import, export, disposal, dumping, etc. of hazardous waste. In this amendment the penalties for various violation have been modified in a tabular form.

Environment Conservation Rules (ECR), 2023

Environmental Conservation Rules (ECR), 2023 has been issued by MoEFCC in March 2023, and repealed the prior ones that was enacted in 1997. ECR, 2023 are the set of rules, promulgated under the Environment Conservation Act 1995. ECR, 2023 has categorized the industries/projects into four --- green, yellow, orange and red, based on their activities, pollution and potential harm to the environment and health. Green categories are Units or projects that have a low impact on the environment and human health. Yellow Category industrial units or projects have a moderate impact on the environment and human health. Orange Categories are institutions or projects that have a significant impact on the environment and human health. Red category has a strong impact on the environment and human health and must reduce environmental impact by protecting environment also by taking pollution control measures. Before instituting new yellow, orange and red industries mentioned in Rule 5 and taking up the project, first the location clearance and then the Environmental Clearance Certificate should be obtained from the Director General (DG) of DoE. Among other things, these rules set the National Environmental Quality Standards for various types of water, industrial effluent, etc., (ii) requirement for and procedures to obtain Environmental Clearance, and (iii) requirements for IEE/EIA according to categories of industrial and other development interventions.

National Policy of Land-use, 2001

The Government of Bangladesh has adopted national Land use Policy, 2001. The salient features of the policy objectives relevant to the proposed are as follows:

- To prevent the current tendency of gradual and consistent decrease of cultivable land for the production of food to meet the demand of expanding population;
- To ensure that land use is in harmony with natural environment;
- To use land resources in the best possible way and to play supplementary role in controlling the consistent increase in the number of land less people towards the elimination of poverty and the increase of employment;
- To protect natural forest areas, prevent river erosion and destruction of hills;
- To prevent land pollution; and
- To ensure the minimal use of land for construction of both government and nongovernment buildings.

Environment Court Act, 2000

The aim and objective of the Act is to materialize the Environmental Conservation Act, 1995 through judicial activities. This Act established Environmental Courts (one or more in every division), set the jurisdiction of the courts, and outlined the procedure of activities and power of the courts, right of entry for judicial inspection and for appeal as well as the constitution of Appeal Court.

Bangladesh Labor Act, 2006

The main purpose of the Bangladesh Labor Act, 2006 is to consolidate and amend the existing laws relating to labor and industrial affairs. Another important objectives of the Bangladesh Labor Act, 2006 are to appoint labor, to increase relation between labors and employers, to specify the lowest wages of the labor, to discharge wages, to compensate for the discharging of the labor, to form the trade unions, to regulate the relations of any differences or disputes arising between labors and employers, to protect the social security of the labor including health, safety and welfare.

Labor law encourages and promotes these purposes by placing statutory limitations on employer interferences with the rights of employees with self-organization and bargaining collectivity and because union, too, may abuse their power, labor law also acts to curb and control union activities.

In an industrial set-up, social justice means an equitable distribution of profits and benefits accruing from industry between industrialists -and workers and affording protection to the workers against harmful effect to their health, safety and morality. Mere compliance with and enforcement of legal rights may be unfair and cause hardship to the enforcement of legal rights by, the workers. Chapters ten, eleven, twelve, sixteen, seventeen of the Bangladesh labor code,2006 and the provisions of the chapter three, four, five, six, seven, eight, and nine of the labor code fixing hours of work, overtime, leave privilege, welfare facilities and safe working conditions are also directed towards the same end.

The Labor Act pertains to the occupational rights and safety of factory workers and the provision of a comfortable work environment and reasonable working conditions. In the chapter six of this law safety precaution regarding explosive or inflammable dust/ gas, protection of eyes, protection against fire, works with cranes and other lifting machinery, lifting of excessive weights are described. In the Chapter eight, provision safety measure like as appliances of first aid, maintenance of safety record book, rooms for children, housing facilities, medical care, group insurance, etc. are illustrated.

Public Procurement Rule (PPR), 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. The rule includes the adequate measure regarding the “Safety, Security and Protection of the Environment’ in the construction works. This

clause includes mainly, the contractor shall take all reasonable steps to (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.

Bangladesh National Building Code, 2020

The basic purpose of this code is to establish minimum standards for design, construction, quality of materials, use and occupancy, location and maintenance of all buildings within Bangladesh in order to safeguard, within achievable limits, life, limb, health, property and public welfare. The installation and use of certain equipment, services and appurtenances related, connected or attached to such buildings are also regulated herein to achieve the same purpose.

Part-7, Chapter-3 of the Code has clarified the issue of safety of workmen during construction and with relation to this, set out the details about the different safety tools of specified standard. In relation with the health hazards of the workers during construction, this chapter describes the nature of the different health hazards that normally occur in the sites during construction and at the same time specifies the specific measures to be taken to prevent such health hazards. According to this chapter, exhaust ventilation, use of protective devices, medical checkups etc. are the measures to be taken by the particular employer to ensure a healthy workplace for the workers.

Chapter-1, part-7 of the Bangladesh National Building Code (BNBC), states the general duties of the employer to the public as well as workers - "All equipment and safeguards required for the construction work such as temporary stair, ladder, ramp, scaffold, hoist, run way, barricade, chute, lift etc. shall be substantially constructed and erected so as not to create any unsafe situation for the workmen using them or the workmen and general public passing under, on or near them".

Chapter -1, Part-7 of the BNBC clearly sets out the constructional responsibilities according to which the relevant authority of a particular construction site shall adopt some precautionary measures to ensure the safety of the workmen. According to section 1.2.1 of chapter 1 of part 7, "in a construction or demolition work, the terms of contract between the owner and the contractor and between a consultant and the owner shall be clearly defined and put in writing. These however will not absolve the owner from any of his responsibilities under the various provisions of this Code and other applicable regulations and bye-laws. The terms of contract between the owner and the contractor will determine the responsibilities and liabilities of either party in the concerned matters, within the provisions of the relevant Acts and Codes (e.g.) the Employers' Liability Act, 1938, the Factories Act 1965, the Fatal Accident Act, 1955 and Workmen's Compensation Act 1923". (After the introduction of the Bangladesh Labor Act, 2006, these Acts have been repealed).

To prevent workers falling from heights, the Code in chapter 3 of part 7 sets out the detailed requirements on the formation and use of scaffolding. According to section 11.2 of the same chapter, "every temporary floor openings shall either have railing of at least 900 mm height or shall be constantly attended. Every floor hole shall be guarded by either a railing with toe board or a hinged cover. Alternatively, the hole may be constantly attended or protected by a removable railing. Every stairway floor opening shall be guarded by railing at least 900 mm high on the exposed sides except at entrance to stairway. Every ladder way floor opening or platform shall be guarded by a guard railing with toe board except at entrance to opening. Every open sided floor or platform 1.2 meters or more above adjacent ground level shall be guarded by a railing on all open sides except where there is entrance to ramp, stairway or fixed ladder. The precautions shall also be taken near the open edges of the floors and the roofs".

Bangladesh Road Transport Act 2018

In the 5th Amendment of the Constitution of Bangladesh in 2011 the Military Ordinances between 24th March 1982 and 11th November 1986 were abolished. Therefore, the Motor Vehicles Act became ineffective and needed an ordinance to ensure state of the art and safe road transport system for Bangladesh. It will complement the Bangladesh Road Transport Authority Act 2017.

C.4 POLICIES, ACT AND REGULATIONS RELATED TO ECONOMIC ZONES

C.4.1 Assessment of Policies

For rapid economic development of Bangladesh through industrialization, Employment generation, upgrading the production level, earning foreign currency by expanding the export it was an unavoidable necessity to establish an Authority to control and manage the setting up and operation of economic zones planned to be developed and maintained on Public-Private Partnership basis, by private sectors and Government initiatives. With that view, Bangladesh Economic Zones Act, 2010 (the Act) was enacted with provision, among others, for establishing an authority naming Bangladesh Economic Zones Authority, popularly known as BEZA. The BEZA was established under Section 17 of the Act. For smooth administration and proper management of the activities in respect of Economic Zones, BEZA framed rules and formulated policy. Also for widening the scope of its activities, the Act and rules have been amended. For attracting the investors, a competitive incentive package has been declared. The BEZA has always been striving to bring improvement in the existing provisions of laws and rules-regulations. It also persevered to formulate new rules and policies for meeting the needs of the day, for protection of rights and interest of the investors and for facilitating proper performing its regulatory functions.

Bangladesh Economic Zones Act, 2010 (amendment 2016)

<u>Establishment of Economic Zone:</u> For the purpose of the Act, the government may, with a view to encouraging rapid economic development in potential areas including backward and underdeveloped regions of the country through increase and diversification of industry,

employment, production and export and to implement the social and economic commitments of the State, establish any of the following categories of economic zones, such as:

i. Economic Zones establishment through public and private partnership by the local and foreign individuals, body or organizations;
ii. Private Economic zones established individual or jointly by local non-resident Bangladesh or foreign investors, body, business organization or groups;
iii. Government Economic Zones established and owned by the Government;
iv. Special Economic Zones established private or by public private partnership or by the Government initiatives for the establishment of any kind of specialized industry or commercial organization;
v. Government 2 Government Economic Zone by any foreign government.

Site Selection and Declaration of Economic Zone: (1) For the purpose of the Act, the Government may, by notification by official Gazette, select any specific land areas as economic zone and declare it as an economic zone. (2) The Schedule of Gazette notification issued for the above shall contain specific description of the land declared as an economic zone. (3) No economic zones should be declared on any land within City Corporation, Municipality or Cantonment Board area.

Acquisition of Land for Economic Zone: Government may acquire any land under the Acquisition and Requisition of immovable Property Ordinance 1982 of required for an economic zone or for infrastructure thereof such as roads bridges etc.

Divisions of Economic Zones in several Areas: The Authority may issue necessary order to prepare a master plan for the land connected with any economic zone dividing it into following areas:

i. *Export Processing Area*: Specified for export processing areas
ii. *Domestic Processing Area*: Specified for industries to be established to meet the demand of the domestic market
iii. *Commercial Area*: Specified for Business organizations, Banks, warehouses, offices and any other organization.
iv. *Non Processing Area*: Specified for residence, health, education amusements, etc.

Appointment of Economic Zone Developers: The authority may appoint economic zone developers in such manner as prescribed.

One Stop Service Act

According to Section 12 of the Bangladesh Economic Zones Act the Authority has a responsibility to make arrangements to facilitate the economic zone developers and industrial units in respect of legal documents which include permission for Economic zone site selection, declaration of economic zones, clearances, certificates, certificate of origin, permits for repatriation of capital and dividends, resident and non-resident visa, work permit, construction permit etc. through One Stop Service Office.

Building Construction Rules

Sensing the necessity of ensuring the quality construction in developing the Economic Zones a set of regulatory rules have been drafted in the name ―Bangladesh Economic Zones (Construction of Building) Rules keeping in view the special requirements for construction of building and other infrastructure. The rules have been enacted in March, 2017 through SRO No. 46-Law/2017. Expectedly these rules will guide the Developers and the Authority in construction of building and infrastructure according to the international standard.

Bangladesh Private Economic Zones Policy 2015

The Policy entitled ―Bangladesh Private Economic Zones Policy, 2015 was published in April, 2015 by S.R.O No. 82-Law/2015. Its English Text was published by S.R.O No.354-Law/ 2015 in November, 2015. In the Policy, emphasis has been given, among others, to the provisions relating to application procedure, principle to be followed in declaring Private Economic Zones and awarding License to the applicant, rights and obligations of the Licensee, Developer, Operator, User and Residents, causes for cancellation of License, providing all necessary Permits, Clearances etc. through one Stop Service Office, Environmental Protection, Safeguards of Rights of the Workers etc. This Policy has been facilitating the prospective applicants willing to establish Private Economic Zones in properly following the process and, on the other hand, indicating the appropriate ways to the concerned officials of the BEZA to perform their regulatory functions in respect of Private Economic Zone under the set policy and procedure.

The Bangladesh Private Economic Zones Policy, 2015 was formulated and then published by notification in the official Gazette by the governing board of the Bangladesh Economic Zones Authority (established under section 17 of The Bangladesh Economic Zones Act, 2010) in exercise of the powers conferred by the Sub-section 1(a) of the Section 22 of the Bangladesh Economic Zones Act, 2010 regarding development, operation, management and control of economic zones.

Chapter two of the policy deals with the establishment of private economic zones, etc. in its Article 3, The content of this article is that according to the provision of sub-section 3 of section 5 of the Bangladesh Economic Zones Act, 2010, private economic zones can be established on any suitable private land of Bangladesh except on any land within the city corporation, municipality or cantonment board area to meet the purpose of the section 4(b)-(d) of the Bangladesh Economic Zones Act,2010. Selecting land for any private Economic Zone, fallen, barren and underdeveloped or backward area will get priority. And a license for establishing a private economic zone will be treated as an administrative grant. This article further added that no organization will undertake or initiate any sort of operations or activities as a developer or operator or a developer and operator in a private economic zone or will not appoint any developer or operator or developer and operator for the development, design, funding, design, constructions, operation, maintenance and expansion in the private economic zone.

Also Articles 18, 19 and 20 of the Bangladesh Private Economic Zones Policy have laid down a narrative guidelines for ensuring all kinds of services for the Private Economic Zones by the One Stop Service Office to be established by the Authority at its Head office and Branch Offices. With a view to provide time-bound accelerated services as required by the Act and Policy by One Stop Service Office, a draft One Stop Service Act has already been prepared and it is in the Process of finalization. Hopefully this Act, will diminish the unreasonable delay in getting necessary permissions and clearances needed for setting up, operation, maintenance and expansion of the Economic Zones.

Bangladesh Economic Zones (Workers Welfare Fund) Policy, 2017

The Bangladesh Economic Zones (Workers Welfare Fund) Policy, 2017 was promulgated in December, 2017 through SRO No, 339-Law/2017. The activities required under this policy includes:

Creation of Fund:

1) The Authority shall create the Bangladesh Economic Zone Workers Welfare Fund for ensuring the welfare of economic zone workers.
2) The Fund shall comprise of the subscription contributed by the enterprise.
3) The rate of subscription shall be as per Schedule: Provided that the Executive Chairman may vary the rate of subscription for an enterprise considering its financial condition.
4) The Authority shall issue subscription bill to every enterprise at the early part of last week of each month.
5) The enterprise shall contribute to the Fund according to the subscription bill.

