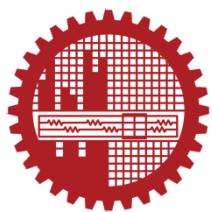


**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT  
(ESIA)  
OF  
CUMILLA ECONOMIC ZONE LIMITED**

**FINAL REPORT**

**VOLUME II: MAIN REPORT**



**PREPARED BY**

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## **Abbreviations**

BEZA	Bangladesh Export Processing Zone
BTCL	Bangladesh Telecommunication Company Limited
BOD	Biochemical Oxygen Demand
CEO	Chief Executive Officer
CETP	Central Effluent Treatment Plant
COD	Chemical Oxygen Demand
COO	Chief Operating Officer
CSTP	Central Sewage Treatment Plant
CuEZL	Cumilla Economic Zone Limited
DoE	Department of Environment
ECA	Environmental Conservation Act
ECC	Environmental Clearance Certificate
ECR	Environmental Conservation Rule
EHS	Environment, Health and Safety
EHSG	Environmental, Health and Safety Guidelines
ERP	Emergency Response Plan
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
EZ	Economic Zone
FGD	Focus Group Discussion
FTP	Fume Treatment Plant
GHG	Green House Gas
GOB	Government of Bangladesh
GRM	Grievance Redress Mechanism
HR	Human Resources
ICP	Informed Consultation and Participation
ILO	International Labor Organization
IM	Informal Meeting
IPCC	Intergovernmental Panel on Climate Change
IPFF-II	Investment Promotion and Financing Facility -II
IUCN	International Union for Conservation of Nature
KII	Key Informant Interview
LRP	Livelihood Restoration Plan
MD	Managing Director
MGI	Meghna Group of Industries
NGO	Non-Government Organization

OHS	Occupational Health and Safety
OHSP	Occupational Health and Safety Plan
OP	Operational Policy
PAP	Project Affected Person
PCR	Physical Cultural Resources
PFI	Private Finance Initiative
PM	Particulate Matter
PSI	Performance Standard Indicator
SPM	Suspended Particulate Matter
STP	Sewage Treatment Plant
TDC	Temporary Drainage Congestion
TDS	Total Dissolved Solids
ToR	Terms of Reference
TSDF	Treatment Storage Disposal Facility
VOC	Volatile Organic Carbon
WBG	World Bank Group
WTP	Water Treatment Plant

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# **Chapter 1**

## **INTRODUCTION**

### **1.1 Background**

Meghna Group of Industries (MGI), one of the largest and leading conglomerates of Bangladesh, has proposed to develop Cumilla Economic Zone (CuEZL) at site located in Sonachar Mauza, Luterchar Union, Meghna Upazila, Cumilla District, Chittagong Division, along Dhaka-Chittagong Highway. Upcoming Economic Zone (EZ) will cover the total area of 246.3615 acres of land. These land areas were treated as ‘Null’ land (agricultural) by local AC Land Office. It is proposed to have primarily apparel, agro-based industry, leather goods manufacturing, glass industry, re-rolling and steel mills, furniture, plastic items, power plant, etc. This area will be developed by MGI prospective developer and with the aim of targeting non-polluting industries. At present, the CEZ intends to develop on-site and off-site facilities for the EZ so that “ready to develop” land is available for industrialists and investors for establishing industries and developing the EZ. A developer will be appointed for EZ development as per EZ Act, 2010. An appointed developer will be responsible for developing the EZ according to the master plan.

The formation of this Economic Zone is in line with the initiative proposed by the Government of Bangladesh (GoB) for the creation of Economic Zones (EZ) across the country for manufacturing various products for both export and local markets. Successful examples from around the world as well as Bangladesh’s own positive experience with the EPZ model had encouraged the GoB to develop this new EZ paradigm for Bangladesh to promote economic development. A public-private partnership model would be the mode of choice in the financing, developing, managing and servicing of EZs. As a part of this initiative, Bangladesh Economic Zone Authority (BEZA) has granted a license for the development of Cumilla Economic Zone Ltd (CuEZL) for Meghna Group of Industries (MGI).

The CuEZL authority is also seeking for finances from private and other lenders including World Bank. World Bank financing requires the project to comply with certain regulations and standards for sustainable development. All the operations related to projects should be carried out in an environmentally responsible manner that comply with all national environment legal obligations and appropriate World Bank guidelines. In this regard, the developments in the CuEZL project should conform to the Performance Standards for Private Sector Activities (OP 4.03). As part of the World Bank funding guidelines, an Environmental and Social Impact Assessment (ESIA) should be carried out to address the environmental and social issues of the project following operational procedures, policies, guidelines and statements set by the World Bank.

### **1.2 Objective**

The objective of the study is to prepare a detail ESIA for the CuEZL project to address the associated environmental and social issues. The ESIA has been prepared to ensure that the project conforms to the all national laws, rules, regulations and standards such as ECA 1995, ECR, 2023 as well as the World Bank Operational Policies (OP 4.03) Environmental Health and

Safety (EHS) guidelines. The ESIA focuses on the applicability of these rules in the appropriate scenarios so that, the project would be in compliance with the national standards and the World Bank's guidelines. The ESIA also formulates an Environmental and Social Management System (ESMS) which would allow to avoid or minimize impacts on the environment and the society.

### **1.3 Scope of work**

The scope of the ESIA study is outlined as below:

- Screening of the Project based on applicable reference framework based on reconnaissance survey and fieldbased assessment of WB OP4.03;
- Scoping for the ESIA study by identifying the applicable PSs;
- Development of a regulatory, policy and administrative framework relevant to the Project;
- Collection, analysis and reporting of the environmental and social baseline data of the study area including consultation with local communities and other stakeholders;
- Assessment of the environmental impacts of the Project in the study area;
- Assessment of social impacts on the local community as well as project affected people (if any) and any other stakeholders, which have been identified during the social consultation process;
- Risk assessment and consequence analysis of the Project;
- Formulation of an Environment and Social Management Plan and associated/specific mitigation plans for identified impacts; and
- Formulation of Emergency Response Plan and Grievance Redress Mechanism for the Project.

### **1.4 Methodology**

#### **1.4.1 Categorization**

As the first step, the Terms of Reference (ToR) (Annex-i) provided by the Client was reviewed and project screening and scoping exercise have been undertaken to categorize the project according to the Department of Environment, GoB and the World Bank. The initial environmental and social screening of this subproject as a requirement of IPFF-II was conducted at the beginning of this study and is presented in Annex-ii. According to the Environmental Conservation Rules (ECR), 2023 of the Department of Environment (DoE), Bangladesh, the project will fall under “Red Category” as there will be different types of industries with potential to have significant negative impacts on environment. Therefore, it is mandatory to conduct an Environmental Impact Assessment (EIA) for obtaining an environmental clearance certificate.

According to World Bank, this project will require a comprehensive ESIA following the World Bank Operational Policies OP 4.03 addressing the eight Performance Standards adopted from the IFC to ensure that the project is environmentally sound and sustainable. There is difference in project categorization as per WBG PS and GOB rules (ECR, 2023). Table-1.1 shows different categories sub-projects descriptions in brief.



**Table-1.1: E&S Risk Rating of Sub-projects under IPFF-II**

<b>Category</b>	<b>Description</b>
High risk	<p>Sub-projects that are likely to have significant adverse E&amp;S impacts that are diverse<sup>1</sup>, irreversible<sup>2</sup>, or unprecedented<sup>3</sup>.</p> <p>Examples of significant impacts can be impacts on critical habitats, impacts on vulnerable groups or ethnic minorities, large-scale involuntary resettlement or economic displacement, or critical cultural heritage.</p> <p>PIFs will always rate sub-projects that may involve activities on the List of E&amp;S Sensitive Activities as High risk. It should be noted that there may be other high risk situations beyond those included in this List. Therefore, E&amp;S risk rating will be based on a confluence of various factors in specific sub-project circumstances where sector of operation represents only one of many considerations. Both specific nature of impacts and their scale should be considered.</p>
Medium risk	<p>Sub-projects that are likely to have adverse E&amp;S impacts that are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures and international best practice. Potential adverse environmental and/ or social impacts on communities or environmentally important areas are smaller in scale than those of High Risk transactions.</p>
Low risk	<p>Sub-projects that do not have the characteristics of High or Medium risk sub-projects are classified as Low risk category and typically involve business activities with minimal or no adverse E&amp;S impacts.</p> <p>While PIs would have Low risk rating within their overall ESMS, IPFF II sub-projects may not be rated Low risk.</p>

Note:

<sup>1</sup>Diverse impacts – impacts resulting on multiple E&S components or receptors over a varying time and spatial scale (e.g. activities that can cause large scale adverse impacts on local air quality, noise levels, generation of hazardous wastes as well as nuisance to community).

<sup>2</sup>Irreversible impacts – impacts on E&S components that, in all practical terms are permanent in nature and cannot be reversed in spite of the removal of the causal stress factor (e.g. construction or change in land use that permanently destroys habitats used by critically endangered species in accordance with IUCN Red List).

<sup>3</sup>Unprecedented impacts – are impacts that are first of its kind in terms of available knowledge of their potential to cause harm to the E&S components and their effective mitigation (e.g. impact of noise pollution on an endangered faunal species in a geographical region where no prior studies are available on impact tolerance and response of the species). In the present case it is the e-waste, as no facility for dealing with such waste exist in the country.

The next step of the scoping exercises the Team of Consultants set-out to identify the parameters needed to be considered for the study and to outline the activities for collecting and analyzing data on each parameter of physico-chemical, ecological, environmental and socio-economic aspects. Geographical area to be covered has been identified in consultation with the client.

#### 1.4.2 Scoping

Scoping was done for:

- Categorization of the project according to Environment Conservation Rules, 2023 (ECR '23) and the World Bank.
- Identifying and procuring institutional information.
- Information collection through discussions/meetings with WB, MGI, Bangladesh Bank, PIs, ADB, etc. to define scope for the impact assessment,
- Planning and implementation of mitigation and monitoring,

- Confirmation of the environmental categorization of the project along with selecting the type of ESIA documents to be prepared (Full ESIA, ESMS, etc.) as required under the ECR '23.
- Confirmation of the applicability of the Performance Standards set forth by the World Bank as requirements of the OP 4.03.
- Confirmation whether Resettlement Action Plan (RAP) or voluntary dispossession or negotiated settlement is required.

### **1.4.3 Screening**

The steps followed in screening include:

- Desk review of the relevant documents and available imagery of the project site and its surroundings,
- Reconnaissance survey of the site, surrounding areas, approach road and informal discussions with local stakeholders,
- Discussions with World Bank, Bangladesh Bank, Design Consultants of the Client and Department of Environment (DOE) to update the regulatory requirements and formats/methods, etc.,
- A preliminary stakeholder mapping exercise to identify key stakeholders from the relevant Governmental Agencies, Non-Governmental Organizations (NGOs), Local Community Representatives. This information has been used for consultation during different stages of the project.
- Planning of Environmental and Social Auditing of selected industries in the CuEVL.
- Categorization of subproject for the purpose of ESIA.
- Preliminary identification of the World Bank Operational Policies triggered by the project, e.g.:
  - Location of the project – in eco-sensitive area or not
  - Labor engagement
  - Presence of indigenous peoples in the impact area or not
  - Cultural heritage sites affected or not
  - Land acquisition and/or Involuntary resettlement involved or not

Based on the scoping and screening activities the Table-1.2 below was prepared to list the studies and work streams required for compliance with WBG PS and other relevant WBG guidelines. The relevant PS and guidelines involved are noted in each case.

**Table-1.2: List of Studies and Work Streams Required for Compliance with WBG PS**

<b>Sl. No.</b>	<b>Study Items/Topics</b>	<b>Applicable WBG PS and other guidelines</b>	<b>Reference Chapter/Annex</b>
1	Project Description & Study of the project's Area of Interest for Environmental and Social Setting and Scoping.	This is part of screening, which is a vitally important tool for visualizing and understanding potential environmental and social impacts, as it can help to identify significant issues for the project, and spotlight what issues to monitor and	Chapters -1, 2 and Annex A

<b>Sl. No.</b>	<b>Study Items/Topics</b>	<b>Applicable WBG PS and other guidelines</b>	<b>Reference Chapter/Annex</b>
		prioritize for studies needed and risk analysis. Year-wise phase implementation schedule should be provided. Applicable Standards/Guidelines: PS1, WBG EHSG	
2	Audit of works in progress in the project area.	As this is not a green field project and an audit for all environmental and social activities needs to be done. Applicable Standards/Guidelines: PS1-PS8	Chapter 4, Annex B and F
3	Legal and Policy Framework	Applicable Standards/Guidelines: PS1	Chapter3, Annex C
4	Baseline Studies	Applicable Standards/Guidelines: PS1, PS3	Chapter 4, Annex B
5	Water Resources and water pollution potential Study	Applicable Standards/Guidelines: PS3, WBG EHSG	Chapter 4, Annex B, Annex R
6	Air Quality study	Applicable Standards/Guidelines: PS3, WBG EHSG	Chapter 4, Annex B
7	Climate Change Risk Assessment and GHG Emission Assessment	Applicable Standards/Guidelines: PS3, IPCC Assessment Reports (2014 and 2018)	Chapter4, Annex D,Annex Q
8	Noise Pollution Study	Applicable Standards/Guidelines: PS3, WBG EHSG	Chapter 4, Annex B
9	Seismicity	Applicable Standards/Guidelines: PS3, WBG EHSG	Chapter 4, Annex B
10	Soil Characteristics Assessment	Applicable Standards/Guidelines: PS3, WBG EHSG	Chapter 4, Annex B
11	Flood Potential Assessment	Applicable Standards/Guidelines: PS3, WBG EHSG	Chapter 4, Annex B
12	Cumulative Impact Assessment	Applicable Standards/Guidelines: PS3	Chapter 4
13	Labor, Human Rights and Gender Assessment	Applicable Standards/Guidelines: PS2	Chapter 3, Annex B, Annex G, Annex O
14	Community Health, Safety (including Hazardous materials) and Security Review	Applicable Standards/Guidelines: PS3, PS4, WBG EHSG	Chapter 4, Chapter 7, Annex O, Annex J, Annex Q
15	Indigenous People status Review	Applicable Standards/Guidelines: PS7	Not Applicable
16	Critical Habitat Review and Ecosystem Services Assessment	Applicable Standards/Guidelines: PS6, IUCN Guidelines	Annex B, Chapter 4, Chapter 7
17	Cultural Heritage (both tangible and intangible) Assessment	Applicable Standards/Guidelines: PS8	Chapter 4, Annex B
18	Stakeholder engagement plan (SEP) including Grievance Redress	Applicable Standards/Guidelines: PS1, PS5	Chapter 7, Annex J, Annex L

<b>Sl. No.</b>	<b>Study Items/Topics</b>	<b>Applicable WBG PS and other guidelines</b>	<b>Reference Chapter/Annex</b>
19	Consideration of Alternatives	Applicable Standards/Guidelines: PS1	Chapter 5
20	Resettlement Action Plan (RAP)	Applicable Standards/Guidelines: PS5	(May not be Applicable) Chapter 4, Annex F, Annex G and Annex H
21	Environmental and Social Action/ Management Plan (including EHS, Community EHS, Fire safety, Traffic Safety, Emergency Response and Preparedness, Monitoring)	The management plan can be a phased program depending on the activities in the project. Applicable Standards/Guidelines: PS1, PS3, PS4. PS6. PS8. EHS guidelines	Chapter 7, Annex H, Annex I, Annex K, Annex O, Annex N, Annex R

#### **1.4.4 Consultation Meetings**

A number of consultation meetings was held as a part of the scoping process. The Team of Consultants from BRTC, BUET and relevant focal persons of Cumilla Economic Zone Limited sat several times at Civil Engineering Department, BUET in order to clarify many issues and collecting information related to the CuEZL project.

#### **1.4.5 Reconnaissance Survey and Data Collection Scheming**

- First reconnaissance survey of the site and the surrounding area was conducted in the last week of April, 2019 to ascertain the extent of the study area and to identify the studies to be conducted to fulfill the requirements of the ESIA. In the field surveys, GPS has been extensively used for geo-referencing the site specific structures.
- Relevant information about the project area and baseline data have been gathered through detailed physical survey during May, 2022 and October 2023.
- Additional information was collected from published literature.
- In addition, data and information were also collected from different government and non-government organizations.

#### **1.4.6 Baseline Data Collection**

An environmental and social baseline survey has been carried out to gather information on the existing physicochemical, biological, and socio-economic environment of areas surrounding the proposed area. These data collection campaign were as follows:

- Identification of the monitoring locations for air, water and noise for sensitive receptors, and at key locations for water intake and outfall, etc.;
- The baseline data collection, monitoring and analysis for environmental parameters was completed during the period from end of April 2019 and May 2022.
- Ecological and Socio-economic data collection and public consultations were carried out in September, 2022.

- Secondary data was also collected from different government departments, local bodies and through literature surveys etc.; and
- All the data was compiled and compared with applicable standards where relevant, and is presented in this report;
- Stakeholder consultation was completed with the intent of collecting baseline information on the environmental and social conditions and sensitivities, developing a better understanding of the potential impacts, informing the public of the proposed project and to gain an understanding of the perspectives/concerns of the stakeholders;
- Environmental and Social Auditing and Construction Auditing were done in December, 2022 and October, 2023.
- A summary of the stakeholder engagement process and the profile of the groups and their opinions forms a part of the Information Disclosure, Consultation and Participation Chapter of this report; and
- Information gathered was used for formulating mitigation measures and environmental and social management plan/s.