Use of Fund: The fund shall be used for the following purposes, namely:-

a) pay and allowances of the Arbitrator, Conciliator and Counselor;
b) implementation and management cost of the SDI project;
c) implementation and management cost of the Dormitory Scheme and other facilities in economic zone;
d) administrative cost for security management including setting up of digital security system in economic zone;
e) information, education and communication campaign, social awareness campaigning and training program for economic zone workers; and
f) taking up any other welfare measures for moral uplift, life skill and occupational training, safety and social empowerment of the economic zone workers.

Management of Fund:(1) There shall be a separate bank account for the Fund and the money of the Fund shall be deposited in a Scheduled Bank.

Explanation: For the purpose of this clause Scheduled Bank means a Scheduled Bank as is defined in Article 2 (j) of the Bangladesh Bank Order, 1972(P.O. No. 127 of 1972).

(2) The bank account shall be operated by at least two authorized officers of the Authority.

Books of accounts and record keeping: The Authority shall maintain a set of books of accounts with sufficient records, both manual and digital.

(2) The annual balance sheet and income and expenditure account shall beprepared at the end of every financial year.

Audit of accounts: In addition to regular and continuous audit by the Authority's Internal Audit Department, the Fund shall be audited by a Chartered Accountant as is defined in Article 2 (1) (b) of the Institute of Bangladesh Chartered Accountants Order, 1973 (President's Order No. 2 of 1973) at the end of each financial year.

***BEZA Standard Operating Procedure for Environmental Clearance (MoEFCC Circular on ECC in BEZA Industrial Units; Memo No.* 22.00.0000.074.18.001.17.44, Date 19.02.2019)**

Standard Operating Procedure (SoP) for Bangladesh Economic Zone Authority provides guidance on issuing Environmental Clearance Certificate (ECC) to industrial units specific to economic zone (EZ). On the procedure of ECC for unit investor of the red category project in EZ, investor should submit EIA report along with EMP. In case of EIA study for Red Category Projects, unit investor can use environmental baseline data used in EIA report of the corresponding Economic Zone or Environmental Monitoring data of nearby industries within the same EZ. It is apparent that the Industrial Activities within an Economic Zone cause degradation of Air Quality and depletion of Groundwater due to excessive use by the industries. In accordance with that, the validity period of these baseline data of Economic Zones has been considered to be 5 years. A unit investor of a Red Category Project can conduct temporary works after the issuance of ToR approval. But, it is required to obtain an EIA approval before the construction of main building. Requirements for ECC renewals, required documents and application procedures are described in the circular. Mandates individual ETPs for every industry. The approval process of ECC for Green, Yellow and Orange category industry/project and red category industry/project as described in this SoP for BEZA are presented in Figure C.4-1 and Figure C.4-2 respectively.

Figure C.4-1: Process of application for environmental clearance for Green, Orange and Yellow industries

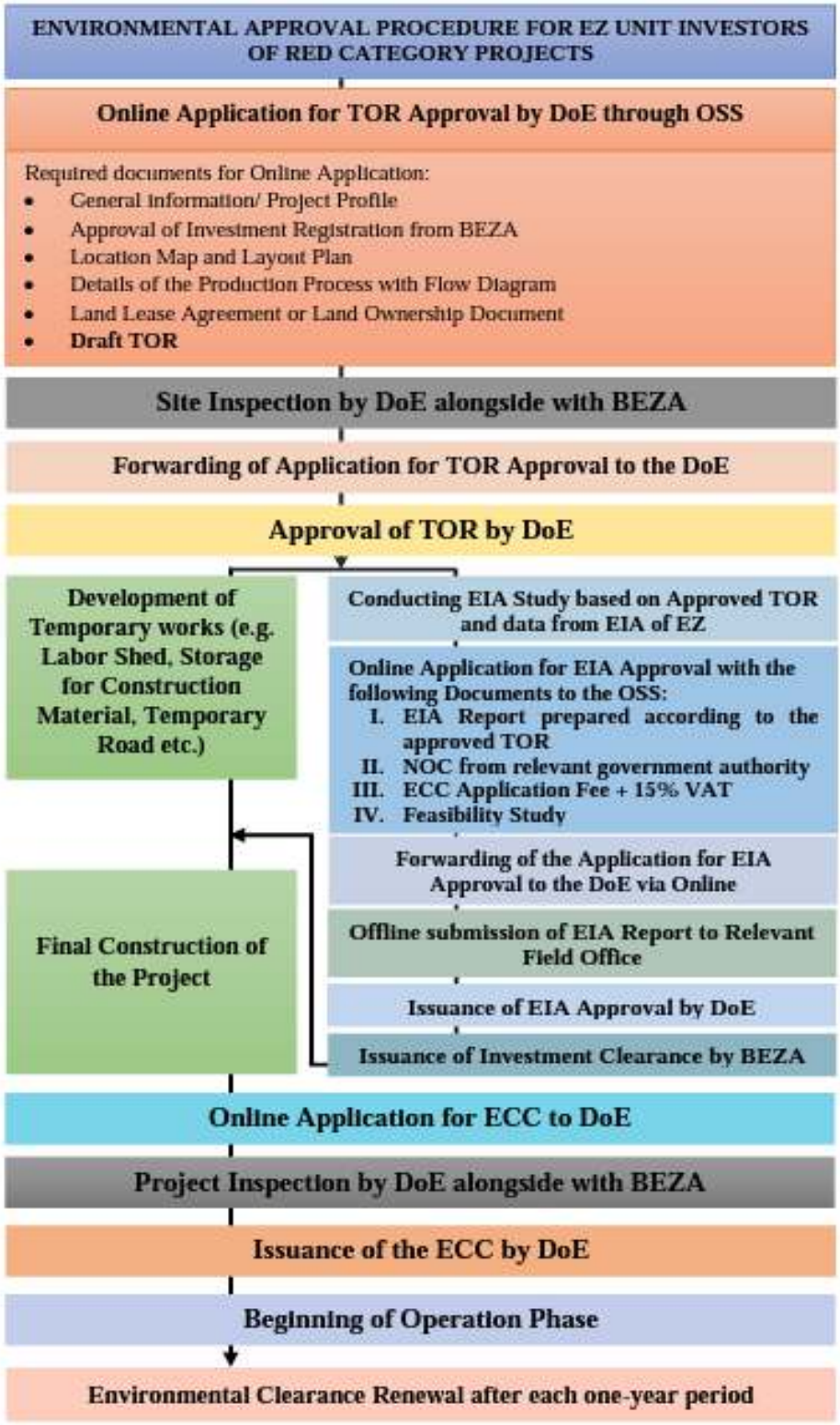


Figure C.4-2: Process of application for environmental clearance for Red category industries

BEZA Standard Operating Procedure for Services and Clearance relating to Fire Extinction, 2020

BEZA Standard Operating Procedure (D) provides the steps and necessary processes of Building Construction SOP (Fire Safety) for industries/units in the economic zones to minimize the fire risks arisen from the process of different flammable and chemical materials as well as huge huge consumption of electric power and pressurized gases. Economic Zone Unit Investor has to take necessary approval from BEZA OSS Centre to protect human safety as well as their investment protection and which will be issued by Fire Service and Civil Defence (FSCD). The first step is the Approval of Fire Fighting Floor Plan (NOC). It indicates that the building fire safety is designed as per the norms and regulations. The Unit Investor should apply for Approval of Fire Fighting Floor Plan (NOC) before starting the building construction. The second step is Effectiveness Certificate in favor of Fire safety arrangement. After completion of fire safety arrangement works as per approved plan, the unit investor should apply BEZA OSS Centre for Effectiveness Certificate in favor of Fire Safety arrangement as per condition of NOC. The third step is the Fire License. Fire License is an obligatory permit for all factory and warehouse. After getting Effectiveness Certificate in favor of Fire safety arrangement, the investor should apply to BEZA OSS Centre for Fire Licenses and it should be renewed every fiscal year.

C.5 NATIONAL SOCIAL POLICIES, LAWS AND REGULATIONS

Infrastructure development projects using lands in Bangladesh is designed and implemented under the legislative and regulatory framework to compensate the affected persons due to land acquisition using the power of eminent domain. Whenever it appears to the Government that any property in any locality is needed or is likely to be needed for any public purpose or in the public interest, the property is acquired using existing laws and regulations. Land acquisition is governed by the Acquisition and Requisition of Immovable Property Ordinance, 1982 (Ordinance II of 1982). The ordinance supersedes earlier laws including the Land Acquisition Law of 1894 and others that have been in force between 1947 and 1982. In addition to the Ordinance, acquisition of any land or forest area in Chittagong Hill-Tracts (CHT) districts requires consent under the Chittagong Hill-Tracts (Land Acquisition) Regulation 1958, the CHT Regional Council Act 1998 and the Forest Act (1927). There is no national policy in Bangladesh governing social effects of infrastructure development projects on the project area communities. However, the Constitution of Bangladesh provides some rights to the affected persons, communities and groups those are not upheld in the Ordinance II of 1982 which is the instrument followed for land acquisition. The active instruments under the legislative and regulatory framework in Bangladesh are discussed below:

Constitution of Bangladesh

The fundamental rights under the Constitution indicate the general guidelines for a policy on resettlement/rehabilitation of citizens adversely affected (whatever be the mechanism) due to any activity of the State. Article 40 of the constitution states categorically that every citizen has the right to practice any lawful occupation which implies that anything impeding such

right (a) should not be done or (b) there should be supplementary measures to make good the losses incurred by the citizen. Resettlement and rehabilitation of adversely affected people due to infrastructure projects very clearly falls within this requirement for supplementary measures. However, as per Article 42, sub-clause 2, no law with provision of compensation for acquisition of land can be challenged in a court on the ground that such compensation has been inadequate. However, under World Bank OP 4.12 Involuntary Resettlement, every affected person will have access to a project specific Grievance Redress Mechanism for dispute resolution before the matter is moved to the courts. Complaints, the resolution process and the outcome will be reviewed by the project proponent as well as the Bank.

The Acquisition and Requisition of Immovable Property Ordinance, 1982

The principal legal instrument governing land acquisition in Bangladesh is the Acquisition and Requisition of Immovable Property Ordinance, 1982 (Ordinance II of 1982 with amendments up to 1994) and other land laws and administrative manuals relevant to land administration in Bangladesh. According to the Ordinance, whenever it appears to the Government of Bangladesh that any property in any locality is needed or is likely to be needed for any public purpose or in the public interest, the Government can acquire the land provided that no property used by the public for the purpose of religious worship, graveyard and cremation ground. The 1982 Ordinance requires that compensation be paid for (i) land and assets permanently acquired (including standing crops, trees, houses); and (ii) any other damages caused by such acquisition. The Deputy Commissioner (DC) determines (a) market value of acquired assets on the date of notice of acquisition (based on the registered value of similar property bought and/or sold in the area over the preceding 12 months), and (b) 50% premium on the assessed value (other than crops) due to compulsory acquisition. The 1994 amendment made provisions for payment of crop compensation to tenant cultivators. The law specifies methods for calculation of market value of property based on recorded prices obtained from relevant Government departments such as Registrar (land), Public Works Department (structures), Department of Forest (trees), Department of Agriculture (crops) and Department of Fisheries (fish stock). Given that people devalue land during title transfer to minimize tax payment, compensation for land paid by DC including premium largely remains less than the actual market price.

The Ministry of Land (MOL) is authorized to deal with land acquisition. The MOL delegates some of its authority to the Commissioner at Divisional level and to the Deputy Commissioner at the District level. The Deputy Commissioners (DCs) are empowered by the MOL to process land acquisition under the Ordinance and pay compensation to the legal owners of the acquired property. Khas (government owned land) lands 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 as the case may be. The DC is empowered to acquire a maximum of 50 standard bigha (6.75 ha) of land without any litigation where the Divisional Commissioner is involved for approval. Acquisition of land more than 50 standard bigha is approved from the central land allocation committee (CLAC) headed by the chief executive of the Government of Bangladesh proposed by the MOL.

The land owner needs to establish ownership by producing record-of-rights in order to be eligible for compensation under the law. The record of rights prepared under 4. 143 or 144 of the State Acquisition and Tenancy Act 1950 (revised 1994) are not always updated and as a result legal land owners have faced difficulties trying to "prove" ownership. The affected person (AP) has also to produce rent receipt or receipt of land development tax, but this does not assist in some situations as a person is exempted from payment of rent if the area of land is less than 25 bighas (3.37 ha).

C.6 INSTITUTIONAL ARRANGEMENTS AT NATIONAL AND SUB-NATIONAL LEVELS

As outlined in the National Environment Policy (1992) and National Forest Policy (1994), the Ministry of Environment and Forests (MoEF) acts as the guide and custodian for the conservation and development of the environment and, in the pursuit of that goal, to ensure through appropriate laws and regulations that natural resources, including land, air, water and forests, are exploited and managed in an environmentally sustainable manner. The Department of Environment (DoE), formed in 1989 with a mandate for environmental management later formalized under the Environment Conservation Act, 1995 (ECA'95), acts as the technical arm of the Ministry and is responsible for environmental planning, management, monitoring and enforcement. The DoE is headed by a Director General, with Divisional offices in Dhaka, Chittagong, Bogra, Khulna, Barisal and Sylhet. The Environment Conservation Rules (2023) provide the Director General a discretionary authority to grant 'Environmental Clearance' to an applicant, exempting the requirement of site/location clearance, provided the DG considers it to be appropriate.

The mandate of the Department has expanded over time, evolving from an exclusive focus on pollution control to include natural resources and environmental management, now covering:

- monitoring environmental quality;
- promoting environmental awareness through public information programs;
- controlling and monitoring industrial pollution;
- reviewing environmental impact assessments and managing the environmental clearance
- process; and,
- establishing regulations and guidelines for activities affecting the environment

C.7 APPLICABLE ENVIRONMENT STANDARDS

C.7.1 Water and Wastewater Quality Standards

ECR, 2023 provides the Water Quality Standards for different types of water such as surface water, drinking water etc. This rules also states the standards for treated sewage and effluent discharged from various industries. The designated best use classification as stated in ECR, 2023 for surface water is as given in Table C.7-1. Table C.7-2, Table C.7-3 and Table C.7-4 highlight standards for inland surface water, drinking water and treated sewage discharge guideline and effluent quality standards respectively.

Table C.7-1: Inland Surface Water Quality Criteria for Designated-Best-Use-Classes (ECR, 2023)

তফসিল-২
পানির মানমাত্রা
[বিধি ৩১ দ্রষ্টব্য]

(ক) ভূ-পৃষ্ঠস্থ পানি

(১) অভ্যন্তরীণ ভূ-পৃষ্ঠস্থ পানির মানমাত্রা

ক্রমিক নং	ব্যবহারের ধরন	স্থিতিমাপ											
		pH	DO মি.গ্রা./লি.	BOD মি.গ্রা./লি.	NO_3-N মি.গ্রা./লি.	NH_3-N মি.গ্রা./লি.	PO_4-P মি.গ্রা./লি.	Total Cr মি.গ্রা./লি.	Pb মি.গ্রা./লি.	H_g মি.গ্রা./লি.	সার্বিক কলিফর্ম জীবাণু সিএফইউ/১০০ মি.লি.	TDS মি.গ্রা./লি.	COD মি.গ্রা./লি.
(১)	(২)	(৩)	(৪)	(৫)	(৬)	(৭)	(৮)	(৯)	(১০)	((১১)	(১২)	(১৩)	(১৪)
১।	কেবল জীবাণুমুক্ত করণের মাধ্যমে সরবরাহের জন্য সুপেয় পানির উৎস	৬.৫-৮.৫	≥৬	≤২	৭.০	০.১	০.১	০.০২	০.০৩	০.০০১	≤১০০	১০০০	১০
২।	বিনোদনমূলক কার্যে ব্যবহার্য পানি	৬.৫-৮.৫	≥৫	≤৩	৭.০	০.৩	০.৫	০.২	০.০৫	০.০০১	≤৫০	১০০০	১০
৩।	প্রচলিত প্রক্রিয়াকরণের মাধ্যমে সরবরাহের জন্য সুপেয় পানির উৎস	৬-৯	≥৫	≤৩	৭.০	০.৩	০.৫	০.০২	০.০৩	০.০০১	≤৫০০০	১০০০	২৫
৪।	মৎস্য চাষে ব্যবহার্য পানি	৬-৯	≥৫	≤৬	৭.০	০.৩	০.৫	০.০৫	০.১	০.০০৪	≤৫০০০	১০০০	৫০
৫।	বিভিন্ন প্রক্রিয়া ও শীতলকরণসহ শিল্পক্ষেত্রে ব্যবহার্য পানি	৬.৫-৮.৫	≥১	১২	-	২.৭	-	০.১	০.১	০.০৫	-	১০০০	১০০
৬।	সেচ কার্যে ব্যবহার্য পানি	৬.৫-৮.৫	-	≤১২	৫.০	১.৫	২.০	০.১	০.১	০.০০২	≤৫০,০০০	১০০০	১০০

নোট: ১। সেচকার্যে ব্যবহার্য পানির তড়িৎ পরিবাহিতা ২২৫০-µS/cm (২৫ ডিগ্রি সেলসিয়াস উষ্ণতা); সোডিয়াম ২৬%-এর নিম্নে, বোরন ০.২%-এর নিম্নে।

Table C.7-2: Standards for Drinking Water (Common parameters) (ECR, 2023)

Parameters	Unit	Standard for Drinking Water (ECR, 2023)
pH	---	6.5 – 8.5
Hardness (as CaCO3)	mg/L	200 - 500
Iron	mg/L	0.3 – 1.0
Chloride	mg/L	150 – 600
Arsenic	mg/L	0.05
Residual Chlorine	mg/L	0.2
Total Coliform	no./ 100 mL	0
Fecal Coliform	no./ 100 mL	0
Ammonia	mg/L	0.5
Nitrate	mg/L	10
Phosphate	mg/L	6

Table C.7-3: Standards for Treated Sewage Discharge (ECR, 2023)

তফসিল-৩
পয়ঃনির্গমন মানমাত্রা
(বিধি ৩২ দ্রষ্টব্য)

ক্রমিক নং	স্থিতিমাপ	একক	উপস্থিতির সর্বোচ্চ সীমা পিএইচ ব্যতীত
(১)	(২)	(৩)	(৪)
১।	উষ্ণতা (Temp)	ডিগ্রি সেন্টিগ্রেড	৩০
২।	পিএইচ (pH)	-	৬-৯
৩।	বিওডি$_{৫}$ ২০° সেন্টিগ্রেড (BOD_5 at 20°C)	মি.গ্রা./লি.	৩০
৪।	সিওডি (COD)	মি.গ্রা./লি.	১২৫
৫।	প্রলম্বিত কঠিন বস্তু (SS)	মি.গ্রা./লি.	১০০
৬।	তৈল ও গ্রিজ (Oil & Grease)	মি.গ্রা./লি.	১০
৭।	নাইট্রেট (NO_3)	মি.গ্রা./লি.	৫০
৮।	ফসফেট (PO_4)	মি.গ্রা./লি.	১৫
৯।	সার্বিক কলিফর্ম (Total Coliform)	সিএফইউ/১০০ মি. লি.	১০০০

শর্তাবলি :

(১) এই মানমাত্রা ভূপৃষ্ঠস্থ পানি প্রবাহে নির্গমনের ক্ষেত্রে প্রযোজ্য।

(২) চূড়ান্ত নির্গমনের পূর্বে পয়ঃনির্গমনকে ক্লোরিন দ্বারা পরিশোধিত করিতে হইবে। Residual Chlorine (ক্লোরিন) ০.২ মি.গ্রা./লি. বেশি হওয়া যাইবে না।

C.7.4 Effluent (from industries/projects) Quality Standards (ECR, 2023)

তফসিল-৪
শিল্প প্রতিষ্ঠান বা প্রকল্পের তরল বর্জ্য নির্গমন মানমাত্রা
(বিধি ৩২ দ্রষ্টব্য)

ক্রমিক নং	স্থিতিমাপ	একক	নির্গমন স্থানে উপস্থিতির সর্বোচ্চ সীমা পিএইচ ব্যতীত		
			অভ্যন্তরীণ ভূপৃষ্ঠস্থ পানি	গণপয়ঃপদ্ধতি দ্বিতীয় পর্যায়ে প্রক্রিয়াকরণ	সমুদ্র উপকূলীয় এলাকা
(১)	(২)	(৩)	(৪)	(৫)	(৬)
১।	অ্যামোনিয়াকেল নাইট্রোজেন (মৌল N হিসাবে)	মি.গ্রা./লি.	৫০	৫০	৫০
২।	অ্যামোনিয়া (মুক্ত NH_3 হিসাবে)	মি.গ্রা./লি.	৫	৫	৫
৩।	আর্সেনিক (As হিসাবে)	মি.গ্রা./লি.	০.২	০.২	০.২
৪।	বিওডি$_5$ ২০°সেন্টিগ্রেড (BOD_5 at 20° C)	মি.গ্রা./লি.	৩০	২৫০	১০০
৫।	বোরন (B)	মি.গ্রা./লি.	২	২	৪.০
৬।	ক্যাডমিয়াম (Cd হিসাবে)	মি.গ্রা./লি.	২	১	২
৭।	ক্লোরাইড (Cl^-)	মি.গ্রা./লি.	৬০০	৬০০	-
৮।	সার্বিক ক্রোমিয়াম (Total Cr)	মি.গ্রা./লি.	০.৫	১.০	১
৯।	সিওডি (COD)	মি.গ্রা./লি.	২০০	৪০০	২৫০
১০।	হেক্সাভ্যালেন্ট ক্রোমিয়াম (Hexavalent Cr)	মি.গ্রা./লি.	০.১	২.০	১
১১।	তাম্র (Cu হিসাবে)	মি.গ্রা./লি.	৩.০	৩.০	৩
১২।	ফ্লোরাইড (F হিসাবে)	মি.গ্রা./লি.	২	১৫	১৫
১৩।	সালফাইড (S হিসাবে)	মি.গ্রা./লি.	১	-	৫
১৪।	আয়রন (Fe হিসাবে)	মি.গ্রা./লি.	৩	৩	৩
১৫।	সার্বিক জেলডাল নাইট্রোজেন (Total Kjeldahl Nitrogen)	মি.গ্রা./লি.	১০০	-	১০০
১৬।	লেড (Pb হিসাবে)	মি.গ্রা./লি.	০.১	১.০	২.০
১৭।	ম্যাংগানিজ (Mn হিসাবে)	মি.গ্রা./লি.	২	২.০	২
১৮।	মার্কারি (Hg হিসাবে)	মি.গ্রা./লি.	০.০১	০.০১	০.০১
১৯।	নিকেল (Ni হিসাবে)	মি.গ্রা./লি.	১.০	২.০	৫
২০।	নাইট্রেট (মৌল N হিসাবে)	মি.গ্রা./লি.	১০	-	২০

ক্রমিক নং	স্থিতিমাপ	একক	নির্গমন স্থানে উপস্থিতির সর্বোচ্চ সীমা পিএইচ ব্যতীত		
			অভ্যন্তরীণ ভূপৃষ্ঠস্থ পানি	গণপয়ঃপদ্ধতি দ্বিতীয় পর্যায়ে প্রক্রিয়াকরণ	সমুদ্র উপকূলীয় এলাকা
(১)	(২)	(৩)	(৪)	(৫)	(৬)
২১।	তৈল এবং গ্রিজ (Oil & grease)	মি.গ্রা./লি.	১০	২০	২০
২২।	ফেনল যৌগাদি (C_6H_5OH হিসাবে)	মি.গ্রা./লি.	১.০	৫	৫
২৩।	দ্রবীভূত ফসফরাস (P হিসাবে)	মি.গ্রা./লি.	৫.০	-	-
২৪।	তেজস্ক্রিয় দ্রব্য (ক) আলফা কণা বিচ্ছুরণ (খ) বিটা কণা বিচ্ছুরণ	মাইক্রো কুরি/লি.	বাংলাদেশ পরমাণু শক্তি কমিশন কর্তৃক স্থিরীকৃত	-	-
২৫।	পিএইচ (pH)		৬-৯	৬-৯	৬-৯
২৬।	সিলেনিয়াম (Se হিসাবে)	মি.গ্রা./লি.	০.০৫	০.০৫	০.০৫
২৭।	জিংক (Zn হিসাবে)	মি.গ্রা./লি.	৫	১৫	১৫
২৮।	তাপমাত্রা	ডিগ্রি সেন্টিগ্রেড	জলাধারের তাপমাত্রার চাইতে ৫° সেলসিয়াসের বেশি হইবে না।	-	জলাধারর তাপমাত্রার চাইতে ৫° সেলসিয়াসের বেশি হইবে না।
২৯।	প্রলম্বিত কঠিন বস্তুকণা (SS)	মি.গ্রা./লি.	১০০	৫০০	১০০
৩০।	সায়ানাইড (CN হিসাবে)	মি.গ্রা./লি.	০.১	২.০	০.২
৩১।	টোটাল রেসিডিওয়াল ক্লোরিন (Total Residual Chlorine)	মি.গ্রা./লি.	১.০	-	১.২
৩২।	Bio assay test (কেবল বালাইনাশক ও ঔষধ কারখানার ক্ষেত্রে প্রযোজ্য)		৯০% মাছ ৯৬ ঘণ্টা পরেও পরিশোধিত তরলবর্জ্যে জীবিত থাকে।	৯০% মাছ ৯৬ ঘণ্টা পরেও পরিশোধিত তরলবর্জ্যে জীবিত থাকে।	৯০% মাছ ৯৬ ঘণ্টা পরেও পরিশোধিত তরলবর্জ্যে জীবিত থাকে।

C.7.2 Ambient Noise Standards

Table C.7-5 and Table C.7-6 show the Bangladesh noise level standards and the World Health Organization noise level guidelines for community noise (Environmental, Health, and Safety General Guidelines, 2007), respectively, during daytime and nighttime for various types of areas. Table C.7-7 and Table C.7-8 present the noise limits for various working environments according to Environmental, Health, and Safety General Guidelines and OSHA, respectively.

Table C.7-5: Bangladesh standards for sound level (GoB, 2006)

Locations	Noise level (dBA)at day	Noise level (dBA)at night
Silent zone	50	40
Residential area	55	45
Mixed area	60	50
Commercial	70	60
Industrial area	75	70

(Ref: Noise Pollution Control Rules, 2006)

Table C.7-6: Noise Level Guidelines (Guidelines for Community Noise, WHO, 1999)

Receptor	One Hour L_{Aeq} (dBA)	
	Daytime 07:00 – 22:00	Nighttime 22:00 – 7:00
Residential, institutional, educational	55	45
Industrial, commercial	70	70

Note: For acceptable indoor noise levels for residential, institutional, and education settings refer to WHO (1999)

Table C.7-7: Noise Limits for Various Working Environments.

Location/ activity	Equivalent Noise L_{Aeq}, 8h	Maximum L_{Amax}, fast
Heavy Industry (no demand for oral communication)	85 dB(A)	110 dB(A)
Light Industry (decreasing demand for oral communication)	50 – 65 dB(A)	110 dB(A)
Open offices, control rooms, service counters or similar	45 – 50 dB(A)	--
Individual offices (no disturbing noises)	40 – 45 dB(A)	--
Classrooms, lecture halls	35 – 40 dB(A)	--
Hospitals	30 – 35 dB(A)	40 dB(A)

Note: For acceptable indoor noise levels for residential, institutional, and education settings refer to WHO (1999)

Table C.7-8: OSHA Noise Exposure Limits for the Work Environment (in dBA)

Noise Levels	Permissible Exposure
85	16 hrs
87	12 hrs 6 min.
90	8 hrs
93	5 hrs 18 min

Noise Levels	Permissible Exposure
96	3 hrs 30 min
99	2 hrs 13 min
102	1 hr 30 min
105	1 hr
108	40 min
111	26 min
114	17 min
115	15 min
118	10 min
121	6.6 min
124	4 min
127	3 min
130	1 min

Note: Exposure above or below the 90 dBA limit have been time weighted to give what OSHA believes are equivalent risks to a 90 dBA 8 hr. exposure (Marsh, 1991, p.322).

C.7.3 Air Quality Standards

Air Pollution Control Rules (2022) have issued standards for Ambient Air Quality, Odor Standards, Emission standards from different industries etc. These standards are presented in Table C.7-9, Table C.7-10, and Table C.7-11 respectively.