#### **1.4.7 Impact Assessment and Mitigation Measures**

- Analysis of the baseline results and the incremental impacts of the project were assessed in accordance with the Bangladesh national guidelines for air, water and noise emissions; standards stipulated in the Environment Conservation Rules (ECR,2023) and amendments thereof and with reference to the World Bank's Performance Standards, WB Safeguard Policies, IFC's Environmental, Health and Safety (EHS) Guidelines, including the General Guidelines;
- The impact assessment involved the prediction and evaluation of impacts from the project in different phases, including site preparation, construction and operation phase, decommissioning of project and included consideration of mitigation measures towards the same;
- Impact prediction covered residual impacts (impacts remaining after all possible mitigations have been incorporated) and took into account control measures that are part of the project design (e.g. acoustic enclosures for major equipment). Additional measures aimed at further avoiding, minimizing and mitigating predicted impacts were proposed where necessary or appropriate;
- Impact assessment also involved risk assessment covering hazard identification, consequence analysis and risk reduction measures and recommendations; and
- Impacts have been further classified as insignificant, minor, moderate or major based on the criteria for rating of impacts.

#### **1.4.8 Analysis of Alternatives**

Analysis of alternative options was considered to minimize impacts of the project while undertaking the ESIA study. The alternative options assessed in the study ranged from technology, transportation methods, project site and operations, including the no project alternative. Alternatives are considered in terms of their potential environmental impacts, the

feasibility of mitigating these impacts alternatives for mitigation measures for high residual impact/risk, if any etc.

#### **1.4.9 Management Plans and Grievance Redress Mechanism**

- Environmental and Social Management Plan (ESMP) were developed for the mitigation measures suggested and included defined roles and responsibilities for implementation;
- A Grievance Redress Mechanism (GRM) was developed to address any complaints and concerns from all stakeholders;
- Based on the risk assessment, risk reduction measures and recommendations for an emergency response and preparedness plan were also developed; and
- ESMP also addressed the Institutional review, finalization of EMP and grievances.

#### **1.4.10 Information/Data Sources**

Key relevant information sources have been summarized in Table 1.3.

**Table 1.3: Key Data Sources**

Parameters	Information sources	Remarks
Project Background, Technical details on project and associated components	<ul style="list-style-type: none"> <li>• Project specification documents of CuEZL from Meghna Group of Industries</li> <li>• Project Execution milestones, Plot Plan layout, Organizational Structure</li> </ul>	Meghna Group of Industries provided other information required during the course of the study
Study area features and sensitivities	<ul style="list-style-type: none"> <li>• Ground physical survey</li> <li>• Satellite images</li> <li>• National web portal of Bangladesh</li> </ul>	Details of the satellite data used is included in Baseline Chapter
Legal framework	<ul style="list-style-type: none"> <li>• Department of Environment</li> <li>• Board of Investment, Bangladesh</li> <li>• IFC and WB documents</li> </ul>	In discussion with the DOE and local Govt. departments, WB and
Land use /Land cover Details, Meteorology and climatic conditions	<ul style="list-style-type: none"> <li>• Ground Physical Survey</li> <li>• GIS based land-use analysis</li> <li>• Bangladesh Meteorological Department</li> <li>• Observatory Surface Meteorological Data</li> </ul>	Details of the satellite data used is included in Baseline chapter
Geology, Topography, Hydrology and Drainage	<ul style="list-style-type: none"> <li>• CuEZL Feasibility reports, Location Map</li> <li>• Bangladesh Water Development Board</li> <li>• Web portal of National Encyclopedia of Bangladesh (Banglapedia)</li> </ul>	In association with field Observations
Natural hazards	<ul style="list-style-type: none"> <li>• Web portal of National Encyclopedia of Bangladesh (Banglapedia)</li> <li>• Bangladesh Meteorological Department</li> </ul>	Included in consultation with Locals
Environmental baseline as Air quality, water quality, soil and sediment quality	<ul style="list-style-type: none"> <li>• Primary data collection</li> <li>• Applicable Standards from DOE, Bangladesh</li> </ul>	Baseline data collection was completed in April 2019 and May 2022.
Ecological parameters	<ul style="list-style-type: none"> <li>• Primary and Secondary data collection, observations, surveys and local</li> </ul>	Data collection was carried out in the month of September,

<b>Parameters</b>	<b>Information sources</b>	<b>Remarks</b>
	consultations • Websites of birdlife international • IUCN Data base	2022, Endangered, critical status was checked from the website: <a href="http://www.iucnredlist.org">www.iucnredlist.org</a>
Social-economic parameters	<ul style="list-style-type: none"> <li>• Primary data collection surveys, extensive consultations, meetings and discussions held with stakeholders</li> <li>• Bangladesh population Census for 2011</li> <li>• Fisheries Census data</li> <li>• Land Regulation Policy, Bangladesh</li> <li>• Land Acquisition and Compensation data for the project site</li> <li>• Website of Department of Social Services</li> <li>• Web portal of National Encyclopedia of Bangladesh (Banglapedia)</li> </ul>	Primary Socio-economic Survey was carried out in month of September 2022. Details provided in baseline environmental and social conditions chapter.
Environmental Auditing	<ul style="list-style-type: none"> <li>• Primary data collection at selected industries currently under operation</li> </ul>	Primary environmental auditing was conducted in December 2022.

## **1.5 THE ESIA REPORT**

The ESIA report has been prepared following the World Bank OP 4.03 as well as addressing the ADB Safeguard Policy Statement (2009). The first Chapter (Chapter 1) of this ESIA report describes the background and objectives of the project. It also presents an outline of the methodology followed for carrying out ESIA. Chapter 2 presents a detail description of the project including the major activities to be carried out during both construction and operation phases of the project. Chapter 3 presents an overview of policy, legal and administrative framework relevant to the project. Chapter 4 presents identification and assessment of the potential environmental, ecological and socio-economic impacts of the proposed project, both during construction and operation phases. Chapter 5 presents the alternative options for the proposed project. Chapter 6 presents the Information Disclosure along with outcome of public consultations and communications carried out as a part of the environmental assessment. Chapter 7 presents the mitigation measures for enhancement of positive impact and reduction or elimination of negative impacts. It also presents the Environmental and Social Management System (ESMS), including the Environmental Management Plan (EMP) and the Monitoring Plans for both construction and operational phases along with the Occupational Health and Safety Plan and Emergency Preparedness Plan. Chapter 8 provides the Gap Analysis and Action Plan through comparison between OP4.03 Standards and observation with recommendations as well as Environmental and Social Commitment Plan. The final Chapter (Chapter 9) of the ESIA report presents the conclusions of the environmental assessment of the proposed project.

## Chapter 2

# PROJECT DESCRIPTION

### 2.1 Introduction

Cumilla Economic Zone Limited (CuEZL) was incorporated in 2017, which obtained the pre-qualification license to establish the Economic Zone at Meghna Upazila, Cumilla in 2016. The main objective of the project is to develop an economic zone of international standards for promoting investment. The potential sites for the development of EZs are identified through careful consideration of various factors such as land use, land ownership, accessibility and connectivity, linkage to economically important towns/cities, infrastructure availability and engineering, environmental and social feasibility of the site. Considering these various aspects, the site for the CuEZL is selected at Luterchar Union, Meghna Upazila, Cumilla.

### 2.2 Location and Land

Cumilla Economic Zone (CuEZL) is located south of Meghna Bridge, abutted by the Meghna-Homna road. The zone is only 600 Meters from the Dhaka-Chittagong highway. The area is located in Sonachar Mauza, Luterchar Union, Meghna Upazila, Cumilla District under Chittagong Division. The CuEZ will cover a total area of 246.3615 acres of land. The land area is purchased by Meghna Group of Industries. The Meghna-Homna road passes through the proposed site dividing the zone into two distinct pieces. The Northern part of the CuEZ is termed as Block A and the Southern part of the zone is termed as Block B. This area will be developed with the aim targeting non-polluting industries. At present CuEZL intends to develop on-site and off-site facilities (guest house, recreation club, lawn etc.) for the EZ so that “ready to develop” land is available for industrialists and investors for establishing industries. Figure 2.1 shows the location of the project area and Table 2.1 presents the GPS co-ordinates of the CEZ area.



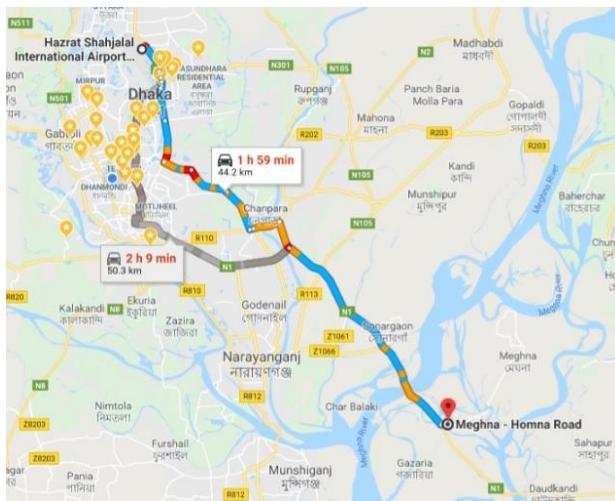
**Figure 2.1:** Location Map of Cumilla Economic Zone Limited from Google Map

**Table2.1:** GPS Coordinates and surroundings of CuEVL site

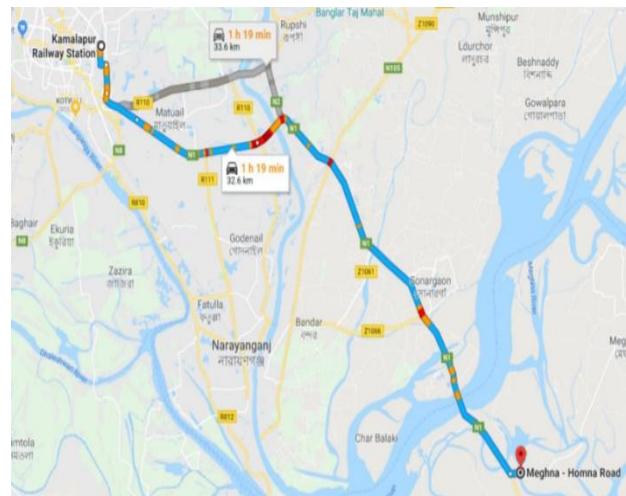
Side	Object	GPS Points	Coordinate	Distance
North	Meghna River Branch	NW Corner	23°35'5.08"N 90°38'45.52"E	The boundary is adjacent to the river branch
	Char land and some households.	NE Corner	23°35'2.81"N 90°39'10.40"E	Adjacent to the boundary
South	Meghna River Branch and Bashundhara Paper Mills	SW Corner	23°34'24.95"N 90°39'2.38"E	Adjacent to Meghna River Branch boundary
East	Meghna River Branch	SE Corner	23°34'21.60"N 90°39'34.63"E	Adjacent to boundary
West	Baterchar Bridge and Meghna River Branch	NW Corner	23°34'48.46"N 90°38'46.29"E	Adjacent to boundary

### 2.3 Connectivity

Luterchar Union has very good connectivity through road network and waterways. The proposed site is on the western boarder of the union, on the bank of the Meghna river branch. It is just 600 Meters from the Dhaka-Chittagong four lane highway and four and half Kilometer from the Meghna Bridge 1. The Hazrat Shahjalal International airport is 44 KM away (Figure 2.2). The Kamalapur railway station is about 33 Km from the zone (Figure 2.3). There are several industries located within 10 KM radius of the proposed zone. Overall transportation network of the zone is conducive to industrial development.



**Figure 2.2:** Driving distance from CuEVL to Hazrat Shahjalal International Airport



**Figure 2.3:** Distance from CuEVL to Kamalapur Railway Station

### 2.4 Construction Activities

The CuEVL authority is developing the zone and will start commercial operation as soon as possible. So they are going to develop the total 246.3615 acres of land at a go. The land filling operation has

already been completed using dredged materials (mostly sand) from the River Meghna which would serve dual purpose. The rivers will get necessary depth for river transportation and the environment will become better suited for aquatic ecosystem. The infrastructure development is also going on. The zone is being developed in a single phase, so no phased development plan is required.

## 2.5 Planning Framework

The objective of CuEZR is to provide all necessary facilities to the investors for establishment of manufacturing concerns. For that it will establish necessary supporting infrastructure that would be required for operation. For this, seven major land use divisions are considered, which is presented in Table 2.2. These are Industrial area (74.64% of total area), Commercial area (0.07% of total area), Residential Area (1.81% of land area), Administrative Building (0.06 of total area), Utility and Amenities (4.02% of total area), Green Space (7.65% of total area) and Internal Road, Footpath and Walkway (11.76% of total land area). Although residential area is not permitted in Economic Zones, but here in CuEZR, residential area is marked for the Dormitory of the Staff and Workers and Guest Houses for the investors and personnel to stay for a short period, who may come for business and training purpose and is approved by EZ Authority.

**Table 2.2:** Major Land-use Divisions of CuEZR

S.L No	Nature of Land Use	Plot Area (Acre)	Plot Area (m <sup>2</sup> )	Percentage
1	Industrial	183.88	744,137	74.64%
2	Commercial	0.17	688	0.07%
3	Residential	4.45	18,009	1.81%
4	Administrative Building	0.16	647	0.06%
5	Utilities & Amenities	9.9	40,064	4.02%
6	Green Space	18.84	76,243	7.65%
7	Internal Roads, Footpath & Walkway (Common Areas)	28.96	117,197	11.76%
<b>TOTAL AREA</b>		<b>246.36</b>	<b>996,984</b>	<b>100.00%</b>

The Master Plan proposals for the physical, economic, and social development of Cumilla Economic Zone are based upon the following planning and development objectives.

- To provide adequate light, air, and open space for all investors.
- To ensure safety from fire, flood, panic, and other natural and man-made disasters.
- Preservation, conservation and development of areas of natural scenery and landscape
- To ensure that development within the Economic Zone does not conflict with any development regulation.
- To encourage energy efficient site designs
- Maintenance of highest standards of environmental planning.
- Protection of natural resources and environmental assets through land use and development regulations

The various industrial sectors have been identified through the demand assessment carried out by the CuEVL authority. The suggestive target sectors identified are:

- Food Processing
- RMG and Textiles
- Vehicle and Parts Manufacturing
- Leather Goods and Footwear
- Plastic Articles
- Machineries/ Electronic Equipment / Light Engineering
- Glass Industry
- Re-rolling and Steel Mills
- Pharmaceuticals
- Beverage and Mineral water
- Packaging and Film Industries
- Tiles and Ceramic
- IT enabled Services
- IT and Computer related Equipment
- Electronics Equipment and Assembling
- Mobile, Telephone and Assembling

The planning exercise will consider the needs of those particular sectors and propose the infrastructure facilities according to that. In order to develop CuEVL equipped with world class facilities certain principles have been followed during the master planning process:

- Create high quality infrastructure in pockets
- Designate broad land use distribution of the whole site
- Evolve land use mix – industrial plots for the identified sectors, social amenities, General infrastructure, specialized & specific infrastructure, road, open and green space etc.
- Develop requirements of various public utilities
- Provide an integrated infrastructure system network to support the development
- Compliance to various planning norms and guidelines of Bangladesh government

## **2.6 Project Infrastructure**

The CuEVL will be developed according to a comprehensive land-use framework following Bangladesh Economic Zones Act, 2010 and also the Bangladesh Bank guidelines on EZ. The proposed CuEVL project will have many components. Drawings of these components and implementation status of these components are presented in Annex A. Table 2.3 summarizes the infrastructure planning for CuEVL both On-site and Off-site.