Table C.7-9: Ambient Air Quality standards (Air Pollution Control Rules, 2022)

তফসিল ১

পরিবেষ্টক বায়ুর মানমাত্রা (Ambient Air Quality Standards)

[বিধি ৩ এর উপ-বিধি (১) এবং বিধি ৫ এর উপ-বিধি (১) দ্রষ্টব্য]

বায়ুদূষক	মানমাত্রা	গড় সময়
কার্বন মনোঅক্সাইড (CO)	০৫ মিলিগ্রাম/ঘনমিটার[ক]	৮ ঘণ্টা
	২০ মিলিগ্রাম/ঘনমিটার[ক]	১ ঘণ্টা
লেড (Pb)	০.২৫ মাইক্রোগ্রাম/ঘনমিটার[খ]	বার্ষিক
	০.৫০ মাইক্রোগ্রাম/ঘনমিটার[ক]	২৪ ঘণ্টা
নাইট্রোজেন ডাইঅক্সাইড (NO_2)	৪০ মাইক্রোগ্রাম/ঘনমিটার[খ]	বার্ষিক
	৮০ মাইক্রোগ্রাম/ঘনমিটার[ক]	২৪ ঘণ্টা
বস্তুকণা$_{১০}$(PM_{10})	৫০ মাইক্রোগ্রাম/ঘনমিটার[খ]	বার্ষিক
	১৫০ মাইক্রোগ্রাম/ঘনমিটার[ক]	২৪ ঘণ্টা
বস্তুকণা$_{২.৫}$($PM_{2.5}$)	৩৫ মাইক্রোগ্রাম/ঘনমিটার[খ]	বার্ষিক
	৬৫ মাইক্রোগ্রাম/ঘনমিটার[ক]	২৪ ঘণ্টা
ওজোন (O_3)	১৮০ মাইক্রোগ্রাম/ঘনমিটার[ক]	১ ঘণ্টা
	১০০ মাইক্রোগ্রাম/ঘনমিটার[ক]	৮ ঘণ্টা
সালফার ডাইঅক্সাইড (SO_2)	২৫০ মাইক্রোগ্রাম/ঘনমিটার[ক]	১ ঘণ্টা
	৮০ মাইক্রোগ্রাম/ঘনমিটার[ক]	২৪ ঘণ্টা
অ্যামোনিয়া (NH_3)	১০০ মাইক্রোগ্রাম/ঘনমিটার[খ]	বার্ষিক
	৪০০ মাইক্রোগ্রাম/ঘনমিটার[ক]	২৪ ঘণ্টা

নোট: * এই তফসিলে বায়ু মানমাত্রা বলিতে পরিবেষ্টক বায়ুর মানমাত্রা (Ambient Air Quality Standards)-কে বুঝাইবে।

(ক) গড়মান বৎসরে একবারের অধিক অতিক্রম করিবে না।

(খ) লক্ষ্যমাত্রা অর্জিত হইবে যখন বার্ষিক গড়মান নির্ধারিত মানমাত্রার মধ্যে থাকিবে ।

Table C.7-10: Odor Standards (Air Pollution Control Rules, 2022)

তফসিল ৪
ঘ্রাণ মানমাত্রা
[বিধি ৩ এর উপ-বিধি (১) দ্রষ্টব্য]

ক্রমিক নং	স্থিতিমাপ	একক	মানমাত্রা
১।	অ্যাসিটালডিহাইড	পিপিএম	০.৫-৫.০
২।	অ্যামোনিয়া	পিপিএম	১-৫
৩।	হাইড্রোজেন সালফাইড	পিপিএম	০.০২-০.২০
৪।	মিথাইল ডাই সালফাইড	পিপিএম	০.০০৯-০.১০
৫।	মিথাইল মারক্যাপটান	পিপিএম	০.০২-০.২০
৬।	মিথাইল সালফাইড	পিপিএম	০.০১-০.২০
৭।	স্টাইরিন	পিপিএম	০.৪-২.০
৮।	ট্রাইমিথাইলএমিন	পিপিএম	০.০০৫-০.০৭

শর্তাবলি:

(১) কোনো নির্গমন/নিঃসরণ নল ৫ মিটারের অধিক উচ্চতাসম্পন্ন হইলে তাহাদের ক্ষেত্রে সাধারণভাবে যে নিয়ন্ত্রণ মান প্রয়োগ করা হইবে তাহা নিম্নরূপ, যথা:—

Q=০.১০৮ xH_e^2Cm (যেখানে Q=গ্যাস নিঃসরণের হার Nm^3/ঘণ্টা)

H_e=নিঃসরণ নলের উচ্চতা

C_m=উপরিউক্ত বর্ণিত মানমাত্রা (পিপিএম)

* এই তফসিলের ঘ্রাণ মানমাত্রা মহাপরিচালক কর্তৃক অনুমোদিত পরিমাপ পদ্ধতিতে নমুনা সংগ্রহ ও বিশ্লেষণ করা যাইবে।

Table C.7-11: Emission Standards from Industries (Air Pollution Control Rules, 2022)

তফসিল ৫

শিল্পপ্রতিষ্ঠান বা প্রকল্পের গ্যাসীয় নিঃসরণ মানমাত্রা

[বিধি ৩ এর উপ-বিধি (২) এবং বিধি ৮ এর উপ-বিধি (১) ও (২) দ্রষ্টব্য]

(১) তাপ বিদ্যুৎ কেন্দ্র

স্ট্যাক নিঃসরণ (**Stack Emission**):

স্থিতিমাপ	একক	উপস্থিতির সর্বোচ্চ সীমা
কয়লাভিত্তিক বিদ্যুৎ কেন্দ্র		
১। বস্তুকণা (PM)		
(ক) নূতন (২০২০ খ্রিষ্টাব্দের পর চালু)	mg/Nm^3	(ক) ৫০
(খ) বিদ্যমান (২০২০ খ্রিষ্টাব্দের পূর্বে চালু)		(খ) ১০০
২। সালফার ডাইঅক্সাইড (SO_2)	mg/Nm^3	
(ক) নূতন (২০২০ খ্রিষ্টাব্দের পর চালু)		(ক) ২০০
(খ) বিদ্যমান (২০২০ খ্রিষ্টাব্দের পূর্বে চালু)		(খ) ৪০০
৩। নাইট্রোজেনের অক্সাইডসমূহ (NO_X)	mg/Nm^3	
(ক) নূতন (২০২০ খ্রিষ্টাব্দের পর চালু)		(ক) ২০০
(খ) বিদ্যমান (২০২০ খ্রিষ্টাব্দের পূর্বে চালু)		(খ) ৪০০
তৈলভিত্তিক বিদ্যুৎকেন্দ্র		
১। বস্তুকণা (PM)	mg/Nm^3	
(ক) নূতন (২০২০ খ্রিষ্টাব্দের পর চালু)		(ক) ৫০
(খ) বিদ্যমান (২০২০ খ্রিষ্টাব্দের পূর্বে চালু)		(খ) ৮০
২। সালফার ডাইঅক্সাইড (SO_2)	mg/Nm^3	
(ক) নূতন (২০২০ খ্রিষ্টাব্দের পর চালু)		(ক) ২০০
(খ) বিদ্যমান (২০২০ খ্রিষ্টাব্দের পূর্বে চালু)		(খ) ৪০০
৩। নাইট্রোজেনের অক্সাইডসমূহ (NO_X)	mg/Nm^3	
(ক) নূতন (২০২০ খ্রিষ্টাব্দের পর চালু)		(ক) ২০০
(খ) বিদ্যমান (২০২০ খ্রিষ্টাব্দের পূর্বে চালু)		(খ) ৪০০

স্থিতিমাপ	একক	উপস্থিতির সর্বোচ্চ সীমা
প্রাকৃতিক গ্যাসভিত্তিক বিদ্যুৎকেন্দ্র ১। নাইট্রোজেনের অক্সাইডসমূহ (NO_X) (ক) নূতন (২০২০ খ্রিষ্টাব্দের পর চালু) (খ) বিদ্যমান (২০২০ খ্রিষ্টাব্দের পূর্বে চালু)	mg/Nm^3	(ক) ২০০ (খ) ৪০০
অন্যান্য গ্যাসীয় (Gaseous) জ্বালানিভিত্তিক (LPG, LNG ইত্যাদি) বিদ্যুৎকেন্দ্র ১। বস্তুকণা (PM) ২। সালফার ডাইঅক্সাইড (SO_2) ৩। নাইট্রোজেনের অক্সাইডসমূহ (NO_X)	mg/Nm^3	(ক) ৫০ (খ) ৪০০ (গ) ২০০

(৭) শিল্প প্রতিষ্ঠানের বয়লার

গ্যাসীয় নিঃসরণ

ক্রমিক নং	স্থিতিমাপ	একক	উপস্থিতির সর্বোচ্চ সীমা
১।	কালি ও বস্তুকণা (PM) (জ্বালানিভিত্তিক) (ক) কয়লা (খ) গ্যাস (গ) তৈল (ঘ) তুষ/চারকল	mg/Nm^3	 ২৫০ - ২০০ ২৫০
২।	নাইট্রোজেনের অক্সাইডসমূহ (NO_X) (জ্বালানিভিত্তিক) (ক) কয়লা (খ) গ্যাস (গ) তৈল (ঘ) তুষ/চারকল/অন্যান্য প্যালেট	mg/Nm^3	 ৪০০ ১৫০ ৩০০ ৪০০
৩।	মার্কারি এবং মার্কারি যৌগসমূহ (Hg-Mercury & Mercury compounds) (কেবল কয়লা জ্বালানি ব্যবহারকারী বয়লারের ক্ষেত্রে প্রযোজ্য)	mg/Nm^3	০.০৩
৪।	সালফার ডাই অক্সাইড (SO_2)	mg/Nm^3	২৫০

ANNEX D
CLIMATE AND DISASTER RISK SCREENING

D.1 INTRODUCTION

Building resilience to climate and geophysical hazards is a vital step in the fight against poverty and for sustainable development. Screening for risks from these hazards improves the likelihood and longevity of a project's success. The project level Climate and Disaster Risks Screening Tool provides early stage due diligence on climate and disaster risks at the concept stage of project development. The tool uses an exposure - sensitivity - adaptive capacity framework to consider and characterize risks from climate and geophysical hazards, based on key components of a project and its broader development context.

This report summarizes the results of the screening process for the development of Cumilla Economic Zone Limited (CuEZL) Project under IPFF II. The potential risks flagged in this report were identified through the four screening stages by connecting information on climate and geophysical hazards exposure with the user's subject matter expertise and understanding of the project components and sensitivity to rate the impacts. The tool does not provide detailed risk assessments, rather it flags risks to inform consultations, enhance dialogue with local and other experts, and define further analytical work at the project location. This early stage due diligence can be used to strengthen the consideration of climate and disaster considerations in key components of the project design, including the physical (e.g., dams and reservoirs, wastewater treatment plants, etc.) and non-physical aspects (e.g., capacity building of water managers, water resource planning and institutional strengthening at community level, hygiene promotion and education campaigns, etc.). The broader sectoral (e.g., appropriate water policies, emergency protocols are in place that enable the water authority to respond to natural disasters, etc.) and development context conditions (e.g., strong legal enforcement of water pricing policies, climate related early warning systems, etc.) could help modulate the risks to the delivery of the outcome/service level.

The results of the screening are presented below, with supporting narrative to guide their interpretation.

D.2 CLIMATE AND DISASTER RISK SCREENING RESULTS SUMMARY

D.2.1 Project Information Summary

Table D.1 below provides key project information including the location and key project development objectives.

Table D.1: Project Information

Project Information	
Title	Cumilla Economic Zone Limited (CuEZL)
Number	IPFF2 (Financial Intermediary) OP4.03 (Private sector Development)
Region	South Asia
Country	Bangladesh
Type of Assessment	Industry Projects
Purpose of Screening	Climate change risk screening
Current Project Phase	Under construction
Funding Source	World Bank
Keywords	Economic Zone, Industry
Brief Description of Project	The main objective of the CuEZL project is to develop an economic zone of international standards for promoting investment and industrial development in Bangladesh.
Location	Comilla Economic zone Limited (CuEZL) is located in Sonachar Mauza, Luterchar Union, Meghna Upazila, Comilla District, Chittagong Division, along Dhaka-Chittagong Highway. The Economic zone will cover the total area of 240.3615 acres of land. These land areas were treated as Null land by local AC Land Office. The bank of the river Meghna and its branches are considered as industrial belt, as there are many industries located in and around the Upazila. The proposed site at Luterchar Union is on the bank of a branch of Meghna River. It is just 600 Meters from the Dhaka-Chittagong Four lane Highway and four and half Kilometer from the Meghna Bridge 1. It is 33 KM from Dhaka and The Hazrat Shahjalal International airport is 44 KM away. The Kamalapur railway station is about 33 Km from the zone.
Sub Sectors	Industry
Outcome/ Service Delivery	This area will be developed by the Proponent itself and with the aim of targeting the comparatively non-polluting industries. The targeted Industries are as follows. 1. RMG & Textile 2. Food Processing 3. Vehicles & Parts Manufacturing 4. Pharmaceuticals 5. Leather Goods & Footwear 6. Machineries/Electronic Equipment/Light Engineering 7. Glass 8. Steel related products

	9. Beverage & Mineral Water 10. Packaging Film Industries 11. Tiles & Ceramic 12. IT & Computer Related Equipment 13. Electronics Equipment & Assembling 14. Mobile, Telephone and Assembling 15. Plastic Articles

D.2.2 Summary of Exposure to Climate and Geophysical Hazards

Table D.2 presents a summary description of exposure to climate and geophysical hazards at the project location for the Historical/Current and Future time frames[1]. Exposure to climate hazards is evaluated in two time frames, because past records are not necessarily indicative of future conditions.

The descriptions provide a summary of the key characteristics and some indication of the trends in exposure from each hazard, drawing on global, quality-controlled data sets from the Climate Change Knowledge Portal (CCKP). It is useful, for example to understand the temperature range and the rate of annual or decadal increase in a region; or precipitation patterns for historical and future time frames and seasonality shifts. Understanding the trends of hazards is important as they act individually and collectively on components/sub-sectors of the project. Because geophysical hazards (such as earthquakes, tsunamis, landslides, and volcano eruptions) do not have associated future projections, exposure for those hazards is assessed only in the Historical/Current time frame.

Table D.2: Summary of Exposure to Climate and Geophysical Hazards at Project Location

Hazard	Time Frame	Description of hazards for your location
Extreme Temperature	Current	Average monsoon-season maximum and minimum temperatures show an increasing trend annually at the rate of 0.05°C and 0.03°C, respectively An increasing trend of about 1°C in May and 0.5°C in November during the 14 year period from 1985 to 1998 has been observed in Bangladesh.
	Future	Projected to increase with greatest warming (Dec-Feb) 1.4°C by 2050 2.4°C by 2100
	Current	The erratic nature of rainfall and temperature has increased in Bangladesh.

[1] The Future time frame is based on changes projected to occur between the 1980-1999 average and a future average. This future average is most likely the 2040-2059 average (i.e., the default in the Climate Change Knowledge Portal - CCKP). Users can choose to select another time frame, or choose to use national/local data sets, but if so, this should be reflected in the notes section of the tool (and summarized in Annex 2). The CCKP draws on global, quality-controlled datasets and is continually updated as new data become available. In some cases, the CCKP is supplemented with other sources of information. For more detail on the data used in this step, please refer to the Data Annex. Climate Change Knowledge Portal (http://climateknowledgeportal.worldbank.org).

Hazard	Time Frame	Description of hazards for your location
Extreme Precipitation and Flooding		The project area is subject to River/Monsoon flooding. A branch of Meghna River flows along the boundary of the project area.
	Future	As yet it is difficult to project rainfall changes for the Ganges River flood plain, with some models projecting wetter and others projecting drier conditions. However, Runoff, Time between rainy days and Peak 5-day rainfall intensity are expected to increase.
Drought	Current	The area is not yet vulnerable to climatic drought, but climatic drought does occur.
	Future	Agricultural drought is expected to increase due to the increase of the erratic nature of rainfall.
Sea Level Rise	Current	The rise is 6 to 9mm annually in the central coastal region, which covers Noakhali, Laxmipur and their adjacent districts while 11 to 20mm rise has been observed in the coastal areas of Chittagong and Cox's Bazaar. In another study by IWM, revaeled that the annual rate of increase of average water level at Khulna, Hironpoint and Khepupara is about 6mm, 8mm and 7mm respectively. The location of the project is not in the coastal area. So there is no risk of the effects of sea level rise.
	Future	Sea level rise is projected for Bangladesh, although there is disagreement on what the degree of sea level will be- one study suggests an increase of 30-100 cm by 2100, while the IPCC Third Assessment gives a global average range with a slightly lower values of 9 to 88 cm. While the area is not likely to be directly affected by sea level rise, there could be indirect effects from migrant populations from coastal areas.
Storm Surge	Current	During the period 1960 to 2009, nineteen cyclones hit the coast of Bangladesh. Simulation result from these cyclonic events shows the eastern coast gets a chance of being inundated by 2-3 m. The location of the project is not in the coastal area. So there is no risk of the effects of storm surge.
	Future	Storm surge height is expected to increase, but estimates are highly uncertain. The frequency of tropical cyclones in the Bay of Bengal may increase and, according to the Intergovernmental Panel on Climate Change's Third Assessment Report, there is "evidence that the peak intensity may increase by 5% to 10% and precipitation rates may increase by 20% to 30%" (IPCC 2001). Cyclone induced storm surges are likely to be exacerbated by a potential rise in sea level of over 27 cm by 2050. An increase of 10 to 20% in tropical cyclone intensities for a rise in sea-surface temperature of 2 to 4°C relative to the current threshold temperature is likewise projected in East Asia, South-East Asia and South Asia (Knutsonand Tuleya, 2004, IPCC 2007).

Hazard	Time Frame	Description of hazards for your location
Strong Winds	Current	Significant increasing trends in the cyclone frequency over the Bay of Bengal during November and May, which are main months for cyclone activity in the Bay of Bengal, have been observed.
	Future	The maximum wind speed from tropical cyclones is expected to increase, but estimates are highly uncertain. With higher sea surface temperature, 10% increase in maximum wind speed of cyclone is expected by 2100.
Earthquake	Current	Project site falls under zone 2 which is a moderate earthquake zone. The Zone-II includes the greater districts of Dinajpur, Bogra, Dhaka and Chittagong and the shocks of intensity of VIII are possible.
Tsunami	Current	Since the project location is not located in the sea-coast, there is no risk of tsunami.
Landslide	Current	There is no risk of landslide in the area.

Insufficient Understanding	Not Exposed No Potential Impact No Risk	Slightly Exposed Low Potential Impact Low Risk	Moderately Exposed Moderate Potential Impact Medium Risk	Highly Exposed High Potential Impact High Risk

D.2.3 Summary of Overall Project Risk

Table D.3 highlights the impact ratings on the project's component/subsectors, and the overall risk to the outcome/service level for both Historical/Current and Future time frames. The ratings are derived on the basis of the hazard information, subject matter expertise, contextual understanding of the project, and modulated on the basis of adaptive capacity and the larger development context of the water sector and country. The results indicate what components are most at risk. The actual ratings themselves, while instructive, should inform further consultations, dialogue, and future planning processes.

D.2.3.1 Results Summary - by Component / Subsector

Table D.3 provides a characterization of risks due to climate and geophysical hazard on project subsectors/components for both Historical/Current and Future time frames. The results indicate where risks may exist within one or multiple components and where further work may be required to reduce or manage these climate and geophysical risks. An ongoing process of monitoring risks, refining climate and other information, and regular impact assessment may also be appropriate. The potential impact on the key components/subsectors due to exposure from hazards is modulated by the project's non-physical components (enabling and capacity building activities). The right kind of capacity building measures could increase preparedness and longer-term resilience and reduced the risks. An understanding of larger sector and

development context with respect to key modulating factors helps to assess the climate risks in terms of adaptive capacity. In the case of CuEZL, the overall summary of risk is as follows:

- Physical components: **Impact from 'Low' to 'Medium' in future**
- the Non-physical Components: **Slightly Reduces Impact**
- the Broader Development Context: **Slightly Increases Impact**
- Physical components: **Impact from 'Low' to 'Medium' in future**
- Outcome/service delivery: **Impact from 'Low' to 'Medium' in future**

Table D.3: Results Summary - by Component / Subsector

Sub-sector	**Physical Components**		**Non-Physical Components**		**Development Context**		**Outcome / Service Delivery**	
Time Frame	**Current**	**Future**	**Current**	**Future**	**Current**	**Future**	**Current**	**Future**
Industry			Long- term strategic planning Significantly Reduces Impact Maintenance and operations Slightly Reduces Impact Data gathering, monitoring, and information management systems Slightly Reduces Impact Overall Slightly Reduces Impact		Population growth Significantly Increases Impact Legal enforcement Slightly Reduces Impact Gender inequity Slightly increases Impact Overall Slightly Increases Impact			

Impact on Project's Physical Infrastructure

This step provides an indication of the potential impacts of climate and geophysical hazards on the project's physical infrastructure and assets as currently designed under relevant subsectors.

Climate and geophysical hazards are likely to significantly impact the structural integrity, materials, siting, longevity and overall effectiveness of your investments. In the context of the project, the intensity of precipitation is projected to increase, which could cause greater flooding from the Meghna River branch. This will also increase the cost of office, and manufacturing facility construction. In addition, increased flooding may raise the risk of environmental contamination from industrial activities. Since extreme precipitation may considerably affect operations and logistics, the level of potential impact is rated High. Projections indicate that temperature are likely to increase significantly, and the dry season may become longer. Both of these changes would affect wastewater quality concerns. Extreme temperatures may also cause depreciation in equipment requiring larger maintenance and operation investments. Therefore, in future the impact is **from 'low' to 'medium'**.

Non-physical components and broader development context

This step provides information on how the potential impact on key components/subsectors due to exposure from hazards is modulated by the project's soft components (enabling and capacity building activities) and broader development context (including sector context and other social, economic and political factors). This step also takes into account particularly vulnerable groups including women, migrants and displaced populations.

For investments with long operational lifetimes, such as physical infrastructure, considering future climate variability and change is critical to avoid "locking in" designs and features that are only suited to current climate. The project will extract large quantities of groundwater for bottled water production. Climate change variability may affect extraction and consequently the groundwater availability in surrounding areas. The project includes installation of monitoring devices in groundwater wells to monitor the GW level which will allow early warning and prediction of adverse impacts, if any. The project also includes capacity enhancement, emergency preparedness plan, awareness raising and evacuation drills involving local communities living in the vicinity of the industry project. The project will also include support to strengthen budgeting processes to account for additional maintenance costs to address increasing damages from hazards, and increase flexibility in management protocols to allow for adaptation to changing hazards. Strategic planning that considers how climate and geophysical hazards may affect key assets, system reliability, and demand may help improve long-term climate resilience. The ground level after landfilling within CuEZL has been elevated to 1 meter above the historical highest flood level of Meghna River Branch. This provides some resilience against flooding from Meghna River Branch. Legal enforcement of proper building codes and zoning regulations may reduce the vulnerability of industrial infrastructure to extreme weather events. All physical infrastructures will be designed according to the Bangladesh National Building Code which considers wind and earthquake load in structural designs. This provides security against disasters such as earthquake and strong winds. CuEZL management will allocate budget for operations, maintenance and repairs of equipment and structural elements which might deteriorate as a result of extreme climate events (Temperature, precipitation etc.). Combined, these features may reduce the anticipated risk from climate and geophysical hazards. On the other hand, huge population growth,

probable migration of population from climate-affected areas will increase population density overall and may have adverse impact. Existing gender inequity in the area may pose risks in responding to climate change effects. However, strong ESMS and monitoring mechanism within the CuEZL operation may help to reduce some of these impacts.

Risks to Outcome/Service delivery of the project

This step provides an indication of the level of risk to the outcome/service delivery that the project is aiming to provide. The risk to the outcome/service delivery of your project is Medium. This rating is derived from hazard information, subject matter expertise, contextual understanding of the project, and modulated on the basis of the project's soft components and broader development context. The potential risks to construction, logistics, and operations due to flooding is greatly reduced by the project design and soft components, which takes flood risk into account. However, lack of emergency response systems to bring back connectivity and critical supplies for operations in case of extreme weather events moderately increases such risk. Therefore, the overall risk to the outcome of the project is considered to be **Medium**.

D.2.3.3 Detailed Results by Subsector

Table D.4 presents the detailed results of subsectors screened in the industrial project, including the project's investments in physical structures. The table represents the potential impact of climate and geophysical hazards on these investments. The impact ratings are based on the exposure ratings and the understanding of the project's sensitivity by the user. Understanding the contribution of risks from the subsectors (and relevant aspects within each subsector), both individually and collectively can help inform the process of dialogue, consultation, and analysis during project design.

Table D.4: Detailed Results Summary – by subsector

Subsector	Component	Potential Impact			
		Component Risk		Overall Risk	
		Current	Future	Current	Future
Industry	Physical infrastructure				
	Effluent Quality				
	Waste generation				
	Water Extraction				

The potential impact of these hazards are rated on four different aspects of the industrial installations:

- Physical infrastructure
- Effluent Quality
- Waste generation
- Water extraction

The potential impact of climate and geophysical hazards on the project's investments is rated based on exposure ratings for the location, and an understanding of the project's historical and future sensitivity to these risks. In this case, the tool is helping judge the effect these impacts may have on the investment, and the ability of the project to sustain and enhance water supply under a changing climate. Projected increases in temperature and the related increases in evapotranspiration may pose risks to industrial installation related investments as discussed in the previous section. However, improved management in terms of operation and maintenance, combined with better disaster and emergency management system, is one approach to building resilience to these anticipated risks. The current risks are described as 'low' while the future risk is projected as 'medium'. The ratings are based on expert judgment and an understanding of the local development context.

D.2.4 Key Drivers of Risks

Based on the results above, Table D.5 highlights the key drivers of risk for each project component/subsector ratings, in terms of hazards that are likely to pose the greatest challenge. The ratings for the potential impact for each component/subsector reflect the aggregate rating across multiple hazards, drawing on all of the exposure information and their own expert judgment. For example, high temperatures and drought can increase the demand for water (affecting water extraction), while greater rainfall may reduce demand from GW sources but also increase risk of flooding for downstream communities. Similarly, strong winds affect infrastructure integrity, floods affect infrastructure safety, effluent dissipation and high temperature affects equipment longevity. Specific consideration should be given to those hazards which have high ratings, or are moving from medium to high ratings over time. For example, sea-level rise may not be a key risk driver in the Historical/Current time frame; but may emerge as a key driver across multiple sectors in the future time frame (due to migration of people from climate-affected areas). Understanding which hazards are key drivers may help flag follow-on work to manage climate risks within the design and delivery of the project.

Table D.5: Key Drivers of Risk

Project Sub-sector	Historical/Current Drivers	Future Drivers
Physical components	Earthquake	Extreme Temperature Extreme Precipitation and Flooding Strong Winds Earthquake Drought
Non-Physical Components	*	Non-compliance with regulations
Broader development outcomes	*	Population Growth

		Gender inequity Sea level rise
Outcome / Service Delivery	*	Lack of disaster preparedness Sea level rise

Key: Low risk | Medium Risk

*If a cell is blank it implies there is 'No high or medium risks' identified for this aspect of the project.

D.3 NEXT STEPS

By understanding which of the project components is most at risk from climate change and other natural hazards on the basis of the screening, measures to avoid their impacts can be taken by:

- Enhancing the consideration of climate and disaster risks early in the design stage of the project.
- Using your risk screening analysis to inform follow-up feasibility studies and technical assessments.
- Encourage local stakeholder consultations and dialogues to enhance resilience measures and overall success of the project.

Table D.6A provides some general guidance based on the risk ratings for the Outcome/Service Delivery, and Table 6B lists some climate risk management measures.

Table D.6A: General Guidance Based on Risk Ratings for Outcome/Service Delivery

Insufficient Understanding	Gather more information to improve your understanding of climate and geophysical hazards and their relationship to your project.
No Risk	If you are confident that climate and geophysical hazards pose no risk to the project, continue with project development. However, keep in mind that this is a high-level risk screening at an early stage of project development. Therefore, you are encouraged to monitor the level of climate and geophysical risks to the project as it is developed and implemented.
Low Risk	If you are confident that climate and geophysical hazards pose low risk to the project, continue with project development. However, keep in mind that this is a high-level risk screening at an early stage of project development. Therefore, you are encouraged to monitor the level of climate and geophysical risks to the project as it is developed and implemented. You may also consider gathering additional information to increase your level of confidence in your rating.
Medium Risk	For areas of Medium Risk, you are encouraged to build on this screening through additional studies, consultation, and dialogue. This initial screening may be supplemented with a more detailed risk assessment to better understand the nature of the risk to the project.