**Table 2.3:** Description of the planned infrastructure in the CuEZL project area

<b>Components</b>	<b>Description</b>
<b>Site Grading</b>	The site is low char land, and thus major land filling would be required. It is desirable to fill land upto the level of Meghna Homna road which has been built above flood level. For that estimated average land filling required would be 15 Feet. Zone authority plans to land fill the site by acquiring sand from the River.
<b>Boundary Wall</b>	The boundary of the economic zone has been proposed to be marked with a wall of 9 feet high and on top of it 3 feet high barbed wire. This has been proposed to comply with the requirements to receive license for custom bonded warehouse. The perimeter of the zone is approximately 6,821 Meter.
<b>Roads</b>	<p>The road network of CuEZL has been planned maintaining the BEZA building code to provide best possible access to the inhabitants using different modes of transport. The different types of roads planned are as follows:</p> <p>There would be two types of road inside the zone. The major road from the entry gates to the other side of the zone would 50 Feet wide, which would also have 7 Feet wide Footpath on the both side of the road and 3.5 Feet wide median in the middle. These roads would also have 12 Feet wide green strip on both side along the foot path. These roads would spread in North South direction (Vertical to the Meghna Homna road)</p> <p>The second type of road would be 25 feet wide along with 5 feet wide foot path and 5 Feet wide green strip on both side of the road. These would be connecting roads and spread East-West direction along the zone.</p>
<b>Roads-pedestrian walkways</b>	Highest priority has been provided in suggesting paths for pedestrian. Since the employees are going to move within the zone mostly on foot, it is essential that they have safe passage. Walkways have been designed aesthetically along with green environment on either side of the roads.
<b>Over bridge</b>	Since a public road went across the two parts of the zone, it is essential that a communication network be developed which would not have to use that road on a regular basis. It would be required for both security and safety reasons and for time savings as well. A foot over bridge has been planned to connect between the two blocks. The employees would use this bridge to move from one block to the other without going through the public road.
<b>Surface Drainage</b>	<p>The drainage system has been planned to cater for the entire EZ through gravity flow. Drains are proposed to be on both sides of the roads.</p> <p>The rain water/surface water will be dispersed in the River in five different points. Two points are near the bridge over the river channel that runs through the zone. The other three points would be on the East side of the zone to the river. This would enable the drainage system to utilize the natural slope of the area and disperse the water through gravitational force.</p> <p>The network would be built using conduit pipe.</p>
<b>Water Supply/Storage</b>	<p>The zone is on the bank of a river branch, therefore in case of emergency the zone can utilize water from the river. Apart from that there is a canal inside the zone which would be retained and modified to be utilized as a water reservoir.</p> <p>An artificial water body would be created inside Block B that would act as emergency water reservoir and increase the aesthetic beauty of the zone.</p> <p>The zone would use both ground and surface water. Five deep tube wells would be setup to extract water from underground. Apart from that Three Water Treatment Plants will be setup to treat and store surface water and use it in the</p>

<b>Components</b>	<b>Description</b>
	zone. A 0.5-million-liter overhead storage tank is included in the Meghna Glass Factory. Other industries may also have their own water storage.
<b>Rain Water Harvesting</b>	The zone authority would keep provision for rain water harvesting. The canal would be used to store the water from this system. Investors will be guided to incorporate rain water harvesting system in the factory and other buildings. The contract with the investor would contain mandatory provision for rain water harvesting.
<b>Fire Fighting network</b>	The zone would have its own fire station for emergency situation. The zone would be equipped with fire hydrant network. Assessing the area coverage of the zone 109 fire hydrant pillars need to be installed. There would be a pump to supply water to those hydrants through a network of pipe line. The firefighting network would use water directly from the river as well as the water body created in the middle of the primary road.
<b>Sewerage and Effluent Network</b>	The sewerage system is planned to cater for the anticipated land use distribution. Wastewater generated from toilets is considered as sewage and wastewater generated from bath/ shower, laundry, hand basin and kitchen is considered as sullage (grey water). It is suggested that two separate networks, namely, sewerage network and effluent collection network will be installed by CuEZL. It is presumed that each industry will treat their effluent into wastewater standards prior to discharge into effluent collection network to be transported to the CETP. Sewerage network will be established by the project implementation authority considering the topography of the site. The network is divided into trunk main and sub mains according to the natural topography and other site constraints. Sewage will be collected and transported to the STP for treatment.
<b>Sewage Treatment Plant (STP) Considerations</b>	Sewage treatment is the process of removing contaminants from wastewater, comprising of storm run-off, domestic sewage and primary treated effluent. It includes physico-chemical and biological processes to remove various contaminants. Sewage would be managed through sewerage network system and STP.
<b>Central Effluent Treatment Plant (CETP)</b>	The zone would establish CETP for treatment of industrial effluent. Individual industries would have to treat their effluent to some extent to meet the intake requirements of the CETP. The treated effluent from the plants would then be sent to the CETP for further treatment. The CETP may employ chemical, biological and/or electro coagulation to effectively treat the industrial effluent. The zone authority would charge individual industries based on the volume treated. The zone authority has plans to establish three CETPs as the demand increases to cater to the needs of the investors. It should be noted that Pharmaceutical industries usually require special chemical effluent treatment processes, therefore, CuEZL should enforce such entities to ensure proper operation of CETP.
<b>Power Supply System</b>	The System parameters are as follows: Transmission Line-33 kV Number of Phases – 3 System frequency – 50 Hz Consumer Supply Voltage- 33kV/11 kV/240 volt Distribution substation is proposed in strategic locations. There would be one substation for the connection with the national grid.

Components	Description
	<p>There would be four secondary substations that would be used to supply electricity to the consumers (i.e., industrial units).</p> <p>Power can be distributed by a network of overhead lines or underground cables. The primary source of electricity would be one captive natural gas fired power plant with capacity of 100 MW consisting of multiple internal combustion engine-based generators, that will be phased in progressively. The connection from the national grid will be taken as a partial support source to meet the additional need and for emergencies. If there is unutilized electricity from the power plant than it would be supplied to the national grid. The 100 MW power consumption would not occur at the beginning, it will reach step by step in phase with the commissioning of the industries in the zone.</p>
<b>Street lighting</b>	<p>All the roads and streets would be provided with street lighting. This would serve the dual purpose of Assisting pedestrians and traffic and increasing safety and security.</p> <p>It is suggested to use solar street lighting in some areas to utilize renewable energy and reduce usage of electricity. Solar street light is suggested at a ratio of 2:1.</p>
<b>Telecommunication</b>	<p>All telecommunication services are expected to be provided through the concerned authority BTCL and the private mobile operators. The CuEZR authority would establish its own exchange to provide landline based telecommunication services to the users inside the zone.</p>
<b>Data connectivity</b>	<p>The users of the zone would require data connectivity for information exchange and communication. The zone authority would facilitate by providing internet access through the fiber optic network available in the area.</p>
<b>Landscaping</b>	<p>This includes works associated with the landscaping within the EZ covering tree strips along the boundary, roads, public greenery etc. Sufficient land Area will be used for landscaping and Aesthetic beautification of the project area.</p>
<b>Specialized infrastructure</b>	<p>It is also envisaged to provide the specialized infrastructure within EZ catering to the specific requirements of the occupant units.</p> <p>This would include:</p>
	<ul style="list-style-type: none"> <li>• Training center</li> <li>• Residential buildings (Dormitory, Guest house etc.)</li> <li>• Security offices</li> <li>• Administrative building,</li> <li>• Commercial building</li> <li>• Club</li> <li>• Daycare center</li> <li>• Place for worship</li> <li>• Medical center</li> <li>• Car parking hub</li> <li>• Playground and park</li> <li>• Lawn</li> </ul>
<b>River Protection</b>	<p>The zone is located on the bank of a river. Land filling has been done to raise the land above the 50 year flood level. To protect the site from river erosion, river bank protection would be required. It is planned to build river bank protection along the west boundary of the zone.</p>

## 2.7 Project Activities

### 2.7.1 Pre-construction Activities

The land filling work for the economic zone has already been completed. Therefore, pre-construction activities (activities related to site preparation) are mostly performed.

## **2.7.2 Project Activities during Planned Construction Phase**

The major activities being carried out during construction phase of the proposed project include the following:

- (1) Mobilization of personnel, material and equipment (including establishment of project office and labor shed, etc.)
- (2) Sand filling up to the Meghna-Homna road level has been completed by using dredged sand.
- (3) Conducting topographical survey for leveling of the filled land.
- (4) Providing layout of each plots and ancillary facilities based on the Master plan.
- (5) Ground preparation according to the topographical survey.
- (6) Construction of Administrative buildings of the CuEVL
- (7) Construction of the industrial buildings on the rental plots.
- (8) Construction of the back-up power plant, central effluent treatment plant, water treatment plant, central wastewater treatment plant.
- (9) Construction of the surface drainage system.
- (10) Construction of separate liquid effluent and wastewater collection network.
- (11) Construction of water storage and distribution network.
- (12) Construction of internal road network.
- (13) Installation of the electro-mechanical equipment including fire-fighting system.
- (14) Construction of a TSDF (**Treatment, Storage, and Disposal Facility**)for solid waste management.
- (15) Interior design including furniture and furnishing works;
- (16) Security system, traffic and pedestrian management system;
- (17) Landscaping/tree plantation, etc.

At present, construction of administrative building, Meghna Re-Rolling and Steel Mills and Meghna Glass Industry of CuEVL is going on. Construction of sub-station, internal road network is nearly complete. Construction of other industrial facility and their operational activities are yet to start.

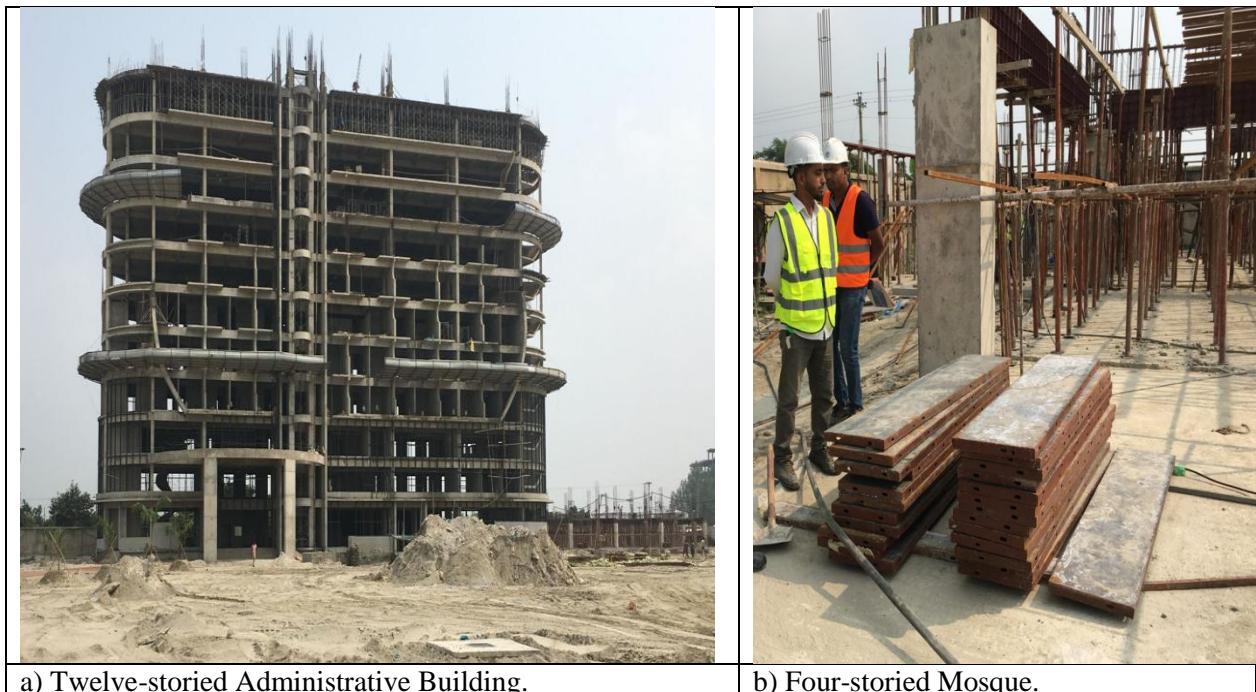
## **2.7.3 Project Activities during Planned Operational Phase**

The major activities during operational phase include:

- (1) Regular operation and maintenance of Industries owned by CuEVL
- (2) Regular operation and maintenance of Industries on rented plots;
- (3) Operation and maintenance of the Central Effluent Treatment Plant;
- (4) Operation and maintenance of the Central Sewage Treatment Plant;
- (5) Operation and maintenance of the Central Water Treatment Plant;
- (6) Solid waste management;
- (7) Operation and maintenance of the Back-up Power Plant;
- (8) Internal traffic management; and
- (9) Security Operation.

## 2.7.4 Present Project Scenarios

The BRTC, BUET team visited the CuEZL project site on 12 October, 2023 and observed that construction work of three projects owned by CuEZL namely, Administrative Building, Meghna Re-Rolling Still Mills Ltd. and Meghna Glass Industry Ltd., are going on full swing. Neither of these projects are in operational stage nor any leased industry has set up its factory in the economic zone. The construction works of 12-storied Administrative Building and the 4-storied mosque at the south side of Administrative Building are going on (Figure 2.4). Of which, construction work of the Administrative Building is 70% complete.



**Figure 2.4:** Construction of 12 Storied Administrative Building and adjacent Mosque

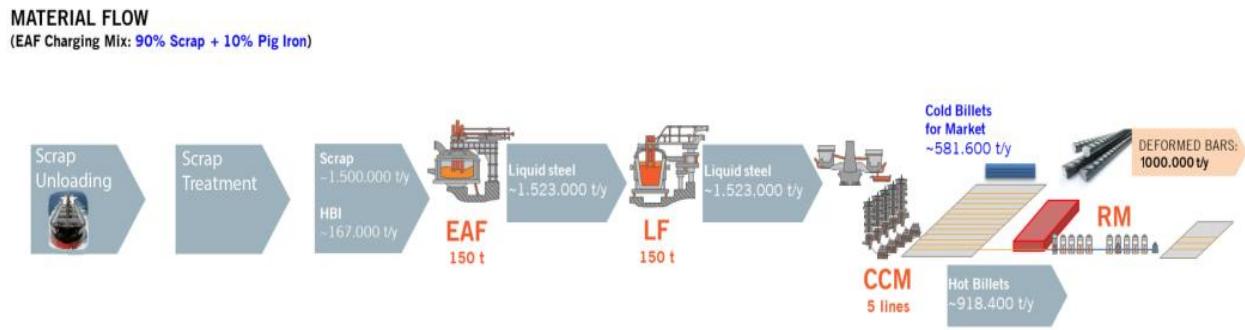
### Meghna Re-Rolling and Steel Mills Ltd.

Meghna Re-Rolling and Steel Mills Ltd. is located at the south west corner of Block A (northern part of the project area) of CuEZL area (Figure 2.5). The layout plan and BEZA Approval letter for this industry is presented in Annex A and Annex P, respectively. The production capacity of this steel mill is 1.5 MMT per year. A total of 90-acre area is allocated for Warehouse, Scrap Processing Yard, Melting Furnace (EAF), Continuous Casting Machine (CCM), Re-Heating

Furnace and Rolling Mill (RM), 230 kV Sub-station (to be installed by Meghna Re-rolling & Steel Mills Ltd. on its own) WTP, Melt Shop Plant (MSP), Fume Treatment plant (FTP) and Greenery. Among these components, construction of steel structure warehouse is complete and Rolling Mill's foundation work is going on. The flow chart of Meghna Re-Rolling and Steel Mill is shown in Figure 2.6.



**Figure 2.5:** Meghna Re-Rolling Still Mills Ltd. of CuEZL



**Figure 2.6:** Flow chart of Meghna Re-Rolling and Steel Mills Ltd.

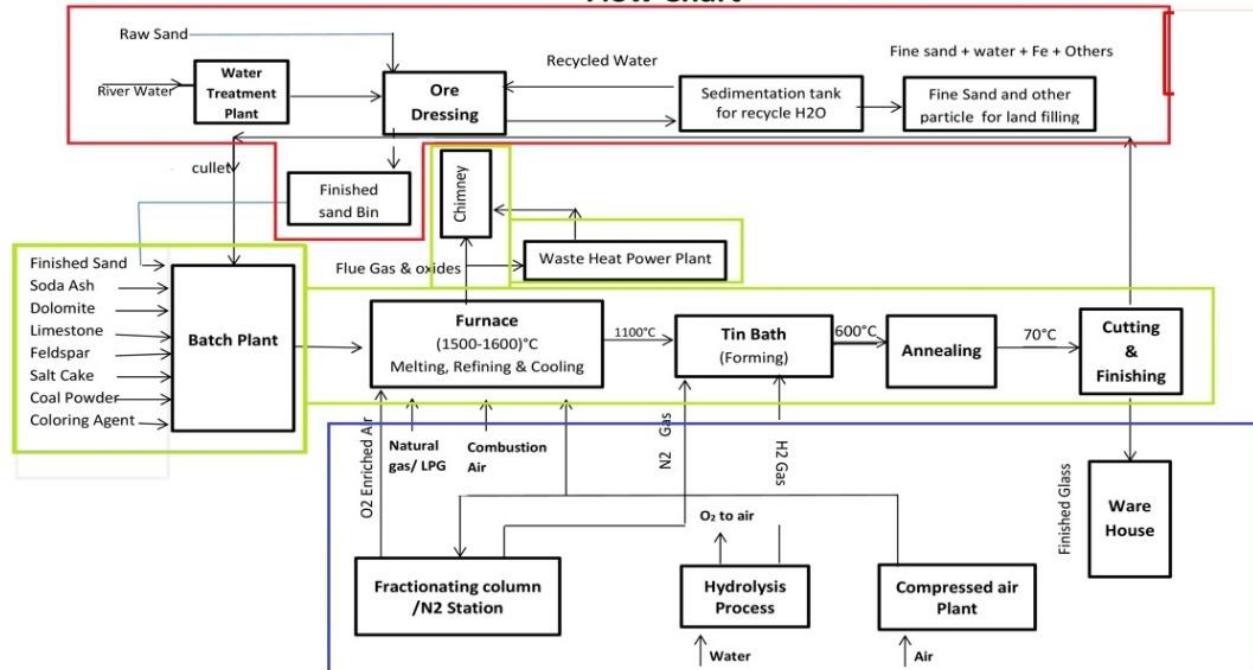
A WTP will be built at this site to treat the river water for cooling process. The proposed WTP for this Steel Industry and FMT are presented in Annex T. The internal road works within the project area are going on. The CuEZL has a future plan to set up a 100 MW Gas based power plant at this site to produce electricity.

#### **Meghna Glass Industries Ltd.**

Meghna Glass Industries Ltd. is located at Block B (south part of the project area) of Cumilla Economic Zone. The layout plan and BEZA Approval Letter for this industry have been provided in Annex A and Annex P, respectively. The total area for this project is around 85 acres. This site is comprised of a number of buildings/sheds to cater the process. The flow chart of this industry is shown in Figure 2.7.