High Risk	For areas of High Risk, you are strongly encouraged to conduct a more detailed risk assessment and to explore measures to manage or reduce those risks.

Table D.6B: Types of Climate Risk Management Measures for typical Industry Projects

Objective	Examples
Accommodate/ Manage	• Change the frequency of repair schedules and implement changes in maintenance protocols. • Develop contingency plans in the event of disruption and install redundant systems to back up a primary system. • Plan back-up power systems for critical facilities. • Setting up rapid emergency response teams to repair damaged facilities quickly. • Provide education and training for staff to effectively respond to system disruptions or emergency events. These actions often can be readily redesigned, based on an evaluation of progress, changing needs, and new information. • Establish or expand a contingency budget reserve or insurance plan to address unexpected disruptions and fund investments to restore services and facilities.
Protect/ Harden	• Upgrade design standards and codes (e.g., using stronger building materials) and their implementation for both new construction and renovation. • Design facilities to be waterproofed where increased flooding is expected. • Build dikes to contain flooding. • Add reinforcements to walls and roofs. • Increase drainage of facilities. • Fortify existing structures by incorporating extra foundational supports. • Erect protective barriers, levees or sea walls, or natural areas (i.e., green infrastructure such as wetlands or replenished barrier islands) to buffer infrastructure from climate impacts. • Elevate roads, bridges and structures, and change the curvature of drains and roads. • Use more resilient building materials. • Employ more robust specifications allowing structures to withstand more extreme conditions (such as higher wind or water velocity).
Site Selection/ relocate	• Relocate critical public buildings and machinery to higher or less vulnerable locations. • Site emergency response infrastructure (fire stations, helipad) in secure locations. • Locate critical infrastructure systems in more protected areas. • Integrate sea level rise projections and storm surge in coastal siting. • Relocate or refit extremely vulnerable existing infrastructure.
Build information collection and management systems	• Strengthen climate information systems, building on existing regional and national networks. • Build relevant local and/or regional research programs on the links between climate and services (e.g. vulnerability index). • Build capacity of national governments to harmonize data across regions.

Objective	Examples
Strengthen policies, planning and systems	• Integrate climate information into operational planning. • Update zoning and local codes to minimize operations in high risk areas. • Strengthen disaster planning and response for infrastructure. • Improve training, education and outreach efforts and programs related to climate impacts and adaptation.

ANNEX – E

Environmental and Social Audit forms for New Industries

ENVIRONMENTAL AND SOCIAL SCREENING DATASHEET FOR NEW INDUSTRIES

CUMILLA ECONOMIC ZONE LIMITED (CuEZL)

(to be completed by CuEZL during allotment of plot to an industry)

Name of the Industrial Unit:	
Address (Plot no.):	
Type of Industry: **(as per Schedule A of ECR 2023)**	
Category of Industry: **(as per ECR 2023)**	□ **Green** □ **Yellow** □ **Orange** □ **Red**

SECTION I – BASIC INFORMATION OF THE INDUSTRIAL UNIT

1	Expected Date of starting construction (if the entity carries out construction):
2	Expected date of ending construction (if the entity carries out construction):
3	Expected date of trial production/ starting of operation:
4	Name of product and quantity to be produced (daily/monthly/yearly):
5	Name of raw materials and quantity required (daily/monthly/yearly):
6	Source of the raw material(s) and name of the primary supplier(s):
7	Source of water and quantity of water used (daily):

8	Source, name and quantity of fuel used (daily/monthly/yearly):	
9	Probably quantity of liquid wastewater (if any) and location of discharge:	
10	Probable quantity of gaseous emissions (if any) and mode of emission	
11	No objection certificate from local authority:	
12	Will the industry have its own ETP (if liquid wastewater discharge occurs)?	Yes/No
13	Process flow diagram of the industrial process:	
14	IEE/EIA/EMP report (whichever applicable)	

Information on Section I can be obtained by ECC application form submitted to DoE by the project proponent

SECTION II – ENVIRONMENTAL AND SOCIAL SCREENING

1	Did the industry develop their own Environmental and Social Management System (ESMS)? (Attach the ESMS documentation or refer to the specific section in the EIA report)	Yes / No
2	Does the industry have their own environmental and social policies defined? (Attach the E&S policy)	Yes / No
3	Has the industry identified all relevant environmental and social risks either as a part of EIA/EMP or through E&S Screening? (Attach E&S Screening forms if IEE/EIA/EMP is not prepared)	Yes / No

4	Will the industry engage third party (e.g. construction contractors) in any of their work? If yes, have they incorporated construction-phase environmental mitigation measures and occupational health safety requirements in their contract agreements?	Yes / No
5	Do you foresee individuals and groups being affected directly and differentially or disproportionately by the project because of their disadvantaged or vulnerable status?	Yes / No
6	Has the industry appointed a focal person for Environmental and Social Compliance?	Yes / No
7	Has the industry developed an emergency preparedness plan? (attach the plan if it is not a part of the EIA/IEE/EMP)	Yes / No
8	Has the industry agreed to share information regarding performance of ESMS periodically through a legal agreement?	Yes / No
9	Has the industry conducted consultations with the local community as a part of E&S screening, IEE/EIA/EMP preparation? (attach the summary of consultations if it is not a part of the EIA/IEE/EMP)	Yes / No
10	Has the industry disclosed their EIA/IEE/EMP in any public domain (e.g website)?	Yes / No
11	Does the industry have its own 'external' grievance redress mechanism? External GRM includes methods to (i) receive and register external communications from the public; (ii) screen and assess the issues raised and determine how to address them; (iii) provide, track, and document responses, if any; and (iv) adjust the management program, as appropriate.	Yes / No
12	Are the provisions of Bangladesh Labor Law 2013 (amended 2016) regarding workers rights and working conditions included in the contract between the industry and CuEZL?	Yes / No
13	Does the industry discourage the formation of worker associations for collective bargaining?	Yes / No
14	Will the industry provide accommodation to its workers within its premises or outside its premises?	Yes / No
15	Has the industry made arrangements of adequate sanitation facilities for workers?	Yes / No

16	Mention the approximate number of workers to be engaged in the industrial facility.	
17	Will female workers be employed?	Yes / No
18	Has the industry made separate arrangements of sanitation facilities for female workers?	Yes / No
19	Has the industry established a GRM to prevent and address, harassment, initimidation, and/or exploitation for women?	Yes / No
20	Does the contract with CuEZL include provisions for non-discrimination, forced labour and child labour as per Bangladesh labor law 2013 (amended 2016)?	Yes / No
21	Does the industry have an occupational health and safety plan taking into consideration its respective risks? (attach the OHS plan if it is not a part of the EIA/IEE/EMP)	Yes / No
22	Are mitigation measures for pollution (air, noise, water etc) prevention adequately stated in the EMP?	Yes / No
23	Will the industry use large quantities of water in its production process? If yes, have water use efficiency measures incorporated in the EMP?	Yes / No Yes / No / NA
24	Will the industry install their own tubewell? If yes, has permission to install the tubewell obtained? (attach permit)	Yes / No Yes / No / NA
25	Has the industry allocated a budget for environmental monitoring as per the EMP?	Yes / No
26	Does the industry use hazardous raw materials or generate hazardous materials as waste? If yes, has a hazardous material management plan developed? (attach the Hazmat management plan if it is not a part of the EIA/IEE/EMP)	Yes / No Yes / No / NA

ANNEX – F

Environmental and Social Audit for Construction Activities

1. **Cumilla Economic Zone Site**
2. **Cumilla Economic Zone Administrative Building**
3. **Meghna Re-Rolling and Steel Mills Ltd.**
4. **Meghna Glass Industries Ltd**.

Annex F- Environmental and Social Audit for Industries under Construction

1. Cumilla Economic Zone Site

Basic Information

SN	Item	Description
1	Factory Name	Cumilla Economic Zone Site
2	Factory address	Meghna Cumilla
3	Office address	HS-15, Road, Gulshan-1, Dhaka.
4	Contact Person:	Mohammed Moniruzzaman/Hamidul Haque/Md. Mazharul Islam
5	Telephone	
6	Cell	01324415800 / 01727601092 / 01713205034
7	E-mail	mohammed.moniruzzaman@mgi.orgm / md-mazharul.islam@mgi.org
8.	Website	www.mgi.org
9.	Category as per GoB ECR, 2023	– Red
10	Category As per WB 4.03/IPFF-II ESPP Safeguard Policy Guideline	Category B (Medium Risk)
11.	ECC from DOE	Yes, Validity: Date: 08.06.2024

Site audit (22/12/2022)

Sl.	Site Audit	Issues	Yes/No	Comments
1	Site Inspection (Walk-Around)	a. Is the site well organized and maintained in good condition?	Yes	Partly yes
		b. Are quantities of chlorinated solvents (e.g. 1,1,1-trichloroethane) used on site and recorded?	NA	
		c. Are quantities of cylinders with toxic/flammable residuals held on site kept to a minimum?	NA	
2	Resource use	a. Does your entity use energy such as electricity, oil, or gas? If yes, what is the usage rate per month?	Yes	Electricity & oil (52610KWH & 32752L)/month
		b. Does your entity use energy from any renewable energy source?	No	

		c. **Does your entity use any chemicals in the manufacturing process?**	**Yes**	**Admixture(Construction chemical)**

Sl.	Site Audit	Issues	Yes/No	Comments
		d. **Does your entity use water in the manufacturing process? If yes, what is the usage rate per month?**	**Yes**	**Ground water 4000 m^3/month**
		e. **Does your entity have any water conservation practice guideline?**	**No**	
		f. **Does your entity practice rainwater harvesting program?**	**No**	
		g. **Does your entity have any modification to the process to reduce wastewater generation?**	**No**	**Not relevant**
		h. **Does your entity have any tree plantation program?**	**Yes**	**Documents are attached (Layout of master plan)**
3	***Air Emissions***	a. **Are suspected, detected or declared to the administration pollution defined or analyzed with request for remediation?**	**Yes**	**Spraying water for dust control**
		b. **Are the conditions, processes, contamination acceptance level estimated or defined?**	**No**	**Ambient air quality parameters are not measure yet**
		c. **Are site processes and operations free of significant fugitive air emissions?**	**No**	**Excavated soil and construction materials are not managed properly**
4	***Water Discharges***	a. **Does the entity discharge any liquid waste?**	**No**	
		b. **If the site's discharge of liquid effluent to ground, surface water (including streams, rivers and lakes) meet DOE standard?**	**NA**	
5	***Solid & Hazardous Waste***	a. **Does your entity have an inventory of both hazardous and Non-hazardous waste?**	**No**	
		b. **Does the site have details of where wastes are finally disposed of (including by-waste)?**	**No**	
		c. **Does the plant produce any hazardous waste?**	**No**	
		d. **Is the solid waste disposal carried out following the regulations?**	**Yes**	**Documents are attached (Not given)**

Sl.	Site Audit	Issues	Yes/No	Comments
		e. **Are approved waste haulers/disposal authorities or companies being used?**	**Yes**	**Documents are not provided**
6	***Storage***	a. **Are containers storing hazardous materials in good condition?**	**No**	**Photos are available**
		b. **Are containers storing hazardous materials labelled properly?**	**No**	**Photos are available**
		c. **Are liquid hazardous materials stored on impervious surface?**	**No**	**Admixture/ Diesel**
		d. **Are liquid hazardous materials stored with secondary containment (capable of volume of the largest stored container prevailing regulations and guidance)?**	**Yes**	**Admixture/ Diesel**
		e. **Are storage areas well maintained?**	**No**	
		f. **Are storage areas clearly identified?**	**No**	**Partly yes; Storage of all construction materials are not clearly identified**
		g. **Are storage areas protected from weather as necessary?**	**No**	
		h. **Does your entity keep regular inventory of stock entry and stock out items?**	**Yes**	**Documents are not provided**
7	***Emergency planning and community relations***	a. **Are the site emergency procedures regularly reviewed and exercised?**	**Yes**	**Photo/documents are not found**
		b. **Is the chain of incident commander responsibility clearly defined?**	**No**	
		Hazardous substances a. **Is there a program to eliminate, or if not possible reduce the use of hazardous substances?**	**No**	
		b. **Is there a list of the hazardous substances on site, plus information on handling, disposal, MSDS etc.**	**No**	

Sl.	Site Audit	Issues	Yes/No	Comments
		c. **Does your entity, routinely or in specific circumstances, track chemical use through materials accounting or some other method as distinct from, or in addition to, tracking environmental releases?**	**No**	
8	***Occupational Health and Safety***	a. **Does your entity have guidelines/ documents for occupational health and safety practices?**	**Yes**	**Documents are attached (Annex N)**
		b. **Is there a program to eliminate, or if not possible reduce the hazardous work environment?**	**No**	
		c. **Are there any guidelines on preventive and protective measures against hazardous conditions for the workers?**	**No**	
		d. **Are there any documentations and reporting of occupational incidents, accidents, and diseases?**	**Yes**	**Documents are attached (Accident/incident register)**
		e. **Are there any occupational incidents, accidents, and diseases?**	**No**	**Documents are attached (Accident/incident register)**
		f. **Is there any compensation program for occupational incidents including accidents and diseases?**	**No/Yes**	**No documents found**
9	***Other potential issues***	**Will the site activity include/ involve any of the following potential issues and/or impacts?**		
		1. Building rehabilitation **Not applicable**		
		•Site specific vehicular traffic		
		•Increase in dust and noise from demolition and/or construction		
		•Construction waste		
		2. New construction		
		•Excavation impacts and soil erosion		**No**

		•Increase sediment loads in receiving waters		No

Sl.	Site Audit	Issues	Yes/No	Comments
		•Site specific vehicular traffic		Yes
		•Increase in dust and noise from demolition and/or construction		Yes
		•Construction waste		Yes
		3. Acquisition of land Not applicable		
		•Encroachment on private property		
		•Relocation of project affected persons		
		•Involuntary resettlement		
		•Impacts on livelihood incomes		
		4. Hazardous or toxic materials		
		•Removal and disposal of toxic and/or hazardous demolition and/ or construction waste	NA	
		•Storage of machine oils and lubricants	Yes	
		5. Impacts on forests and/or protected areas Not applicable		
		•Encroachment on designated forests, buffer and /or protected areas		
		•Disturbance of locally protected animal habitat		

PART II: PICTORIAL EVIDENCE OF HEALTH AND SAFETY COMPLIANCE OF CONSTRUCTION OF SITE OFFICE AND OTHERS

Picture 1: Picture shows recycling the construction waste

Picture 2: Diesel and construction chemicals empty containers are spread in the concern area

Picture 3: Workers are using Helmet and Gumboot during working.