## Meghna Glass Industries Ltd.

### Flow Chart



**Figure 2.7:** Flow Chart of Meghna Glass Industries Ltd.



a) Meghna Glass Industries Limited.

b) 90 meter Chimney of the Glass Industry.



**Figure 2.8:** Meghna Glass Industries Ltd.

The construction of Finished Good Warehouse and Cutting Section and 90m height three-layer Chimney (Figure 2.8) are complete. The outer layer of the chimney is made of concrete, middle layer is glass wool and inner layer is made of insulation block. The inner diameter of chimney at Flue Inlet is 5.67m and at the top is 3.1m. Flue temperature exiting from the furnace will be around 430 degree centigrade. The flue gas then will be charged through a Waste Heat Boiler and will be sent to Chimney. Temperature of the flue after the waste heat boiler will be around 160 degree centigrade.

The construction of Batch Plant (11 storied Steel structure), Furnace, Turbine house, Conveyer belt, etc. are going on. Here, two types of glass will be produced – regular glass and clear glass. For the production of regular glass, Hobiganj Silica sand will be used and for clear glass imported silica from Egypt will be used. The roads within this project site is rigid pavement as flexible pavement (bituminous road) may interfere with the quality of glass. Around 8.5 km of

road out of 15 km has already been constructed. The main storm drainage system (3 ft - 5 ft dia RCC pipes) in this site has also been completed.

A workers' dormitory of 1000-person capacity will be built within the area of this industry. An overhead water tank of 5.0 lac litre capacity will be built as an emergency source to supply water to the furnace. An Ansar Security Barrack and Firefighting Truck Stand (5 nos. capacity) will also be in this project area.

CuEZL is expecting to complete the construction work of the above stated projects by the year 2024. The construction audit of these three projects have been provided in Annex F.

## **2.8 Project Cost**

The total cost for the CuEZL project has been estimated as BDT. 822,796,721/- approximately. The summary of the estimated cost for the development of CuEZL and the cost to be incurred in future are shown in Table 2.4 and Table 2.5.

**Table 2.4:** Estimated Cost for the Infrastructure Development of CuEVL

S.L.	Cost Item	Estimated Cost (Tk)	S.L.	Cost Item	Estimated Cost (Tk)
	<b>Land &amp; Land Development</b>				
1	Land	1,231,200,000	30	Concrete Batching Plant-1	8,820,000
2	Land development (Earth Filling)	1,155,211,200	31	Concrete Batching Plant-2	8,550,000
	<b>Sub Total</b>	<b>2,386,411,200</b>	32	Welding Machine	525,000
	<b>Building &amp; Civil Construction</b>		33	Hydraulic rotary pile machine	74,340,000
3	Boundary Wall	110,550,000	34	Forklift	5,090,000
4	Internal Road Cost	470,448,000	35	Tower Hoist	1,500,000
5	Building (Administrative & Others)	2,040,095,200	36	Generator	1,400,000
6	Custom Office Building	12,500,000	37	Plate Compactor	320,000
7	Gate & Gate House Cost	100,000,000	38	Import Expense	13,114,350
8	Drainage Cost	104,000,000	39	Erection & Installation	5,245,740
9	Sewerage line Cost/Stp	260,000,000		<b>Sub Total</b>	<b>280,647,090</b>
10	Green Zone Cost	230,400,000		<b>Vehicle, Furniture &amp; Fixtures</b>	
11	CETP Cost	512,000,000	40	Furniture	10,315,789
12	Water Reservoir Cost	146,881,677	41	Computer	1,375,000
13	Electrical Street Lighting Cost	53,900,000	42	Printer	400,000
14	Transformer & Substation Cost	383,400,000	43	Air Conditioner	8,400,000
15	Electricity Connectivity Cost	45,000,000	44	Scanner	500,000
16	Fire Station	75,667,765	45	Fax Machine	200,000
17	Security Shed & Guard Room	40,000,000	46	Telephone	3,000,000
18	Central Mosque	89,100,000	47	Other Equipment	5,000,000
19	Park & Lake (Estimated)	21,000,000	48	Motor Vehicles	20,000,000
20	Medical Care	17,500,000		<b>Sub Total</b>	<b>49,190,789</b>
21	Gas Connectivity Cost	665,000,000		<b>Deferred Expenses</b>	
	<b>Sub Total</b>	<b>5,377,442,642</b>	49	Consultancy Fees, Company Formation Cost Etc.	60,000,000
	<b>Machinery</b>			<b>Sub Total</b>	<b>60,000,000</b>
22	Crane	44,100,000		<b>Pre-operating Expense</b>	
23	Pay Loader/Wheel loader	17,850,000		<b>Sub Total</b>	<b>1,605,000</b>
24	Excavator	13,440,000	50	License And Application Fee	1,605,000
25	Roller compactor	9,240,000	51	Secretarial Cost	2,000,000
26	Drum Truck	17,640,000	52	Expenses For Site Clearance	500,000
27	RMC Transit Mixture	44,352,000	53	Miscellaneous Cost	70,000,000
28	Mixture Machine	5,040,000		<b>Sub Total</b>	<b>74,105,000</b>
29	Concrete Pump	10,080,000		<b>Grand Total</b>	<b>8,227,796,721</b>

**Table 2.5:** Project Cost vs Cost incurred and to be incurred for CuEZL

Components of CAPEX	Total Project Cost			Total Cost Incurred as on August 31, 2023	Total Cost To be Incurred	Percentage of Completion as on August 31, 2023	Amount BDT in Million
	Debt	Equity	Total	Total	Total		
Land	-	1231.20	1231.20	1231.20	-	100%	
Land Development	-	1155.21	1155.21	1155.21	-	100%	
Building & Civil Construction	5077.80	299.65	5377.44	1820.55	3556.90	34%	
Imported Machinery	-	280.65	280.65	222.00	58.65	79%	
Vehicles, Furniture & Fixtures	-	49.19	49.19	26.55	22.65	54%	
Consultancy Fee & Contingency	-	60.00	60.00	60.00	-	100%	
Pre-operating Expense	-	74.11	74.11	43.90	30.21	59%	
<b>Project Cost (without IDCP)</b>	<b>5077.80</b>	<b>3150.00</b>	<b>8227.80</b>	<b>4559.40</b>	<b>3668.39</b>		

## Chapter 3

### **POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK**

#### **3.1 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 key tenets of the various applicable policies are incorporated in the WBG Performance Standards (PSs), their applicability are provided in Annex C.

#### **3.2 Relevant National Laws and Regulations**

##### ***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 Tilla” 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***

In order to protect the environment and reduce pollution, Bangladesh Ministry of Environment, Forest and Climate Change (MoEFCC) issued Environmental Conservation Rule 2023 in March 2023 and thus repealed the previous rule ECR, 1997. In ECR, 2023, industrial units and projects are classified into four categories --- green, yellow, orange and red – based on their activities and level of pollution. The green category denotes a lower impact on the environment; yellow denotes a medium impact on the environment; orange denotes those that have a harmful effect on the environment and human health, and red denotes those in industries that have severe impacts on the environment and human health, which must be reduced to maintain a healthy and safe environment.

The Environmental Conservation Rules (2023) set (i) the National Environmental Quality Standards for ambient air, various types of water, industrial effluent, emission, noise, 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. ECR (2023)provides the Director General of Department of Environment (DoE) a discretionary authority to grant ‘Environmental Clearance’ to an applicant under certain conditions. The environmental clearance process for green, yellow and orange category industry and red category industry, as described in MoEFCC circular and BEZA Standard Operating Procedures are presented in Figure 3.1 and Figure 3.2 respectively. Environment Conservation Rules (2023) ensures the right of any aggrieved party to appeal against the notice order or decision to the appellate authority.

Bangladesh Environmental Quality Standards for air, water, wastewater, odour and noise etc. are presented in Annex C.



**Figure 3.1: Process of application for environmental clearance for Green, Orange and Yellow industries (ECR, 2023)**

## ENVIRONMENTAL APPROVAL PROCEDURE FOR EZ UNIT INVESTORS OF RED CATEGORY PROJECTS

### Online Application for TOR Approval by DoE through OSS

Required documents for Online Application:

- General Information/ Project Profile
- Approval of Investment Registration from BEZA
- Location Map and Layout Plan
- Details of the Production Process with Flow Diagram
- Land Lease Agreement or Land Ownership Document
- Draft TOR

### Site Inspection by DoE alongside with BEZA

### Forwarding of Application for TOR Approval to the DoE

### Approval of TOR by DoE

**Development of  
Temporary works (e.g.  
Labor Shed, Storage  
for Construction  
Material, Temporary  
Road etc.)**

Conducting EIA Study based on Approved TOR  
and data from EIA of EZ

Online Application for EIA Approval with the  
following Documents to the OSS:

- I. EIA Report prepared according to the  
approved TOR
- II. NOC from relevant government authority
- III. ECC Application Fee + 15% VAT
- IV. Feasibility Study

Forwarding of the Application for EIA  
Approval to the DoE via Online

Offline submission of EIA Report to Relevant  
Field Office

Issuance of EIA Approval by DoE

Issuance of Investment Clearance by BEZA

**Final Construction of  
the Project**

### Online Application for ECC to DoE

### Project Inspection by DoE alongside with BEZA

### Issuance of the ECC by DoE

### Beginning of Operation Phase

Environmental Clearance Renewal after each one-year period

**Figure 3.2: Process of application for environmental clearance for Red category industries  
(ECR, 2023)**

**Air Pollution Control Rules, 2022**

Bangladesh Ministry of Environment, Forest and Climate Change (MoEFCC) published Air Pollution Control Rules (2022) on July 2022. This rule is established under the Bangladesh Environment Conservation Act (BECA, 1995) and sets the National Air Quality Control Plan and the Air Pollution Prevention Plan, identifying air pollution activities and establishes standards for ambient air quality, emission standards for vehicles, emission standards from industries (power generation, textiles, cement, fertilizers etc.), and odor standards (Annex C). The rules also provide for the prevention of air pollution from hazardous wastes, air quality monitoring and warning, data management, establishment of a national executive committee for air pollution control, measures to prevent damage to ecosystems caused by air pollution, awards for contributions to air pollution control and penalties for violation.

**National Land-use Policy, 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 opening 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”.

### **3.3 Policies, Act and Regulations related to Economic Zones**

#### **3.3.1 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)***

Establishment of Economic Zone: 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 an 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 guideline 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. Details of the Bangladesh Private Economic Zones Policy, 2015 is given in Annex C.

### ***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 be prepared 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.

**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**

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. Mandates individual ETPs for every industry.

**BEZA Standard Operating Procedure for Services and Clearance relating to Fire Extinction (2020)**

States procedures for Approval of Fire Fighting Floor Plan (NOC), Effectiveness Certificate in favor of Fire safety arrangement and Fire License in Economic Zones.

### **3.4 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).

## **3.5 International Conventions**

### **3.5.1 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\\_DI\\_SPLAY\\_BY,P10011\\_CONVENTION\\_TYPE\\_CODE:1,F](https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:10011::NO:10011:P10011_DI_SPLAY_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.

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#### ***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 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 comprise:

- 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.

### **3.6 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 and Climate Change (MoEFCC) 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 (1997) 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

### **3.7 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.

#### **3.7.1 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 3.1.

**Table 3.1:** List of the Performance Standards on Environmental and Social Sustainability and their Applicability in the CuEZL project

<b>Performance Standard</b>	<b>Description</b>	<b>Triggered/ Applicable</b>
Performance Standard 1 (PS1)	Assessment and Management of Environmental and Social Risks and Impacts	Yes
Performance Standard 2 (PS2)	Labor and working conditions	Yes
Performance Standard 3 (PS3)	Resource Efficiency and Pollution Prevention	Yes
Performance	Community Health and Safety	Yes

<b>Performance Standard</b>	<b>Description</b>	<b>Triggered/Applicable</b>
Standard 4 (PS4)		
Performance Standard 5 (PS5)	Land Acquisition and Involuntary Resettlement	Yes
Performance Standard 6 (PS6)	Biodiversity Conservation and Sustainable Management of Living Natural Resources	Yes
Performance Standard 7 (PS7)	Indigenous Peoples	No
Performance Standard 8 (PS8)	Cultural Heritage	Yes (May be)

### **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 CuEZL authority received the land from Meghna Group of Industries (MGI). As a result, no land acquisition and involuntary resettlement are necessary for this project. However, the land has been purchased by MGI from local people, it is pertinent to ensure conformity to the guidelines for purchasing process. Henceforth, the PS5 is 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 eco-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. In many cases, their economic, social, and legal status limits their capacity to defend their rights to, and interests in, lands and natural and cultural resources, and may restrict their ability to participate in and benefit from development. 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*

Though there are several sites of historical and archeological importance including shalvan Vihara, Kutila Mura, Charandra Mura, Rupban Mura, Itakhola Mura, Satera Ratna Mura, Ranir Banglar Pahar, Ananda Bazar Palaces, Palaces of Bhoj King, Chandi Mura, none of the sites are

within 300 m of the project site. However, earthwork and excavation n during the construction phases of the industries in the project areas might expose buried Physical Cultural Resources (PCR). Subsequently, PS8 may be applicable to the proposed CuEZL project.

The triggered WBG Performance Standards to the CuEZL project is summarized in Table C.2-1 in Annex C.

The national legal instruments relevant to the project is also summarized in Table C.3-1 in Annex C.

## **Chapter 4**

### **BASELINE ENVIRONMENT, POTENTIAL IMPACTS AND AUDITING OF CONSTRUCTION WORKS**

#### **4.1 Introduction**

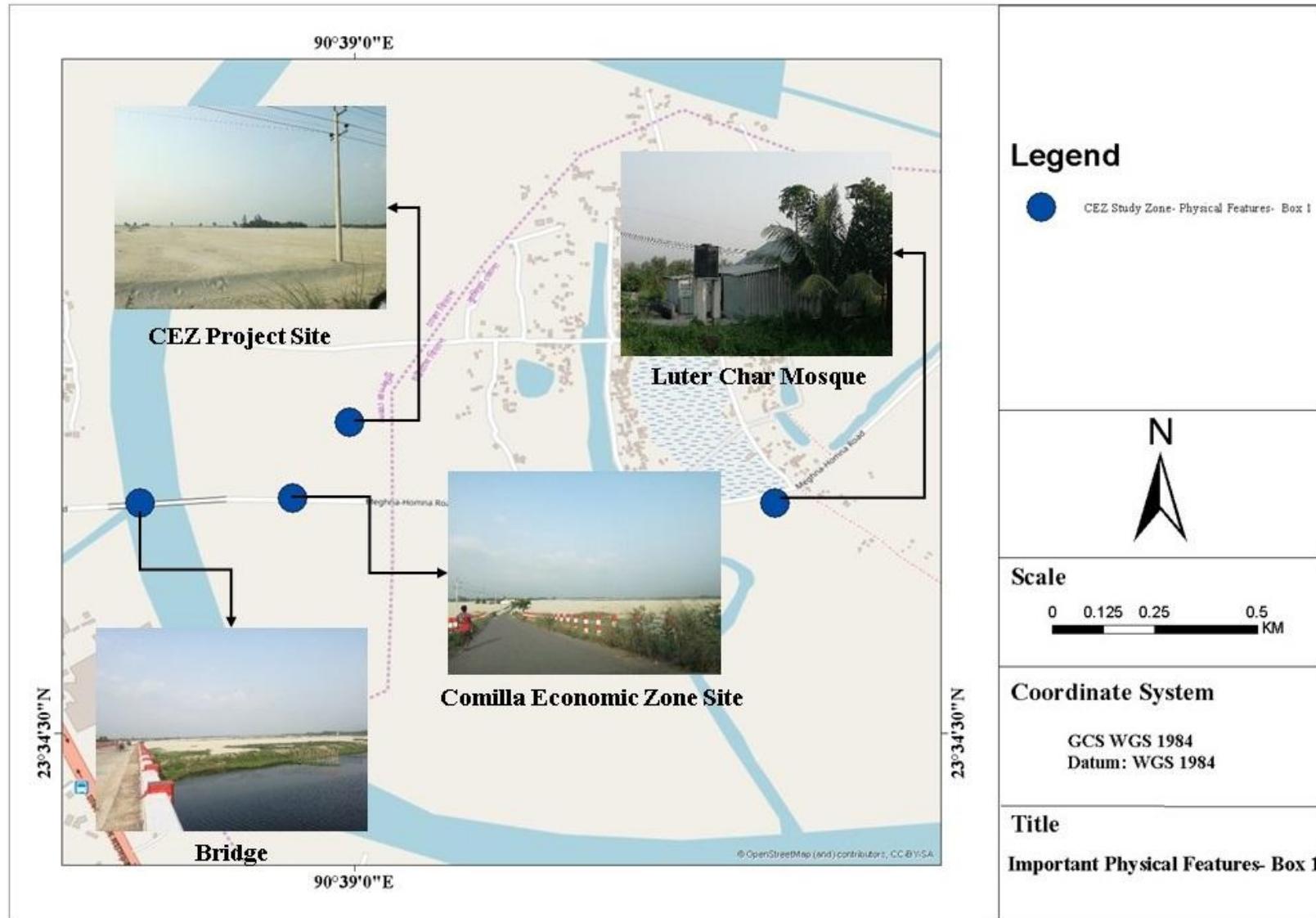
As a part of the environmental assessment of the proposed “Cumilla Economic Zone Limited” project (CuEZL), an environmental baseline surveys were carried out in areas surrounding the proposed location May 2019 as well as in August 2022. The specific objectives of the baseline study were:

- 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.

#### **4.2 Physical Environment**

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. 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 4.1 shows some important physical features of the proposed project site. Detailed description of the physical features of the study area is given in Annex B.



**Figure 4.1:** Some important physical features of the proposed project site

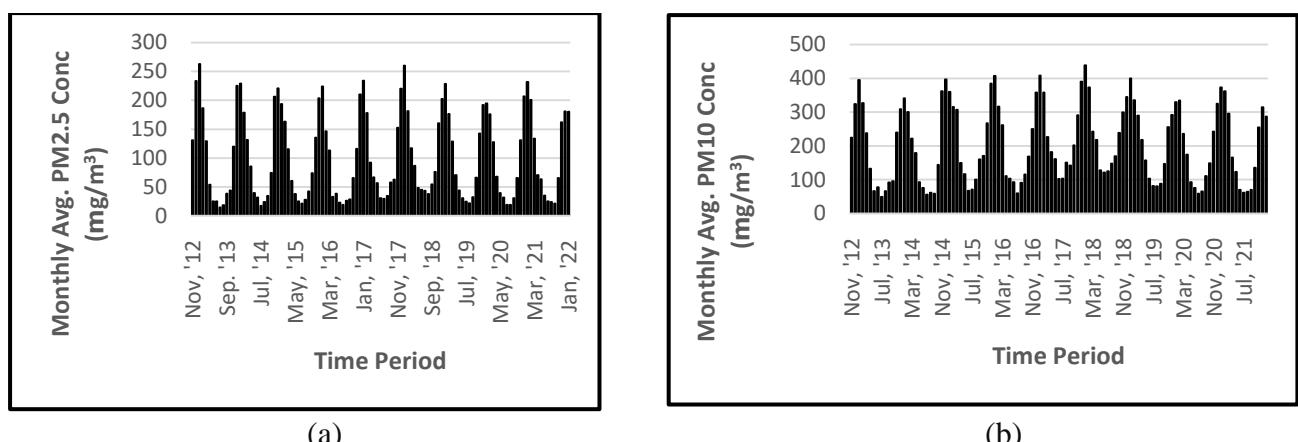
## 4.3 Physico-Chemical Environment

### 4.3.1 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 4.1). The detailed air quality data over the last 10 years are given in Appendix B. Figure 4.2 provides the PM<sub>10</sub> and PM<sub>2.5</sub> measured monthly in these CAMS-5 station which are compared with the Bangladesh Ambient Air Quality Standards and WHO Ambient Air Quality Guidelines.

**Table 4.1:** 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	23.63°N	90.51°E	PM10, PM2.5, SO <sub>2</sub> , NO, NO <sub>2</sub> , NO <sub>x</sub> , CO, and O <sub>3</sub> with meteorological parameters.



**Figure 4.2:** Monthly (a) PM<sub>2.5</sub> and (b) PM<sub>10</sub> monitoring data from the CAMS-5 located at Narayanganj for the monthly period of year 2012 and 2022

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<sub>2.5</sub> and PM<sub>10</sub> 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<sub>2.5</sub> and PM<sub>10</sub> with brick kilns. NO<sub>x</sub> 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.

### 4.3.2 Climate: Season, Solar Radiation, Precipitation, Relative Humidity and Temperature

In Bangladesh, 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 varies 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.

### ***Solar Radiation***

Solar radiation directly affects air quality contributory pollutants and their dispersion through the area. Annex B contains figures showing CAMS-5 average monthly solar radiation data of year 2012 to 2021.

### ***Precipitation***

Annex B contains CAMS-5 average monthly rainfall data of year 2012 to 2021 near the study area. The general pattern of precipitation includes drier months of November to March, increasing rains in April and May, and highest rainfall in the summer months of September and October.

### ***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%.

### ***Ambient Air Temperature***

In general, cool seasons coincide with the period of lowest rainfall in the country. Maximum average temperature over the year is usually observed in March - September and minimum average temperature in January.

### **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). 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 Proposed site falls under Brahmaputra Alluvium soil tract. 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.

To assess the heavy metal contents of the natural soil in the study area soil samples were collected from the site for the proposed Project site CuEZL site (150-200m from Meghna Upazilla road bridge) from about 0.15 m below the top of the original soil layer, one from near the construction site and one from near the gate using a split spoon. 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 4.2. It can be seen that the heavy metal contents of soil are within usual limits of such metals found in natural soil.

**Table 4.2:** Heavy metal content of the soil from the proposed project site

Parameters	Unit	Concentration Present				Typical content in natural soil <sup>a</sup>
		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	--

<sup>a</sup>USEPA Office of Solid Waste and Emergency Response, Hazardous WasteLand Treatment, SW-874 (April 1983, Page 273)

### ***Seismicity***

The whole of Bangladesh is divided into three seismic zones. The project site is located in Zone-II which includes the greater districts of Dinajpur, Bogra, Dhaka and Chittagong where the shocks of intensity of VIII are possible.

#### **4.3.4 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. About 75% of Bangladesh is less than 10m above sea level and 80% is flood plain susceptible to flood. Flooding normally occurs during the monsoon season from June to September. The convectional rainfall of the monsoon adds to the ice-melt waters of the Himalayas. A flood risk map around the project site is given in Annex B.

##### ***Earthquake***

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, which implies that earthquakes of moderate intensities are expected here.

##### ***Cyclone and Tidal Surge***

A cyclone risk map, prepared by the Management Information and Monitoring (MIM) Division of the Disaster Management Bureau (DMB) in 2001, distinguishes between the risk zones of no

risk, wind risk, low risk and high risk. The proposed project site does not fall under cyclone risk zone or high wind area.

#### 4.3.5 Water Quality

In order to assess the groundwater quality, two representative groundwater sample and one surface water sample were collected from the study area in September 2022. Details of the samples are presented in Table 4.3.

**Table 4.3:** Details of the water samples

Sample Type	Sample Description	Sample ID	Location	
			Longitude	Latitude
Ground water	CuEZL site office Tubewell (21/09/2022)	GW	90°38'44.00"E	23°34'48.94"N
	Naya Kanda, Luterchar (21/09/2022)	GW	90°39'50.22"E	23°35'03.10"N
Surface Water	Meghna Channel (Branch) near Meghna Upazila road Bridge (21/09/2022)	SW	90°39'24.81"E	23°34'20.09"N

#### *Groundwater quality*

Groundwater samples were tested for selected water quality parameters in BUET environmental engineering laboratory. Table 4.4 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 4.4:** 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 2023)
		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 <sub>3</sub>	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 <sup>-</sup>	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

Water Quality Parameters	Unit	GW Concentrations Present			WHO Guide line values 2004	Bangladesh Standard for Drinking
		Inside Gate	Construction Site	Outside Boundary		
Electrical Conductivity, EC	µS/cm	725	675	655	-	-

MDL = Minimum Detection Limit

### **Surface water quality**

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 4.5. 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 4.5:** Analysis of surface water sample collected from Meghna River Branch 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 <sup>h</sup>	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, BOD <sub>5</sub>	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 <sup>g</sup> (0.01)	< MDL <sup>g</sup> (0.01)	< MDL <sup>g</sup> (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

#### **4.3.6 Groundwater Table**

The groundwater level in Bangladesh 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 groundwater map shows that water is available at the project site around 5.3-7.8 m below the ground surface (Annex B).

#### **4.3.7 Ambient Noise Level**

As a part of the baseline study, noise level measurements were made at different locations 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 4.6 shows the summary of noise level measurements carried out in different locations in and around the study area. Table 4.6 shows that noise levels at different locations were low because being a rural area and having low activity.

**Table 4.6:** 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.]

## **4.4 Baseline Ecology**

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). Potential impacts for the proposed CuEZL project activities have been identified, evaluated and described with suggested mitigation measures and management and monitoring plans.

### **4.4.1 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.

The ecologist of the EIA team visited the proposed CuEZL project site and adjacent areas in September 2022 to collect first hand 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.

### **4.4.2 Ecological perspective of CuEZL Project Site and Adjacent Areas**

The proposed site was a lowland which was sand-filled modifying the permanent, seasonal and/or temporary habitat of the fauna compelling them to leave the prosed CuEZL area due to destruction, scarcity of food and other living subsistence. A few number of terrestrial flora still exist in scattered way within the proposed CuEZL project site 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.

Meghna River and its tributary are the prime habitats for fish and aquatic fauna. Fishermen catch the Hilsha -*Tenualosa ilisha* fish along with other fish species from the Meghna River and its tributaries, and all of these fishes have commercial value. A 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 consumed by certain type of fauna. Some pictures of flora and fauna are given below in Figure 4.3. Details of the flora and fauna are given in the Annex B.



(a)



(b)



(c)



(d)

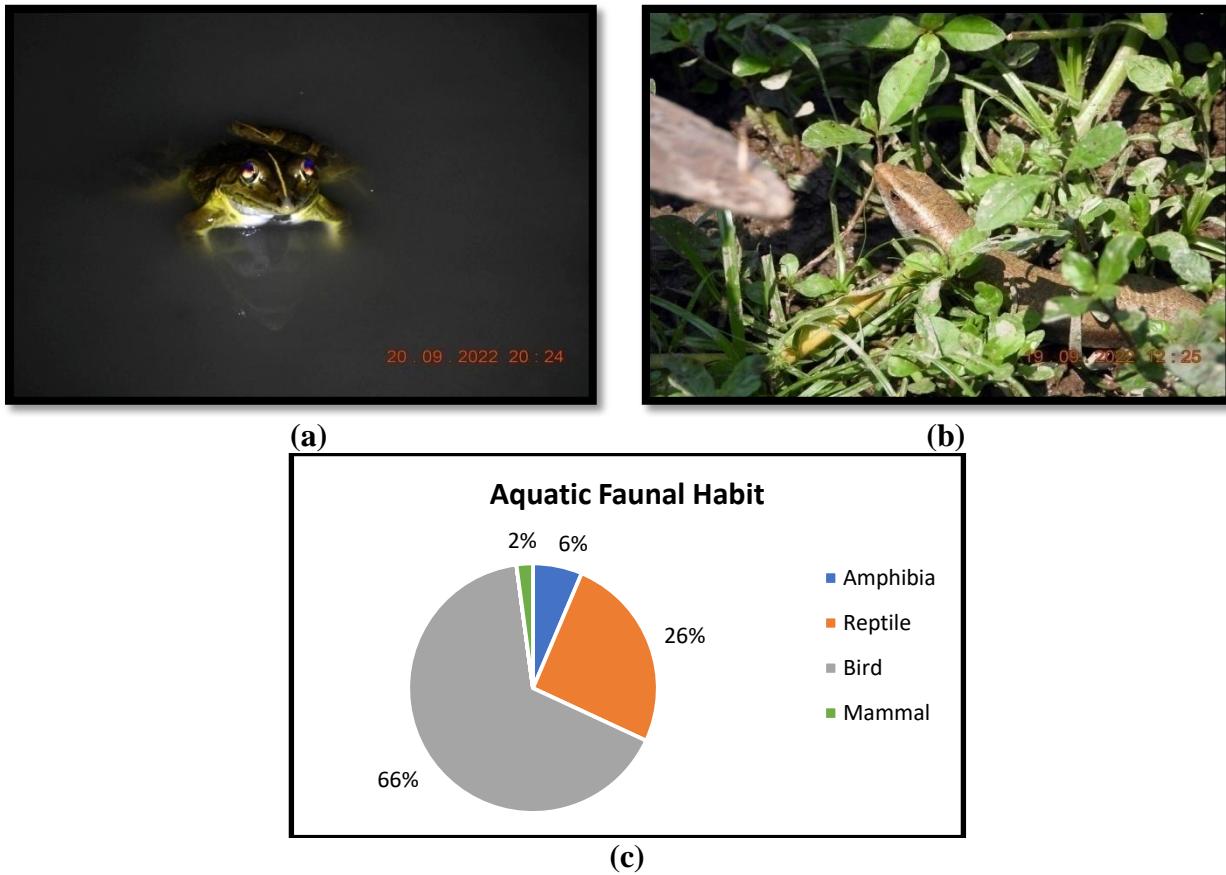
**Figure 4.3:** Example of flora and fauna observed within and adjacent to the proposed CuEZR project site

#### 4.4.3 Faunal Diversity

Diversified faunal species exist within and outside areas of the proposed CuEZR project site. On the basis of habitats, the faunal species found within and adjacent to the proposed CuEZR 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:

**Aquatic Fauna:** Aquatic habitat dependent faunal species are the main components of aquatic fauna, which includes amphibian, reptilian, avian, and mammalian species. 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 CuEZR project site and its adjacent areas, and two-third of them fall under aquatic avian category. A few identified aquatic faunal species are shown in Figure 4.4. A partial list of identified aquatic faunal species with their abundance, distribution and status (national and international) are given in Tables 4.7 and 4.8. Details of the same are given in Annex B.



**Figure 4.4:** Aquatic fauna observed, adjacent to the proposed CuEZR project site (a) and (b); Distribution of aquatic faunal habit (%) in areas within and adjacent to the proposed CuEZR project site.

**Table 4.7:** List of Identified Aquatic Amphibian Species that exist in areas within and adjacent to the CuEZL project site

#.	Name		Habit	Abundance			Status												Distribution				
				O	P	L	Bangladesh			R	E	E	C	E	V	N	L	D	N	C			
	English	Scientific		R	I	C	V	C	R	E	X	W	R	N	U	T	C	D	E	T	1	2	
1	Asian Bull Frog	<i>Hoplobatrachus tigrinus</i>	A	Y	Y	Y	N	Y	N	N	N	N	N	N	N	Y	N	N	Y	LC	N	Y	
2	Skipper Frog	<i>Euphlyctis cyanophlyctis</i>	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	<i>Hylarana tytleri</i>	A	N	N	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y

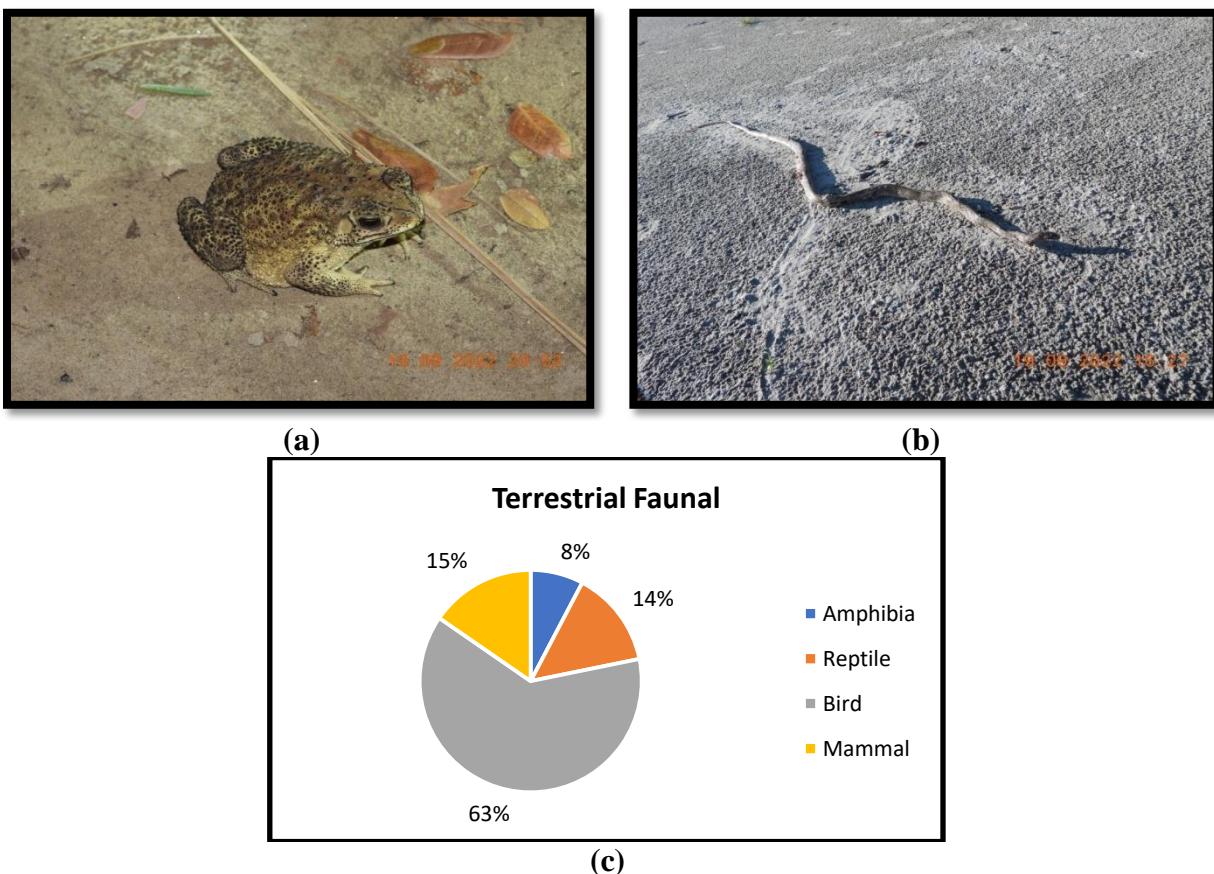
**Note:** A = Aquatic, O = Observed, PR = Previous Record, LI = Local Information, Y =Yes, N = No, VC = Very Common, C = Common, R = Rare, RE = Regionally Extinct, EX = Extinct, EW = Extinct in the Wild, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern,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

**Table 4.8:** List of Identified Aquatic Reptilian Species that exist in areas within and adjacent to the CuEZL project site

S. N.	Name		Habit	Abundance			Status												Distribution				
				O	P	L	Bangladesh			R	E	E	C	E	V	N	L	D	N	C			
	English	Scientific		R	I	C	V	C	R	E	X	W	R	N	U	T	C	D	E	T	1	2	
1	Brown Softshell Turtle	<i>Nilssonia hurum</i>	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	<i>Aspideretes gangeticus</i>	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	<i>Pangshura smithii</i>	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	<i>Pangshura tecta</i>	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	<i>Lissemys punctata</i>	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	<i>Eutropis macularia</i>	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	<i>Eutropis carinata</i>	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	<i>Enhydris enhydris</i>	A	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
9	Checkered Keelback	<i>Xenochrophis piscator</i>	A	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	NE	N	Y
10	Striped Keelback	<i>Amphiesma stolatum</i>	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	<i>Xenochrophis cerasogaster</i>	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	<i>Gerarda prevostiana</i>	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.