Picture 4: Workers are using Helmet but not Gumboot during working

Picture 5: High voltage electricity points are cordoned by the precautionary notice (tape)

Picture 6: High voltage electricity points are open at a working area

Picture 7: The emergency assembly point is occupied with materials and car parking

Picture 8: Construction materials (Steel, stone chips, brick, brick chips and sand) are not covered

Picture 9: Construction chemicals (admixture) are not properly stored

Picture 10: Construction area signage and precautionary notice (tape) placed during work

Picture 11: Station for storing diesel and delivering it to cars in a secondary container. However, no appropriate markings have been discovered.

Picture 12: Various electric drilling machine and welding equipment are scattered on the construction site

Picture 13: Safety instructions sign and complain box at the construction site

Picture 14: No safety barricade or sign at the construction site (only rope)

PART-III: Action Plan for Compliance

Environmental Social Action Plan (ESAP) for Compliance

Sl	Issues	Current Status	Comments
1.	Documentation	Occupational incidents, accidents records are not found.	All documentations of accidents, injuries and deaths must be recorded.
2.	Hazardous material storage	Hazardous material storage areas are not properly labelled, storage areas are not properly identified, and not protected from weather	Storage area should be clearly identified using labels. Sheds should be erected over the hazardous material (fuel) storage areas
3	Construction site housekeeping	There is poor housekeeping. Construction debris are scattered in several locations often blocking smooth vehicle movement. Construction materials are not covered, which may result in fugitive emission.	Housekeeping practice need to be improved (better site debris management, covering of loose construction materials etc)
4	Occupational health and safety	Non-compliance Noted	OHS compliance must be enforced.

2. Cumilla Economic Zone Administrative Building

Basic Information

SN	Item	Description
1	**Factory Name**	Administrative Building (12 Floors)
2	**Factory address**	Cumilla Economic Zone (CuEZ), Meghna, Cumilla
3	**Office address**	HS-15, Road, Gulshan-1, Dhaka.
4	**Contact Person:**	Mohammed Moniruzzaman/Hamidul Haque/Syedul Haque Sakib
5	**Telephone**	
6	**Cell**	01324415800 / 01727601092 /01313497701
7	**E-mail**	mohammed.moniruzzaman@mgi.org m / md-mazharul.islam@mgi.org
8.	**Website**	www.mgi.org
9.	**Category as per GoB ECR, 2023**	Red
10.	**Category As per WB 4.03/IPFF-II ESPP Safeguard Policy Guideline**	Category B (Medium Risk)
11.	**Fire License**	Application is under processing
11.	**ECC from DOE**	Application is under processing

Site Audit **Date: 12.10.2023**

Sl.	Site Audit	Issues	Yes/No	Comments
1	Site Inspection (Walk-Around)	**a.** Is the site well organized and maintained in good condition?	**Yes**	**Partly yes**
		b. Are quantities of chlorinated solvents (e.g. 1,1,1-trichloroethane) used on site and recorded?	**No**	
		c. Are quantities of cylinders with toxic/flammable residuals held on site kept to a minimum?	**No**	
2	Resource use	**a.** Does your entity use energy such as electricity, oil, or gas? If yes, what is the usage rate per month?	**Yes**	Individual data are not available (Total

Sl.	Site Audit	Issues	Yes/No	Comments
				Consumptions are shown in the main report)
		b. Does your entity use energy from any renewable energy source?	**No**	
		c. Does your entity use any chemicals in the manufacturing process?	**Yes**	Admixture (Construction chemical)
		d. Does your entity use water in the manufacturing process? If yes, what is the usage rate per month?	**Yes**	Individual data are not available
		e. Does your entity have any water conservation practice guideline?	**No**	
		f. Does your entity practice rainwater harvesting program?	**No**	
		g. Does your entity have any modification to the process to reduce wastewater generation?	**NA**	
		h. Does your entity have any tree plantation program?	**Yes**	**Documents are attached (Layout of master plan)**
3	*Air Emissions*	**a.** Are suspected, detected or declared to the administration pollution defined or analyzed with request for remediation?	**Yes**	**Spraying water for dust control**
		b. Are the conditions, processes, contamination acceptance level estimated or defined?	**No**	
		c. Are site processes and operations free of significant fugitive air emissions?	**Yes**	
4	*Water Discharges*	**a.** Does the entity discharge any liquid waste?	**No**	
		b. If the site's discharge of liquid effluent to ground, surface water (including streams, rivers and lakes) meet DOE standard?	**NA**	
5	*Solid & Hazardous Waste*	**a.** Does your entity have an inventory of both hazardous and Non-hazardous waste?	**No**	

Sl.	Site Audit	Issues	Yes/No	Comments
		b. Does the site have details of where wastes are finally disposed of (including by-waste)?	**No**	
		c. Does the plant produce any hazardous waste?	**No**	
		d. Is the solid waste disposal carried out following the regulations?	**Yes**	**No documents**
		e. Are approved waste haulers/disposal authorities or companies being used?	**Yes**	**Documents are not provided**
6	*Storage*	**a.** Are containers storing hazardous materials in good condition?	**NA**	
		b. Are containers storing hazardous materials labelled properly?	**NA**	
		c. Are liquid hazardous materials stored on impervious surface?	**NA**	
		d. Are liquid hazardous materials stored with secondary containment (capable of volume of the largest stored container prevailing regulations and guidance)?	**NA**	
		e. Are storage areas well maintained?	**NA**	
		f. Are storage areas clearly identified?	**NA**	
		g. Are storage areas protected from weather as necessary?	**NA**	
		h. Does your entity keep regular inventory of stock entry and stock out items?	**Yes**	**Documents are not provided**
7	*Emergency planning and community relations*	**a.** Are the site emergency procedures regularly reviewed and exercised?	**Yes**	Photos are available
		b. Is the chain of incident commander responsibility clearly defined?	**No**	
		<u>*Hazardous substances*</u> a. Is there a program to eliminate, or if not possible reduce the use of hazardous substances?	**No**	

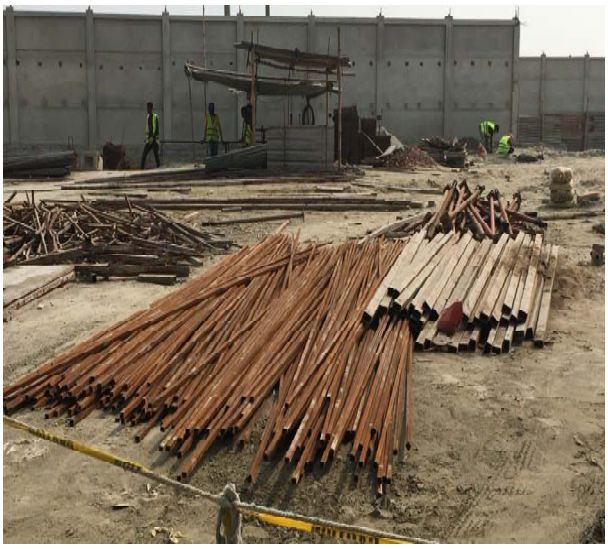
Sl.	Site Audit	Issues	Yes/No	Comments
		b. Is there a list of the hazardous substances on site, plus information on handling, disposal, MSDS etc.	**No**	
		c. Does your entity, routinely or in specific circumstances, track chemical use through materials accounting or some other method as distinct from, or in addition to, tracking environmental releases?	**No**	
8	*Occupational Health and Safety*	a. Does your entity have guidelines/ documents for occupational health and safety practices?	**Yes**	**Documents are attached**
		b. Is there a program to eliminate, or if not possible reduce the hazardous work environment?	**No**	
		c. Are there any guidelines on preventive and protective measures against hazardous conditions for the workers?	**No**	
		d. Are there any documentations and reporting of occupational incidents, accidents, and diseases?	**Yes**	**Documents are attached (Accident/incident register)**
		e. Are there any occupational incidents, accidents, and diseases?	**No**	**Documents are attached (Accident/incident register)**
		f. Is there any compensation program for occupational incidents including accidents and diseases?	**Yes**	**Documents are not available**
9	*Other potential issues*	Will the site activity include/ involve any of the following potential issues and/or impacts?		
		1. Building rehabilitation **Not applicable**		
		•Site specific vehicular traffic		
		•Increase in dust and noise from demolition and/or construction		
		•Construction waste		
		2. New construction		
		•Excavation impacts and soil erosion	**No**	

Sl.	Site Audit	Issues	Yes/No	Comments
		•Increase sediment loads in receiving waters	**No**	
		•Site specific vehicular traffic	**Yes**	
		•Increase in dust and noise from demolition and/or construction	**Yes**	
		•Construction waste	**Yes**	
		3. Acquisition of land **Not applicable**		
		•Encroachment on private property		
		•Relocation of project affected persons		
		•Involuntary resettlement		
		•Impacts on livelihood incomes		
		4. Hazardous or toxic materials		
		•Removal and disposal of toxic and/or hazardous demolition and/ or construction waste	**No**	
		•Storage of machine oils and lubricants	**Yes**	
		5. Impacts on forests and/or protected areas **Not applicable**		
		•Encroachment on designated forests, buffer and /or protected areas		
		•Disturbance of locally protected animal habitat		

Part II:

PICTORIAL EVIDENCE OF HEALTH AND SAFETY COMPLIANCE OF ADMINISTRATIVE BUILDING

Picture 1: Workers at the construction site



Picture 2: Construction materials at the Site

Picture 3: Safety and First Aid Instructions

PART-III: Action Plan for Compliance
Environmental Social Action Plan (ESAP) for Compliance

Sl	Issues	Current Status	Comments
1.	Documentation	Maintains Registrar of accidents, incidents.	Documents provided at the end of this Annex.
2.	Hazardous material storage	Hazardous material storage areas are not properly labelled, storage areas are not properly identified, and not protected from weather	Storage area should be clearly identified using labels. Sheds should be erected over the hazardous material (fuel) storage areas
3	Construction site housekeeping	There is poor housekeeping. Construction debris are scattered in several locations often blocking smooth vehicle movement. Construction materials are not covered, which may result in fugitive emission.	Housekeeping practice need to be improved (better site debris management, covering of loose construction materials etc)
4	Occupational health and safety	Some workers were seen working without wearing safety gears such as Boot.	This practice should be improved.

Environmental and Social Audit for Industries under Construction

3. Meghna Re-Rolling and Steel Mills Ltd.

Basic Information

SN	Item	Description
1	**Factory Name**	Meghna Re-Rolling and Steel Mills Ltd.
2	**Factory address**	Cumilla Economic Zone, Meghna, Cumilla
3	**Office address**	HS-15, Road, Gulshan-1, Dhaka.
4	**Contact Person:**	Mohammed Moniruzzaman/Hamidul Haque/Syedul Haque Sakib
5	**Telephone**	
6	**Cell**	01324415800 / 01727601092 /01313497701
7	**E-mail**	mohammed.moniruzzaman@mgi.org m / md-mazharul.islam@mgi.org
8.	**Website**	www.mgi.org
9.	**Category as per GoB ECR, 2023**	Red
10	**Category As per WB 4.03/IPFF-II ESPP Safeguard Policy Guideline**	**Category B (Medium Risk)**
11.	**Fire license**	Under processing.
12.	**ECC from DOE**	Not from DOE yet, under processing; Approval received from BEZA.

Site audit **Date: 12.10.2023**

Sl.	Site Audit	Issues	Yes/No	Comments
1	Site Inspection (Walk-Around)	**d.** Is the site well organized and maintained in good condition?	**Yes**	**Partly yes**
		e. Are quantities of chlorinated solvents (e.g. 1,1,1-trichloroethane) used on site and recorded?	**NA**	

Sl.	Site Audit	Issues	Yes/No	Comments
		f. Are quantities of cylinders with toxic/flammable residuals held on site kept to a minimum?	**NA**	
2	Resource use	**i.** Does your entity use energy such as electricity, oil, or gas? If yes, what is the usage rate per month?	**Yes**	Individual data are not available (Total Consumptions are shown in the CEZ)
		j. Does your entity use energy from any renewable energy source?	**No**	
		k. Does your entity use any chemicals in the manufacturing process?	**Yes**	Admixture(Construction chemical)
		l. Does your entity use water in the manufacturing process? If yes, what is the usage rate per month?	**Yes**	Individual data are not available (Total Consumptions are shown in the main report)
		m. Does your entity have any water conservation practice guideline?	**No**	
		n. Does your entity practice rainwater harvesting program?	**No**	
		o. Does your entity have any modification to the process to reduce wastewater generation?	**No**	
		p. Does your entity have any tree plantation program?	**Yes**	**Documents are attached (Layout of master plan)**
3	*Air Emissions*	**d.** Are suspected, detected or declared to the administration pollution defined or analyzed with request for remediation?	**Yes**	
		e. Are the conditions, processes, contamination acceptance level estimated or defined?	**No**	
		f. Are site processes and operations free of significant fugitive air emissions?	**Yes**	
4	*Water Discharges*	**c.** Does the entity discharge any liquid waste?	**No**	
		d. If the site's discharge of liquid effluent to ground, surface water	**NA**	

Sl.	Site Audit	Issues	Yes/No	Comments
		(including streams, rivers and lakes) meet DOE standard?		
5	*Solid & Hazardous Waste*	**f.** Does your entity have an inventory of both hazardous and Non-hazardous waste?	**No**	
		g. Does the site have details of where wastes are finally disposed of (including by-waste)?	**No**	
		h. Does the plant produce any hazardous waste?	**No**	
		i. Is the solid waste disposal carried out following the regulations?	**Yes**	**Documents are not provided**
		j. Are approved waste haulers/disposal authorities or companies being used?	**Yes**	**Documents are not provided**
6	*Storage*	**i.** Are containers storing hazardous materials in good condition?	**NA**	
		j. Are containers storing hazardous materials labelled properly?	**NA**	
		k. Are liquid hazardous materials stored on impervious surface?	**NA**	
		l. Are liquid hazardous materials stored with secondary containment (capable of volume of the largest stored container prevailing regulations and guidance)?	**NA**	
		m. Are storage areas well maintained?	**NA**	
		n. Are storage areas clearly identified?	**NA**	
		o. Are storage areas protected from weather as necessary?	**NA**	
		p. Does your entity keep regular inventory of stock entry and stock out items?	**Yes**	**Documents are not provided.**