**Terrestrial Fauna:** Several species of amphibia, reptile, bird and mammal are the main components of the terrestrial fauna. 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 CuEVL project site and adjacent areas, and almost two-third of them falls under terrestrial avian category. A few identified terrestrial faunal species are shown in Figure 4.5, which indicates that the project study site is moderately rich with the terrestrial avian species. A partial list of identified terrestrial faunal species with their abundance, distribution and status (national and international) are given in Tables 4.9 and Table 4.10. Annex B contains the complete list.



**Figure 4.5:** Terrestrial fauna observed, within and adjacent to the proposed CuEVL project site (a) and (b); Distribution of terrestrial faunal habit (%) in areas within and adjacent to the proposed CuEVL project site (c).

**Table 4.9:** List of Identified Terrestrial Amphibian Species that exist in areas within and adjacent to the CuEZL project site

S. N.	Name English	Scientific	Habit	Abundance			Status												Distribution				
				O	P R	L I	Bangladesh			Global													
							V C	C	R	R E	E X	E W	C R	E N	V U	N T	L C	D D	N E	C T	1	2	
1	Asian Common Toad	<i>Duttaphrynus melanostictus</i>	T	Y	Y	Y	Y	N	N	N	N	N	N	N	N	Y	N	N	N	LC	Y	Y	
2	Asian Cricket Frog	<i>Fejervarya limnocharis</i>	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	<i>Polypedates leucomystax</i>	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	<i>Polypedates maculatus</i>	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	<i>Fejervarya pierrei</i>	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	<i>Hylarana taipingensis</i>	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 4.10:** List of Identified Terrestrial Reptilian Species that exist in areas within and adjacent to the CuEZL project site

S. N.	Name English	Scientific	Habit	Abundance			Status												Distribution				
				O	P R	L I	Bangladesh			Global													
							V C	C	R	R E	E X	E W	C R	E N	V U	N T	L C	D D	N E	C T	1	2	
1	Bengal Monitor Lizard	<i>Varanus bengalensis</i>	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	Y	N	N	N	N	LC	N	Y
2	Banded Krait	<i>Bungarus fasciatus</i>	T	N	Y	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
3	Binocellate Cobra	<i>Naja naja</i>	T	Y	Y	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	NE	Y	Y
4	Common Garden Lizard	<i>Calotes versicolor</i>	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	<i>Hemidactylus flaviviridis</i>	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	<i>Hemidactylus frenatus</i>	T	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	LC	N	Y
7	Common Krait	<i>Bungarus caeruleus</i>	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	<i>Ptyas mucosa</i>	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	<i>Ahaetulla prasina</i>	T	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	NE	N	Y
10	Tokay Gecko	<i>Gekko gecko</i>	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	<i>Varanus salvator</i>	T	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.

## Fish Diversity

Diversified fish species exist in various types of wetlands near the proposed CuEZL project site. Freshwater habitats exist in the tributary of the Meghna River, canal, pond, wetland, etc., which are an important nursery ground for native fish species. 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 Annex B.



(a)



(b)



(c)



(d)

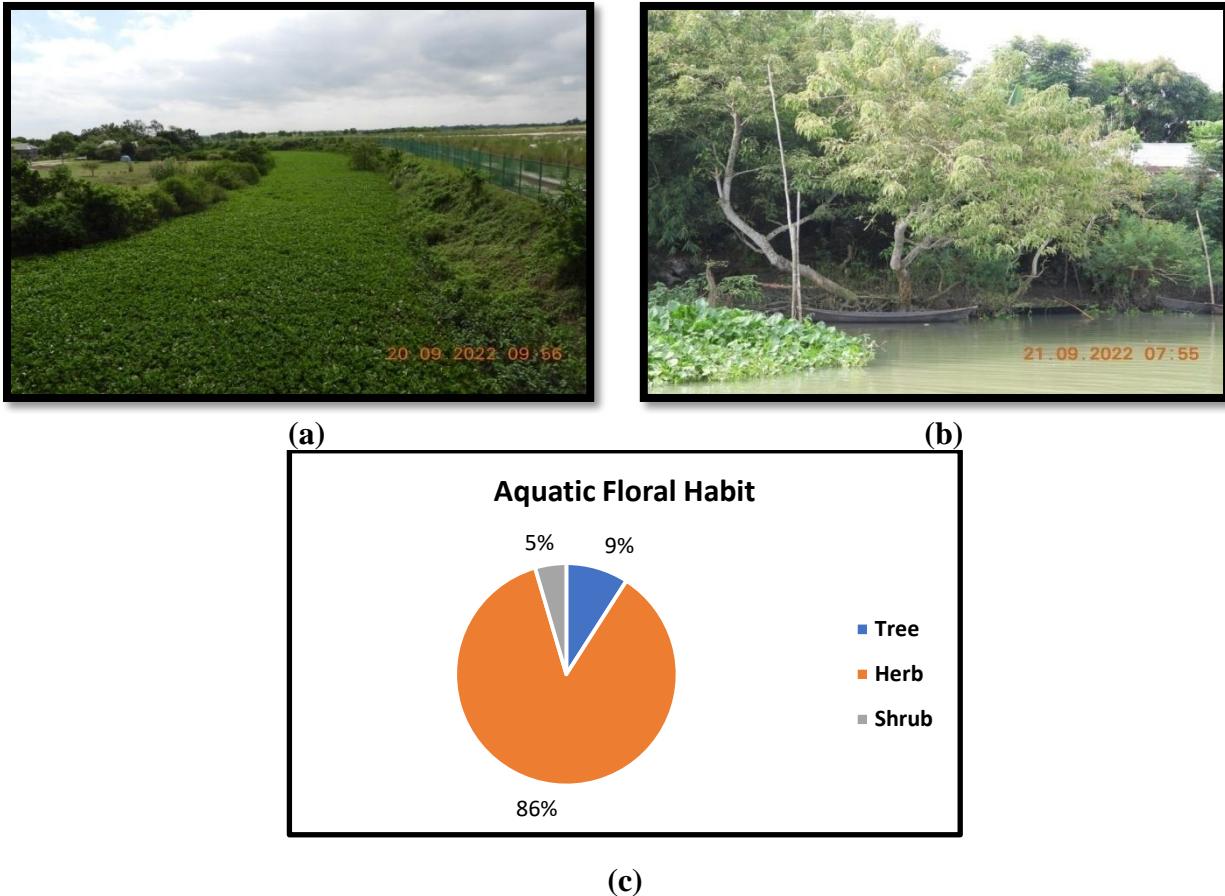
**Figure 4.6:** Fish fauna observed, adjacent to proposed CuEZL project site.

### 4.4.4 Floral Diversity

Various types of flora exist within and adjacent to the proposed CuEZL project site, and these play a vital role to maintain the balance of existing eco-environment. 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.

**Aquatic Flora:** 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 suitable for aquatic habitat. 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 4.7, which indicates that the area is moderately rich with aquatic herb-floral diversity. A partial list of identified aquatic floral species with their abundance, distribution and status (national and international) are given in Table 4.11 and a complete list is provided in Annex B.



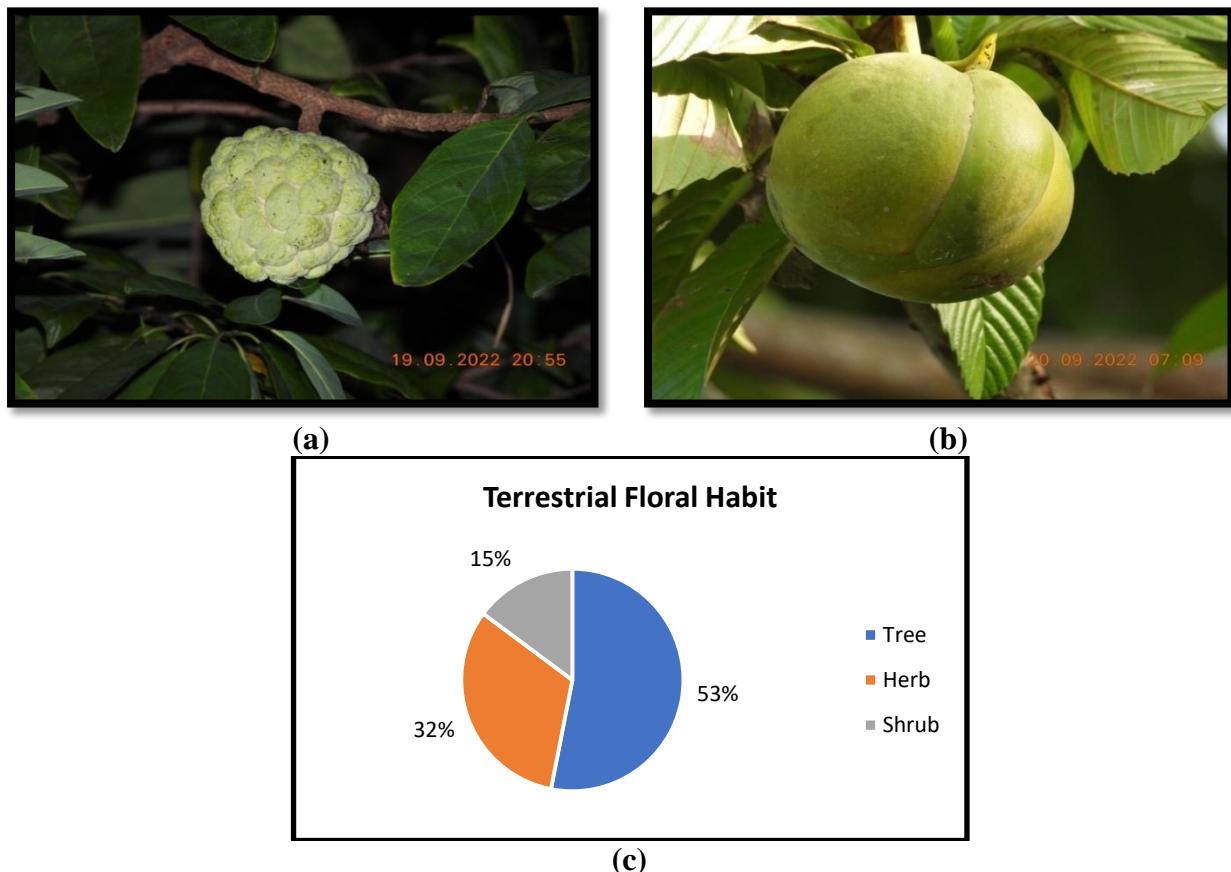
**Figure 4.7:** Aquatic flora observed, adjacent to the proposed CuEZL project site: (a) & (b) and Distribution of aquatic floral habit (%) in areas within and adjacent to the proposed CuEZL project site (c).

**Table 4.11:** 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	P R	L I	Abundance			Status				Distribution					
	Family	Native	Scientific					VC	C	R	Bangladesh				1	2				
											T	NT	U	CT						
1	Amaranthaceae	Helencha	<i>Alternanthera philoxeroides</i>	H	Y	Y	Y	Y	N	N	N	N	Y	N	Y	N	Y			
		Haicha	<i>Alternanthera sessilis</i>	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y			
2	Aponogetonaceae	Ghenuhu	<i>Aponogeton natans</i>	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y			
3	Araceae	Topapana	<i>Pistia strateotes</i>	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y			
		Katchu	<i>Colocasia esculenta</i>	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y			
4	Capparaceae	Barun	<i>Crateva nurvala</i>	T	Y	Y	Y	N	N	Y	N	N	Y	N	Y	N	Y			
5	Compositae	Helencha	<i>Enhydra fluctuans</i>	H	N	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y			
6	Convolvulaceae	Kalmi	<i>Ipomoea aquatic</i>	S	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y			
7	Gramineae	Nolkhagra	<i>Arundo donax</i>	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y			
		Janglidhan	<i>Hygroryza aristata</i>	H	N	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y			
8	Hydrocharitaceae	Patajhangi	<i>Vallisneria spiralis</i>	H	N	Y	N	N	Y	N	N	N	Y	N	Y	N	Y			
		Janjhi	<i>Hydrilla verticillata</i>	H	N	Y	N	N	Y	N	N	N	Y	N	Y	N	Y			
	Lecythidaceae	Hijal	<i>Barringtonia acutangula</i>	T	N	Y	N	N	N	Y	N	N	Y	N	Y	N	Y			
9	Limnaceae	Khudipana	<i>Lemna perpusilla</i>	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y			
	Nymphaeaceae	Shapla	<i>Nymphaea nouchali</i>	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y			
10	Menyanthaceae	Chandmala	<i>Nymphaoides indica</i>	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y			
11	Marsileaceae	Shushni	<i>Marsilea quadrifolia</i>	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y			
12	Onagraceae	Keshordam	<i>Ludwigia adscendens</i>	H	Y	Y	Y	N	Y	N	N	N	Y	N	Y	N	Y			
13	Pontederiaceae	Kachuripana	<i>Eichhornia crassipes</i>	H	Y	Y	Y	Y	N	N	N	N	Y	N	Y	N	Y			
		Boronukha	<i>Monochoria hastata</i>	H	Y	Y	Y	Y	N	N	N	N	Y	N	Y	N	Y			
		2 Sarkachu	<i>Monochoria vaginalis</i>	H	Y	Y	Y	Y	N	N	N	N	Y	N	Y	N	Y			
14	Salviniaceae	Indurkanipana	<i>Salvinia cuculata</i>	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.

**Terrestrial Flora:** 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. 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 4.8, 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 Annex B.



**Figure 4.8:** Terrestrial flora observed, within and adjacent to the proposed CuEZL project site: (a) and (b); and Distribution of terrestrial floral habit (%) in areas within and adjacent to the proposed CuEZL project site (c).

#### 4.5 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 4.12). 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 Annex B.

## **4.6 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. 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)”. 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.

**Table 4.12:** 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	<i>Varanus bengalensis</i>	T	N	N	N	N	N	N	Y	N	N	N	N	LC	N	Y
		Yellow Monitor Lizard	<i>Varanus salvator</i>	T	N	N	N	N	N	N	Y	N	N	N	N	LC	N	Y
2	Mammalia	Ganges River Dolphin	<i>Platanistagangetica</i>	A	N	N	N	N	N	Y	N	N	N	N	N	EN	N	Y
3 (freshwater fish)	Asiatic Snakehead	<i>Channa orientalis</i>	A	N	N	N	N	N	N	Y	N	N	N	N	N	LC	N	Y
	Freshwater Shark	<i>Wallago attu</i>	A	N	N	N	N	N	N	Y	N	N	N	N	N	LC	N	Y
	Gangetic Goonch	<i>Bagarius bagarius</i>	A	N	N	N	Y	N	N	N	N	N	N	N	N	LC	N	Y
	Garua Bacha	<i>Clarias garua</i>	A	N	N	N	N	Y	N	N	N	N	N	N	N	LC	N	Y
	Gangetic Mudeel	<i>Monopterus cuchia</i>	A	N	N	N	N	N	N	Y	N	N	N	N	N	LC	N	Y
	Great Snakehead	<i>Channa marulius</i>	A	N	N	N	N	Y	N	N	N	N	N	N	N	LC	N	Y
	Grey Featerback	<i>Notopterus notopterus</i>	A	N	N	N	N	N	N	Y	N	N	N	N	N	LC	N	Y
	Humped Featherback	<i>Chitala chitala</i>	A	N	N	N	N	Y	N	N	N	N	N	N	N	LC	N	Y
	Indian Mottled Eel	<i>Anguilla bengalensis</i>	A	N	N	N	N	N	Y	N	N	N	N	N	N	LC	N	Y
	Long-whiskered Catfish	<i>Sperata aor</i>	A	N	N	N	N	N	N	Y	N	N	N	N	N	LC	N	Y
	Rita	<i>Rita rita</i>	A	N	N	N	N	Y	N	N	N	N	N	N	N	LC	N	Y
	Pabda Catfish	<i>Ompok pabda</i>	A	N	N	N	N	Y	N	N	N	N	N	N	N	LC	N	Y
	Scribbled Goby	<i>Awaous grammepomus</i>	A	N	N	N	N	N	Y	N	N	N	N	N	N	LC	N	Y
	Ticto / Firefin Barb	<i>Pethia ticto</i>	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..

## **4.7 Social Baseline**

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 with the objectives of gathering information on the existing socio-economic aspects which exist within and adjacent areas of the proposed CuEZL project site.