Sl.	Site Audit	Issues	Yes/No	Comments
7	*Emergency planning and community relations*	**c.** Are the site emergency procedures regularly reviewed and exercised?	**Yes**	Photos are available
		d. Is the chain of incident commander responsibility clearly defined?	**No**	
		<u>*Hazardous substances*</u> d. Is there a program to eliminate, or if not possible reduce the use of hazardous substances?	**No**	
		e. Is there a list of the hazardous substances on site, plus information on handling, disposal, MSDS etc.	**No**	
		f. Does your entity, routinely or in specific circumstances, track chemical use through materials accounting or some other method as distinct from, or in addition to, tracking environmental releases?	**No**	
8	*Occupational Health and Safety*	g.Does your entity have guidelines/ documents for occupational health and safety practices?	**Yes**	**Documents are attached**
		h.Is there a program to eliminate, or if not possible reduce the hazardous work environment?	**No**	
		i. Are there any guidelines on preventive and protective measures against hazardous conditions for the workers?	**No**	
		j. Are there any documentations and reporting of occupational incidents, accidents, and diseases?	**Yes**	**Documents are attached (Accident/incident register)**
		k.Are there any occupational incidents, accidents, and diseases?	**No**	
		l. Is there any compensation program for occupational	Yes	Documents are not available

Sl.	Site Audit	Issues	Yes/No	Comments
		incidents including accidents and diseases?		
9	*Grievance Redress Mechanism*	Does your entity have guidelines/ documents to address Grievances of the employees/workers?	Yes	MGI's GRM Policy applicable (Annex J)
10	*Labor/Workers living Status*	Is there any labor camp/ housing at the construction site?	Yes	CuEZL provided temporary accommodation for the workers/labor at the site
10	*Other potential issues*	Will the site activity include/ involve any of the following potential issues and/or impacts?		
		1. Building rehabilitation **Not applicable**		
		•Site specific vehicular traffic		
		•Increase in dust and noise from demolition and/or construction		
		•Construction waste		
		2. New construction		
		•Excavation impacts and soil erosion	**No**	
		•Increase sediment loads in receiving waters	**No**	
		•Site specific vehicular traffic	**Yes**	
		•Increase in dust and noise from demolition and/or construction	**Yes**	
		•Construction waste	**Yes**	
		3. Acquisition of land **Not applicable**		
		•Encroachment on private property		
		•Relocation of project affected persons		
		•Involuntary resettlement		
		•Impacts on livelihood incomes		
		4. Hazardous or toxic materials		

Sl.	Site Audit	Issues	Yes/No	Comments
		•Removal and disposal of toxic and/or hazardous demolition and/ or construction waste	**No**	
		•Storage of machine oils and lubricants	**Yes**	
		5. Impacts on forests and/or protected areas **Not applicable**		
		•Encroachment on designated forests, buffer and /or protected areas		
		•Disturbance of locally protected animal habitat		

PART II: PICTORIAL EVIDENCE OF HEALTH AND SAFETY COMPLIANCE OF MEGHNA RE-ROLLING AND STEEL MILLS LTD

Picture 1: High voltage electric cable.

Picture 2: Signage of safe water.

Picture 3: Facility of first aid and drinking water.

Picture 4: Complaining mechanism on display.

PART-III: Action Plan for Compliance

Environmental Social Action Plan (ESAP) for Compliance

Sl	Issues	Current Status	Comments
1.	Documentation	**Many documents were not found.**	**Should practice good documentation process.**
2.	Hazardous material storage	**Hazardous material storage areas are not properly labelled, storage areas are not properly identified, and not protected from weather.**	**Storage area should be safely kept and clearly labeled.**
3	Construction site housekeeping	**Poor housekeeping. Construction materials were seen laid haphazardly, which might result in accidents.**	**Improve the housekeeping situation.**
4	Occupational health and safety	**Workers were not using proper safety measures such as boots during construction work.**	**Should follow the guidelines properly.**

Environmental and Social Audit for Industries under Construction

4. Meghna Glass Industries Ltd.

Basic Information

SN	Item	Description
1	**Factory Name**	**Meghna Glass Industries Ltd.**
2	**Factory address**	Cumilla Economic Zone, Meghna, Cumilla
3	**Office address**	HS-15, Road, Gulshan-1, Dhaka.
4	**Contact Person:**	Mohammed Moniruzzaman/Hamidul Haque/Syedul Haque Sakib
5	**Telephone**	
6	**Cell**	01324415800 / 01727601092 /01313497701
7	**E-mail**	mohammed.moniruzzaman@mgi.orgm / md-mazharul.islam@mgi.org
8.	**Website**	www.mgi.org
9.	**Category as per GoB ECR, 2023**	Red
10	**Category As per WB 4.03/IPFF-II ESPP Safeguard Policy Guideline**	**Category B (Medium Risk)**
11.	**Fire license**	Under processing
12.	**ECC from DOE**	Received Approval from BEZA ; Not yet from DOE which is required before operation

Site audit **Date: 12.10.2023**

Sl.	Site Audit	Issues	Yes/No	Comments
1	Site Inspection (Walk-Around)	**g.** Is the site well organized and maintained in good condition?	**Yes**	**Partly yes**
		h. Are quantities of chlorinated solvents (e.g. 1,1,1-trichloroethane) used on site and recorded?	**NA**	
		i. Are quantities of cylinders with toxic/flammable residuals held on site kept to a minimum?	**NA**	

Sl.	Site Audit	Issues	Yes/No	Comments
2	Resource use	**q.** Does your entity use energy such as electricity, oil, or gas? If yes, what is the usage rate per month?	**Yes**	Individual data are not available (Total Consumptions are shown in the main report)
		r. Does your entity use energy from any renewable energy source?	**No**	
		s. Does your entity use any chemicals in the manufacturing process?	**Yes**	Admixture (Construction chemical)
		t. Does your entity use water in the manufacturing process? If yes, what is the usage rate per month?	**Yes**	Individual data are not available (Total Consumptions are shown in the main report)
		u. Does your entity have any water conservation practice guideline?	**No**	
		v. Does your entity practice rainwater harvesting program?	**No**	
		w. Does your entity have any modification to the process to reduce wastewater generation?	**No**	**Not relevant**
		x. Does your entity have any tree plantation program?	**Yes**	**Documents are attached (Layout of master plan)**
3	*Air Emissions*	**g.** Are suspected, detected or declared to the administration pollution defined or analyzed with request for remediation?	**Yes**	**Spraying water for dust control**
		h. Are the conditions, processes, contamination acceptance level estimated or defined?	**No**	
		i. Are site processes and operations free of significant fugitive air emissions?	**Yes**	
4	*Water Discharges*	**e.** Does the entity discharge any liquid waste?	**No**	
		f. If the site's discharge of liquid effluent to ground, surface water (including streams, rivers and lakes) meet DOE standard?	**NA**	
5	*Solid & Hazardous Waste*	**k.** Does your entity have an inventory of both hazardous and Non-hazardous waste?	**No**	

Sl.	Site Audit	Issues	Yes/No	Comments
		l. Does the site have details of where wastes are finally disposed of (including by-waste)?	**No**	
		m. Does the plant produce any hazardous waste?	**No**	
		n. Is the solid waste disposal carried out following the regulations?	**Yes**	Documents are not provided
		o. Are approved waste haulers/disposal authorities or companies being used?	**Yes**	Documents are not provided
6	*Storage*	**q.** Are containers storing hazardous materials in good condition?	**NA**	
		r. Are containers storing hazardous materials labelled properly?	**NA**	
		s. Are liquid hazardous materials stored on impervious surface?	**NA**	
		t. Are liquid hazardous materials stored with secondary containment (capable of volume of the largest stored container prevailing regulations and guidance)?	**NA**	
		u. Are storage areas well maintained?	**NA**	
		v. Are storage areas clearly identified?	**NA**	
		w. Are storage areas protected from weather as necessary?	**NA**	
		x. Does your entity keep regular inventory of stock entry and stock out items?	**Yes**	Documents are not provided
7	*Emergency planning and community relations*	**e.** Are the site emergency procedures regularly reviewed and exercised?	**Yes**	Photos are available
		f. Is the chain of incident commander responsibility clearly defined?	**No**	
		Hazardous substances g. Is there a program to eliminate, or if not possible reduce the use of hazardous substances?	**No**	

Sl.	Site Audit	Issues	Yes/No	Comments
		h. Is there a list of the hazardous substances on site, plus information on handling, disposal, MSDS etc.	**No**	
		i. Does your entity, routinely or in specific circumstances, track chemical use through materials accounting or some other method as distinct from, or in addition to, tracking environmental releases?	**No**	
8	*Occupational Health and Safety*	m. Does your entity have guidelines/ documents for occupational health and safety practices?	**Yes**	**Documents are attached**
		n.Is there a program to eliminate, or if not possible reduce the hazardous work environment?	**No**	
		o.Are there any guidelines on preventive and protective measures against hazardous conditions for the workers?	**No**	
		p. Are there any documentations and reporting of occupational incidents, accidents, and diseases?	**Yes**	**Documents are attached (Accident/incident register)**
		q. Are there any occupational incidents, accidents, and diseases?	**No**	**Documents are attached (Accident/incident register)**
		r. Is there any compensation program for occupational incidents including accidents and diseases?	Yes	Documents are not available
9	*Grievance Redress Mechanism*	Does your entity have guidelines/ documents to address Grievances of the employees/workers?	Yes	MGI's GRM Policy applicable (Annex J)
10	*Workers/Labor living Status*	Is there any labor camp/ housing at the construction site?	Yes	CuEZL provided temporary accommodation for the workers/labor at the site
9	*Other potential issues*	Will the site activity include/ involve any of the following potential issues and/or impacts?		
		1. Building rehabilitation **Not applicable**		
		•Site specific vehicular traffic		

Sl.	Site Audit	Issues	Yes/No	Comments
		•Increase in dust and noise from demolition and/or construction		
		•Construction waste		
		2. New construction		
		•Excavation impacts and soil erosion	**No**	
		•Increase sediment loads in receiving waters	**No**	
		•Site specific vehicular traffic	**Yes**	
		•Increase in dust and noise from demolition and/or construction	**Yes**	
		•Construction waste	**Yes**	
		3. Acquisition of land **Not applicable**		
		•Encroachment on private property		
		•Relocation of project affected persons		
		•Involuntary resettlement		
		•Impacts on livelihood incomes		
		4. Hazardous or toxic materials		
		•Removal and disposal of toxic and/or hazardous demolition and/ or construction waste	**No**	
		•Storage of machine oils and lubricants	**Yes**	
		5. Impacts on forests and/or protected areas **Not applicable**		
		•Encroachment on designated forests, buffer and /or protected areas		
		•Disturbance of locally protected animal habitat		

PART II: PICTORIAL EVIDENCE OF HEALTH AND SAFETY COMPLIANCE OF GLASS INDUSTRIES LTD

Picture 1: High voltage electricity connections.

Picture 2: Workers without protective shoes.

Picture 3: Construction site without proper fencing and protection.

PART-III: Action Plan for Compliance

Environmental Social Action Plan (ESAP) for Compliance

Sl	Issues	Current Status	Comments
1.	Documentation	Many Documents were not found.	Should practice good documentation.
2.	Hazardous material storage	Non-compliant	To be improved for compliance
3	Construction site housekeeping	Not up to requirements	To be improved for compliance
4	Occupational health and safety	Partly non-compliant	To be improved for compliance

	Cumilla Economic Zone Meghna, Cumilla	Doc No	MGI/CEZ/Med-REG-01
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Issue Date: 30/09/2023

Accident/Incident Register

S/N	Victim's Name, Designation & ID No.	Date & Time	Accident/ Incident	Summary & Root Cause	Date of Returning to Work	Period of Absence	Medical Center/ Doctor's Name	Risk	Remarks
01	Iqbal Hossain Store Keeper 079960	10.03.22 11.00 AM	Accident	Worker tripped and fall due to poor housekeeping issue. Injured patient got hit on his elbow. **Root Cause:** 1. Poor Supervision 2. Poor Housekeeping	10.03.22	3 Hours	MGI Factory Complex Primary Medical Center	Medium	
02	Shiplur Rahman Limon Rig Operator 087002	19.07.22 12.30 PM	Incident	A workman feeling sick and dizziness due to dehydration. After taking ORS and 30 min rest, worker joined at work again. **Root Cause:** 1. Negligence Safety Rules 2. Lack of Supervision	19.07.22	2 Hours	MGI Factory Complex Primary Medical Center	Low	
03	Kamal Hossain Howladar Payloader 053364	10.08.22 04.30 PM	Accident	Payloader stacked at lose ground, during rescuing operator got hit by re-bar and cause small laceration on his right arm. **Root Cause:** 1. Lack of Supervision 2. Over Confidence	11.08.22	1 Day	MGI Factory Complex Primary Medical Center	Low	

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S/N	Victim's Name, Designation & ID No.	Date & Time	Accident/ Incident	Summary & Root Cause	Date of Returning to Work	Period of Absence	Medical Center/ Doctor's Name	Risk	Remarks
04	Not Applicable	22.02.23 05.30 PM	Accident	Cutting work on the top of the steel structure on going, in this mean time Sparks of fire fallen from top and hose pipe was slightly burn. **Root Cause:** 1. Lack of Supervision and Inspection Cutting work on the top of the steel structure on going, in this mean time Sparks of fire fallen from top and hose pipe was slightly burn. **Root Cause:** 1. Lack of Supervision and Inspection 2. Negligence	N/A	N/A	N/A	**Medium**	
05	Not Applicable	14.07.23 04.30 PM	Near Miss	Scaffolding pipe slipped and fall down from height while lifting. This is a high potential near miss. **Root Cause:** 1. Poor Supervision 2. Shortcut Working Tendency	N/A	N/A	N/A	**Medium**	