### **4.7.1 Approach and Methodology**

The socio-economic field study covered an area of 10 km radius from 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 CuEZL project site have been described below in brief and the detailed discussion is provided in Annex B.

### **4.7.2 Socio-Economic Perspective of the CuEZL Project Site and Adjacent Areas**

**General Aspects of the Proposed Project Site:** The proposed site has been sand-filled and has already been separated from the locality through newly built concrete boundary wall, thus, movement of local people through this land is restricted. It was known from the MGI that the land for the CuEZL project has already been purchased from the private sources with full payment. 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. exist in the project site. A large industrial structure is currently under construction beside the Meghna-Homna road (for glass industry), 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 construction and other associated works are ongoing. A few activities within the project site are shown in Figure 4.9.



**Figure 4.9:** 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) industrial structure under construction

**Project adjacent areas:** All villages around the site are bounded by planted floras that have economic value. Most villages have fertile soil for growing short rotation crops and vegetables. Wood and Tin shed house are common in the villages beside some concrete buildings.

The tributaries of Meghna River exist with plenty of aquatic resources, and local fishermen practice fishing there throughout the year. Local community catch fishes from those seasonal wetlands. Few ponds also exist in the villages, and people prefer to culture freshwater dependent fishes there. The villagers rear cattle, poultry, pigeon, etc. inside the villages. Various types of crops like piper, onion, okra, etc. are cultivated within the villages. 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 is 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 are not far away from the proposed CuEZL project adjacent areas. A few numbers of religious and educational institutions exist. A detailed description of these are given in Annex B and a few pictures depict the activities around the project adjacent areas (Figure 4.10).



(a)



(b)



(c)



(d)



(e)



(f)

**Figure 4.10:** Socio-economic aspects observed in the adjacent areas of proposed CuEVL project site.

#### 4.7.3 Findings from Socio-economic Questionnaire Survey

A socio-economic questionnaire survey was carried out by the social surveyors (Figure 4.11) 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 CuEVL project at their locality. The sample of questionnaire sheet has been provided in Annex B. 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)

**Figure 4.11:** Social surveyors filling out the questionnaire sheets by interviewing local people for the proposed ‘Cumilla Economic Zone Limited’ project.

#### 4.7.4 Socio-economic Aspects

All respondents for questionnaire survey were male; this is primarily due to the unavailability, unwillingness of female gender since in the rural areas they generally tend to stay inside the house and are generally unwilling to talk to outsiders. One third of all respondents' (33%) age was more than 55 years. All respondents were Muslims. Almost half of all respondents (44%) have primary level education, followed by secondary level education (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.

More than half of all respondents (54%) represent run small business followed by farming (23%). Economic condition of the respondents appears to be poor compared to other areas of Bangladesh. More than half of the respondents (54%) have monthly income in between Taka ten thousand to twenty thousand followed by Taka twenty thousand to thirty thousand (10%).

#### ***Resource Efficiency and Pollution Prevention and Management (PS 3)***

All respondents have access to use of electricity at their houses and other commercial activities. Most respondents (87%) have no access to use of piped gas supply for cooking, and primarily use firewood (74%). Almost all respondents (95%) have no access to piped water supply system. They use tube-well, pond and river water. There is no sewer system. Most respondents (82%) opined that the area is not an arsenic contaminated area. On the other hand, iron contamination is almost non-existent according to almost all respondents (97%). 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.

#### ***Community Health and Safety (PS 4)***

Almost all respondents (92%) had no accident/injury record in the last six months. 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 months; mainly suffered from fever (70%). They 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.

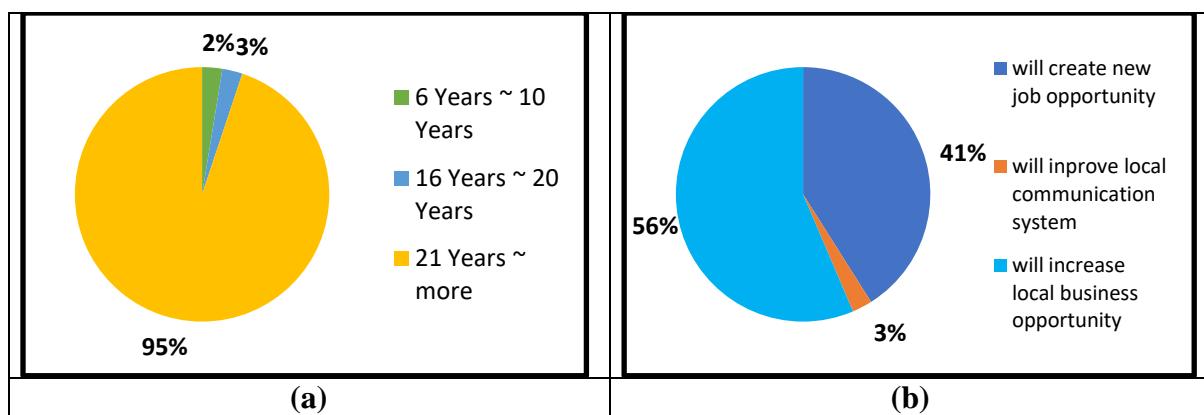
The CuEZR authority has put in place its own security system entrusted with the responsibility of providing safety and security to its personnel inside the Economic Zone. It is likely that untoward incidents will occur between the security guards and the villagers. However, none of

the respondents alleged any such untoward incident. They are not aware of any complaint management mechanism to address the conflict if it occurs.

#### ***Land Acquisition, Restrictions on Land and Involuntary Resettlement (PS 5)***

Almost all respondents (95%) have been living in the area more than 21 years. 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 the land purchasing process has already been completed by the MGI and subsequently handed over to CuEZL Authority; hence, land related impact to the local community will be low as it has already been settled.

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/ name of industries to be established at their locality. More than three-fourth of all respondents (77%) knew that the private land will be purchased for the proposed project. Almost half of the respondents (44%) have already handed over their lands to the MGI for CuEZL project following ‘Willing Buyer-Seller Approach’. Most of these people (88%) had already received their selling price as agreed upon by both the parties (buyer-seller). A few respondents (15%) had to relocate following selling their land. It should be noted that there were no permanent houses and or residential set up in the project area. Almost two-third of the respondents (64%) opined that proposed CuEZL project site was used as agricultural land before sand-filled by MGI, while others (36%) opined that some of CuEZL land was also fallow land. Before sand-filling, few respondents (18%) occasionally 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 (Figure 4.12)



**Figure 4.12:** Length of residency and 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

## ***Biodiversity Conservation and Sustainable Management of Living Natural Resources (PS 6)***

Local environment has already been changed badly due to land filling as well as removal 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 population, 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, 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.

## ***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.

## ***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.

## **4.8 Environmental Impacts**

### **4.8.1 Methodology**

An environmental impact is defined as any change to an existing condition of the environment. Identification of potential impacts has been done on the basis of baseline data collected from primary and secondary sources, and potential processes that would be carried out during the project life-cycle. Details of baseline environmental and social conditions have been provided in Annex B. The potential impacts have also been identified based on experts' opinions and inputs received from public consultation events. The impacts can be broadly classified as those taking place during pre-construction, construction and operational stages. The impacts of environmental components that are identified in this chapter include physicochemical environmental impacts, ecological impacts, and socio-economic impacts. Potential impacts associated with the proposed development are identified from various project activities including site preparation, equipment use, materials use, construction of infrastructure, and industrial operation processes. Impacts on main receptors including environmental, ecological, and social aspects are evaluated to assess the degree of effects from various identified impact categories.

An evaluation of the impacts of project activities on the physico-chemical, ecological and socio-economic parameters, both during construction and operation phases of the project has been carried out for the proposed CuEZL project. For convenience, the impacts have been categorized

as “positive impact”, “no impact”, and “negative impact”. The intensity of positive and negative impacts has been classified (qualitatively) into “low”, “medium” and “high” categories. Short-term (S) and long-term (L) nature of impacts have also been identified.

Major physicochemical parameters considered for assessment of environmental impacts of project activities during construction phase include water pollution, drainage congestion, noise pollution, air pollution, and generation and disposal of solid wastes.

#### **4.8.2 Impacts during Pre-Construction Phase (Site preparation)**

The project area was a low-lying char land before the development of the project. Therefore, land use pattern has been changed due to the development of an economic zone in this area and landscape has been altered due to the intervention.

The previously low-lying land area acted as storage area for rainwater and often flood water in case of excessive rainfall. As the site is low land, major land filling has been performed for the site preparation. It was filled up to the level of Meghna-Homna road which has been built above flood level. For that estimated average land filling required was 15 Feet. Zone authority filled up the site by acquiring sand by dredging from the nearby river branch. Subsequently, the storage capability of the area is lost or reduced, which may increase the possibility of flooding in the surrounding community. As the land area of CuEVL project is a part of flood plain, it was part of the natural drainage in the project area, especially in the monsoon season. Due to filling up of the land, the natural drainage pattern in the area will be altered. Thus, the surrounding community may face water-logging problem if adequate measure is not taken to provide alternate drainage path for the surface runoff towards nearby river and other surface water bodies.

Most of these fill materials are collected from Meghna River through dredging. The dredged materials, primarily containing sand, from the riverbed are usually transported in fluidized form after mixing with water. The runoff water from the dredged area could percolate through the filled materials, which eventually ended up in the river. High turbidity of this water likely affected the quality of the nearby surface water body. Such high turbid water poses threat to the aquatic life through obstruction of light penetration. It is also possible that, heavy metals and other contaminants that were deposited and accumulated into the sediment get released during the dredging process. If present, these released heavy metals may get mixed with the slurry water and re-enter into the surface water body. Eventually, the surrounding surface water-body may become contaminated with heavy metals. Dredging process may also alter bathymetry of the river, resulting in changes of velocities, flows, and erosion / accretion cycles. However, the baseline data of surface water (Meghna River branch water) does not show any such contamination of heavy metals.

#### **4.8.3 Impacts during Construction Phase**

##### *Impacts from Excavation*

The proposed CuEVL Project involves construction of a number of industrial buildings within the project area. Construction of high-rise building may require deep foundation. The deep foundation would be associated with excavation. In case of excavation with open cut method, there is possibility of soil collapse hampering the safety of the workers. This process may also require constant pumping of water out of the excavation trench to keep the trench workable.

Moreover, the excavation would generate a huge volume of earth material, which need to be properly disposed of.

#### *Impacts from Road Construction within the area*

Proposed CuEZR Project will construct internal roads within the area for transporting materials to and from the site and this will affect the topography and geology of the project area.

#### *Impacts from Wastewater and Solid Waste*

Waste and wastewater that would generate during the construction phase of the project include construction debris and wastes, and some other solid wastes (e.g., from labor sheds), human wastes from people working at the project site (e.g., from labor sheds), and some liquid waste from construction processes. These waste and wastewater could lead to pollution of water and general environment, if not properly disposed of.

##### *Wastewater*

Wastewater, in the form of human wastes, will be generated mainly in the temporary labor sheds. This could be a major source of pollution (including water pollution) if not properly managed. Use of unsanitary latrines and improper disposal of human waste would create environmental pollution and adversely affect human health at the construction site by increasing the risk of disease transmission. Proper disposal of wastewater should, therefore, be ensured as suggested in Chapter 7. There is also a risk of disease transmission from migrated workers coming from outside of the project area during construction stage.

There is a chance of sediment pollution due to the flows of construction wastewater to the nearby river, and canals. Moreover, oily water used in various works in construction phase may contaminate the surface water and soil within the project area.

##### *Solid Waste*

Construction debris and wastes to be generated during the construction phase would include scrap iron, steel, wooden frames, piping, and other solid wastes. Most of it will be generated toward the end of the construction phase during carrying out of the finishing works, while the site will be cleared of waste materials. The volume of such construction wastes is likely to be significant. Indiscriminate storage and disposal of construction debris and wastes could create local water logging and ponding by blocking drainage lines and would be aesthetically displeasing. Solid waste of domestic nature such as plastic, glass, paper, decomposable food wastes, would be generated in the temporary labour sheds at the construction site, and is not likely to be significant in volume. But indiscriminate disposal of such solid wastes would create environmental pollution and an unhealthy situation at the project site. Proper disposal of these solid wastes, as described in Chapter 7, is therefore necessary.

##### *Noise Pollution*

Noise pollution is likely to result from a wide range of construction activities at the project site, including the movement of vehicles carrying construction materials, equipment to and from the site, and different construction activities. The main sources of noise during construction period will be site preparation works, excavating, piling, transportation and handling of materials and equipment, other engineering works like riveting, hammering, cutting, welding, etc. Operation of concrete mixers, excavator, construction vehicles, fabrication, handling of equipment and materials, etc. would generate a considerable amount of noise. The noise levels of most of the construction machineries (80~95 dBA) are approximately 10 to 35 dBA higher than the base noise level (50~80dBA) in the project area. The noise from these activities and machine/equipment is likely to cause an increase in noise over the base noise level. This high

level of noise would have a significant impact on the population residing nearby. If construction of any industry is carried out when many others are in operation, the workers of the existing industries may also be affected by construction related noise pollution. Additional construction would further increase the effect of high noise level in those area. Proper mitigation measures have to be incorporated to reduce the impact of noise upon health.

Department of Environment (DoE) in Bangladesh does not provide any guideline for noise control in construction sites. So, standards as indicated in Noise Limits for Construction Sites (GB12523-90) and Standard of Noise at boundary of Industrial Enterprises (GB12348-90) may be applied for evaluation of noise pollution during construction period, and the said noise limits are listed in Table 4.13.

**Table 4.13: Noise Limits for Construction Sites (GB12523-90)**

Construction Phase	Leading Noise Source	Noise Limit, dB(A)	
		Daytime	Night time
Earthwork	Bulldozers, excavators, loaders, backhoes and etc.	75	55
Piling	Various piling machines	85	Construction prohibited
Structure engineering	Concrete mixers, vibrators, electric saws and etc.	70	55
Fit-out work	Cranes, lifters and etc.	65	55

Table 4.14 shows the typical noise levels generated by some of the construction equipment expected to be used during the construction phase. As seen from the table, the local peak noise level for non-continuous construction activity may reach as high as 90 dB(A), depending on the type of equipment.

The noise levels of the engineering machinery and vehicles used during the construction period are featured by their intermittent nature with mobility and high noise level (which is 80~90 dB(A) at a distance of 1 m). Through applying the attenuation of point source method (without taking into account of such attenuation by sound barriers or atmospheric absorptions), the geometric divergence of sound attenuation has been calculated using the following formula:

$$L_r = L_{r_0} - 20 \log(r/r_0) \quad (4.1)$$

Here,

$L_r$  = A-weighted sound pressure level in dB(A) at place  $r$  away from the noise source;

$L_{r_0}$  = A-weighted sound pressure level in dB(A) at place  $r_0$  away from the noise source;

$r$  = distance between the point of estimation and noise source (in meters); and

$r_0$  = distance between the reference point and noise source (in meters)



**Table 4.14: Noise Levels Generated by Construction Equipment (measured at 1m distance)**

Equipment	Noise Level (dB(A))
<b>Earth Movers</b>	
Front Loaders	72-84
Backhoes	72-93
Tractors	76-96
Scrapers, Graders	80-93
Pavers	86-88
Bull dozer	86-88
Excavator	84-86
Trucks	82-94
<b>Material Handlers</b>	
Concrete Mixers	75-88
Concrete Pumps	81-83
Cranes	75-86
Winch	85-88
<b>Stationary</b>	
Generators (in canopy)	71-82
Electric Saw	81-85
Wood Planer	81-85

Estimated noise levels at different distances from the noise source at the construction site are shown in Figure 4.13. It is seen from the figure that the noise level of typical construction machineries (85-90 dBA) drops to an acceptable limit (70 dBA) within 30 m from the source. However, at the locations of the noise sources (construction machinery/ activities), the noise level will increase over the base level noise at that location and the extent of increase is estimated as follows.

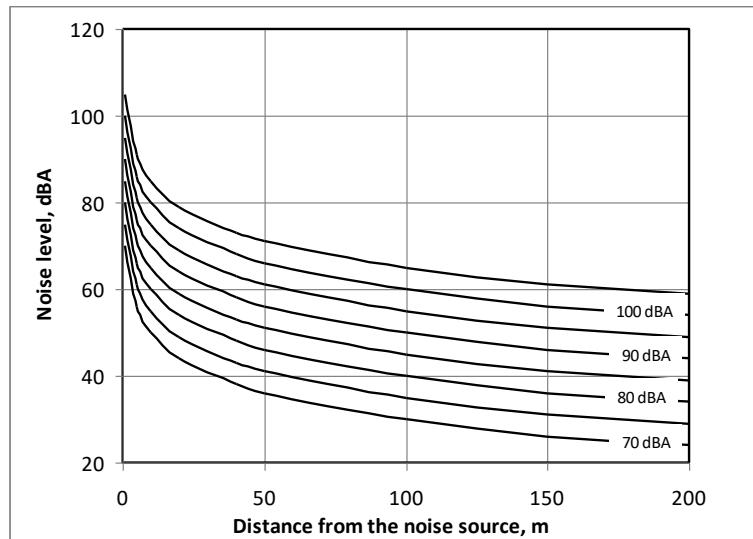
The cumulative or combined sound level due to  $n$  number of different sources is given by the following equation.

$$L_t = 10 \log \left( \sum_{i=1}^n 10^{L_i/10} \right) \quad (4.2)$$

Here,

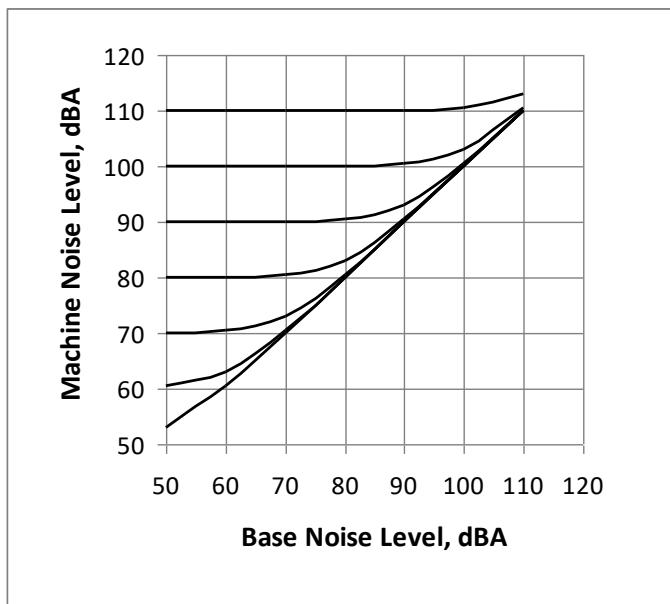
- $L_i$  = A-weighted sound pressure level in dB(A) of individual noise source; and  
 $L_t$  = Combined A-weighted sound pressure level in dB(A) of all noise sources;

The effect of a noise source as well as of simultaneous operation of more than one noise sources is shown in Figure 4.2. In reality, the noise level of most of the construction machineries (80~90 dBA) are on an average 35 dBA higher than the base noise level (50~80 dBA) and it is seen that in case of such a big difference in noise level the combined level is determined by the noise level of the machine. However, the impact of the machine-generated noise will subside within 30 m from the location of the machine.



**Figure 4.13:** Attenuation of noise level with distance from the source.

Table 4.14 demonstrates that noise levels of engineering machinery are high, and the place where noise at daytime exceeds those as indicated in Noise Limits for Construction Sites (GB12523-90) are within a radius of 30 m to the noise source. Such noise from project activities may cause discomfort to the people living/working in the surrounding areas at close proximity of the project site, especially if such activities are continued during the night. However, such noise impacts will be temporary in nature and will cease as soon as the construction work is over.



**Figure 4.14:** Combined noise level due to the operation of noise generating machines.

#### Air Pollution

Localized and temporary air pollution may generate from earthworks (e.g., excavation, filling) during site preparation, movement of vehicles, and operation of machines and equipment. During the construction phase of the proposed project, the important sources of emissions would include those from the operations of construction equipment and machineries, vehicles carrying construction materials to the site and taking construction debris out of the site. The air pollution generated from these activities is likely to be localized (affecting immediate surroundings of the emission source/ project site). If construction equipment, such as stone (aggregate) crusher, is used at the site, this may result in significant emission of particulate matter during its operation. Since construction of the proposed project may also involve earthworks, increase in particulate matter in the air from wind-blown dust is also a concern. Construction of roads within the project area with bituminous material may also result in gaseous and fugitive emissions. Mitigation measures as outlined in Chapter 7 should be adopted to minimize the possible adverse impacts of project activities on air quality.

#### Drainage Congestion

Since the construction phase involves significant earthwork (e.g., excavating/ back-filling for the foundation of the buildings) there are chances of stagnation and ponding of storm water if care is not taken for proper drainage of storm water. Additional drainage congestion may result from possible obstruction to the natural flow of drainage water due to construction activities as well as storage of construction materials.

As discussed earlier, natural drainage pattern of the project area was altered permanently during the land development stage of the project. Possible drainage congestion during the construction process on top of the prevailing loss of storage basin and alteration of drainage pattern could further deteriorate the flooding in or near the project area.

#### Impacts on Water Sources

Water quality of nearby Meghna River branch and other canals/khals may deteriorate during the construction stage of CuEVL project due to changes in physical and chemical composition.

Changes in storage area and flow pattern during the construction phase could have adverse impact on the composition of surface water. Direct discharge of wastewater to the river would create further deterioration of surface water body. Discharge of hazardous materials such as oil, paints, due to accidental spillage, mismanagement or leaks may pollute surface water, as well.

#### *Impacts Associated with Sanitation*

During construction phase, problems related to sanitation and solid waste may result from improper/ inappropriate facilities at the labor sheds. At the peak of construction period, large numbers of workers are likely to be involved in different construction activities. Lack of proper sanitation facilities for project people, including the labors/ construction workers and absence of proper solid waste (e.g., food waste, construction debris) facilities may create an unhealthy environment (including water pollution) within and around the project site. Since CuEVL houses several existing sanitation and kitchen facilities, the workers in the new construction sites may use some of those facilities that could reduce associated impacts.

#### **4.8.4 Environmental Impacts during the Operation Stages**

Typical environmental impacts resulted during the operational phase may include:

- Impacts on water resources
- Wastewater and waste management
- Noise pollution
- Air pollution

#### *Impacts on Water Resources*

During the full operation stage of the CuEVL project area, approximately 20 industries will be operating regularly. Among these industries, there might be several industries which would require water as raw material. For example, if food processing and beverage industries extract ground water from the aquifer in the CuEVL area, it may lower the ground water table in or near the project area. Additionally, water required for drinking purposes and other personal use would also be extracted from the groundwater. The water extraction for personal use is small compared to the water extraction for industrial purposes. It is important to monitor the ground water level and recharge potential to assess and quantify the effect of ground water extraction on the ground water resources.

There is also a Centralized Effluent Treatment Plant that treat the wastewater from the industrial process, mainly from the Meghna Beverage Ltd. The CETP (Central Effluent Treatment Plant) help to reduce the impact of liquid waste generated in the industrial area. It is also important for new industries to check whether pollution load in their wastewater discharge is within the acceptable limit that can be treated in the CETP. If any industry exceeds the limit, it should install its own ETP to reduce the pollution that can be acceptable at the CETP.

During the operation stage, construction of most of the industries will be completed, which would reduce uncovered land in the project area. Roads are also constructed in the project area further reducing uncovered land area. As a result, surface run off would increase. This might create drainage problem in the project area. Also, the surface runoff would carry sediments and other contaminants with it. This would result in deterioration of water quality on the water body that would receive the runoff. The runoff water may also end up in the low-lying agricultural land surrounding the project area, which may result in water logging in the surrounding area, especially in the monsoon season.

### *Impacts from Wastewater and Solid Waste*

The Cumilla Economic Zone will house a number of industries such as Pharmaceutical Industry, Leather Goods and Footwear Industry, Glass Industry, Steel and Re-Rolling Mills etc. which have high potential of generating wastewater containing toxic heavy metals in the operation stage. If these wastewater is discharged without treatment, it would contaminate the receiving surface water and thus degrade the environmental quality. These industries should have their own ETP to treat this wastewater before disposal.

During the operation phase of the CuEZL project, the workers at various industries would generate wastewater. Municipal sewage generated from the project can cause unhygienic condition and environmental pollution, if proper sewer system is not implemented. If untreated sewage is disposed of to a surface water body, it could pollute the water body that receives the wastewater. If any industries have on-site sanitation system including septic tank for municipal sewage containment, they should be built properly. If these on-site sanitation systems are not properly built leakage from these systems may pollute groundwater. Additionally, if there is not proper fecal sludge management system built to treat the sludge from the onsite sanitation system, unregulated and uncontrolled disposal of sludge may pollute the environment.

The workers and employees working in various industries would generate solid wastes including organic wastes such as food waste, fruits and inorganic waste such as waste papers, damaged electronic goods, containers and liquid waste such as wastewater, oil, paint. The point of generation of the solid wastes could be the industrial processes, packaging area, cafeterias, and office rooms. The solid waste needs to be collected and disposed of properly. Improper disposal of the solid wastes such as on open land, through open drains or sewer pipe could result land pollution and drainage congestion. This could also lead to soil and groundwater contamination through the generation of leachate. If the solid waste is not removed from inside the project area regularly, it could result in unhealthy conditions in the premises and surrounding area including attracting nuisance insects such as flies and mosquitoes. As the solid waste is expected to be quite large at the CuEZL, it will be necessary to construct a TSDF (Treatment, Storage, and disposal facility) of appropriate capacity. A TSDF facilitates the collection, transportation, storage, treatment, and disposal of solid wastes including hazardous waste in environment friendly manner. Storage enables keeping the hazardous waste until they get treated or disposed of the disposal facility permanently disposes of the hazardous waste. Hazardous waste is disposed of in the specially designed units that protect groundwater and surface water resources. The CuEZL authority will contract a DOE authorized private party to collect and dispose the solid waste from the project area until a TSDF is built. All existing industries will dispose their solid waste through the hired party by the CuEZL in the absence of a TSDF. If the solid waste is not disposed properly, it would create solid waste disposal related impacts, as discussed above.

### *Noise Pollution and Vibration*

Prolonged exposure to a high level of noise may cause significant damage to human hearing organ and may cause neurological damage. OSHA noise exposure limits for the work environment provides a guideline for the time of noise exposure at the work environment which may be adopted to prepare an environmental management plan (Table 4.15). Therefore, noise assessment during the operational phase of different project components is particularly important.

**Table 4.15: OSHA noise exposure limits for the work environment**

<b>Noise (dBA)</b>	<b>Permissible Exposure (Hours and minutes)</b>
85	16 hrs
87	12hrs 6 min
90	8 hrs
93	5 hrs 18 min
96	3 hrs 30 min
99	2 hrs 18 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 90dB limit have been "time weighted" to give what OSHA believes are equivalent risks to a 90 dB eight-hour exposure. Source: Marsh, 1991, p. 322.

During the operation phase of the CuEZL project, the main source of noise would be the industrial processes due to operation of engine based power plants, industrial machineries and vehicles transporting raw materials and finished goods. Vehicle carrying the staffs and visitors to the project area would also contribute to the noise level. Machineries used in the industries would create significant noise. If proper personal protective equipment is not worn as per the mitigation measures listed in Chapter 7 the workers may have noise pollution related health effects.

The operation and honking of transportation vehicles could result in noise, which could have increased impacts in case of traffic jam. Office activities in the office building of the CuEZL and

other industries would contribute to low frequency noise that could have effect on the office staff and personnel working there for a significant amount of time of the day.

#### *Air Pollution*

During the operation stages of the CuEVL project, the number of vehicles in the area would increase. Emission from the increased number of vehicles would impact the air quality in the project area. The impact on air pollution is particularly critical in the dry season, since even at present condition PM<sub>10</sub> and PM<sub>2.5</sub> concentration levels exceed the National Ambient Air Quality Standards in Bangladesh set by the DoE (see Annex C). Glass industry and Re-Rolling and Steel Mills, Tiles and Ceramic Industry may emit air pollutants such as SPM, SO<sub>x</sub>, NO<sub>x</sub>, hydrocarbons, heavy metals especially Arsenic etc.

Dust may generate during the operation process in some industries. There could be airborne particulates and fiber which could be part of particulate matter emission. Cutting, fitting, fabricating, welding, grinding and painting process of leather goods industry would lead to additional particulate matter emission. There are also possibilities of fugitive emission of air pollutants including VOCs from paint, varnish, use of solvents. Since the industrial compounds are often closed buildings, therefore, the air pollutants get entrapped within the building and result in prolonged exposure for the workers and employees. It is also to be noted that, trans boundary pollution from India along with traffic emission are the major ambient air pollution sources in Bangladesh. Hence, the effect of industrial point source emissions can be very important locally to impact nearby population.

#### *GHG Emissions*

Power supply in the CuEVL will come both from the national grid and captive generators. Ultimate capacity of captive generators may be as much as 100 MW which will not be supported by IPFF-II project and will be financed by CuEVL from its own resources. The generators are likely to be based on 20-30 MW capacity internal combustion engines which have efficiency of around 35%. Without emission reduction measures as much as 400,000 tons of CO<sub>2</sub> may be emitted due to power generation using simple Cycle NG engine based Plants. However, use of tri-generators for which efficiency is in the range of 75% to 85%, may reduce more than 50% of CO<sub>2</sub> emission. To reduce GHG emissions co-production of industrial process steam and chilled water for space cooling (using absorption cooling method) are used in the tri-generators. The total energy efficiency of such systems will be much higher leading to GHG emission savings can be up to 50%. There is a plan for installation of a Solar PV system, which would lead to emission savings as well. Even a 1-MW capacity SPV may save up to 1500 tons of CO<sub>2</sub> emission per year. As per capita GHG emission in Bangladesh is only 1.54Kg per year, compared to 6.9 Kg for world average, the investment for GHG emission reduction at CuEVL will be voluntary, but it may likely generate considerable savings in energy cost, if the emission savings measures, as discussed, are adopted.

#### **4.8.5 Cumulative Impact**

Though there are no existing industries in CuEVL at this moment, it will house more than fifteen types of industries. It would take a long time before the full operation of all industries begin. When new industries start their operation, additional impacts may result from these operation processes. Even small impacts from the individual industry can add up and increase the cumulative effects. There are several industries near the CuEVL project area, which could add to the pollution and environmental impacts. For any environmental monitoring and management system effects of all these industries inside and outside the CuEVL area need to be considered.

Proper environmental management plan should be prepared and followed to avoid, mitigate, or reduce the impacts resulted from cumulative effects of all industries.

The environmental impacts are summarized in Table 4.16. The physico-chemical environmental parameters that could be affected by the project activities include water quality, soil quality, air quality and noise level.

**Table 4.16: Assessment of impacts due to project activities on physico-chemical parameters**

Physico-chemical parameters	Magnitude of Impacts						
	Positive impact			No impact	Negative impact		
	Low	Medium	High		Low	Medium	High
<b>Pre-Construction Stage</b>							
Loss of storage basin	X (S)						
Obstructing the of natural drainage pattern	X (L)						
Loss of agricultural land	X (S)						
Quality of surface water	X (L)						
Quality Soil	X (L)						
Loss of aquatic biota	X (L)						
<b>Construction Stage</b>							
Water quality	X (S)						
Loss of natural drainage	X (L)						
Soil quality	X(L)						
Air quality	X (S)						
Noise level	X (S)						
Drainage congestion	X (S)						
<b>Operation Stage</b>							
Water quality	X (S)						
Loss of natural drainage	X (L)						
Water resources	X(L)						

Soil quality	X
Air quality	X (S)
Noise level	X (L)

Note: S=Short-term; L=Long-term

## 4.9 Ecological Impacts

### 4.9.1 Potential Ecological Impacts

The ecological impact assessment procedure involves ecological impact identification and evaluation processes. Impacts are identified through interactions between the proposed CuEZL project activities and ecological sensitivities, while impacts are evaluated on the strengths of the likelihood of occurrence as well as the rating of their magnitude and significance. As noted earlier, some section of the proposed CuEZL project site has already been developed and remaining section are under develop as industrial plot where different types of industry will be installed. In CuEZL area, some industries are now in operation mode, others are either in construction or planning stages. Various types of activities, with different dimensions and intensities, will be carried out during construction and operation phases of new industries as well as existing industries. These activities would have potential impacts on ecological compartment of the environment.

Major ecological aspects that are considered for the ecological impact assessment for the proposed CuEZL project includes clearing and alteration of land, excavation of land, uprooting of floras, damage / disturbance of faunal community / habitat, disturbance / damage of fish habitat / passage, placement of materials, construction work, movement of people and vehicle (on road, and river), accident (e.g. spills), waste disposal, etc. During construction, land related activities are likely to have some adverse impact on its existing ecological environment. During operation, ecological impacts may result from improper disposal of wastes, waste water discharge, etc. in existing eco-environment that might be used by certain type of fauna, fish and flora. Potential ecological impacts for the proposed CuEZL project could be divided into two broad categories viz. (a) direct impact and (b) indirect impact. Details of these impacts on the existing flora, fauna and fish community are described below.

#### *Potential Impacts on Fauna including Fish*

As noted earlier, the proposed CuEZL project site and adjacent areas have various assemblage of flora that are used by certain types of local fauna as their permanent/ temporary/ foraging/ resting habitat. Generally, flora provide habitat for insects and produce fruit that are consumed by several type of fauna. The proposed project site and adjacent areas have both exotic and native flora that are used by certain types of adaptive native fauna. Uprooting of flora will destroy the faunal habitat forever. Land uprising and excavation related activities for the proposed project could have some potential impacts (direct and indirect) on the existing faunal environment, including the identified two threatened terrestrial fauna, due to their high sensitive and reactive behavior in response to disturbance that may occur at or near their habitat. Faunal species that are sensitive to direct (e.g. human activity) or indirect disturbance (noise) would be impacted most. Habitat disturbance would reduce habitat availability and effectiveness for a certain period for mammals, reptiles, amphibians, birds and their predators. There are also some possibilities of direct mortality and displacement of amphibians, reptiles and mammals from the

use of vehicle or machineries over the terrestrial faunal habitat or deposition of excavated soil/ sand on faunal habitat. Quantifications of these losses are difficult; however, the impact is expected to be low to medium intensity, and also short or medium or long term in nature.

A small pond exists in the project site. Various types of aquatic habitats also exist, adjacent to the proposed CuEZL project site. Some threatened fish species exists in the adjacent aquatic habitats of the proposed project site, and these fishes are also threatened for entire country. Drying of any aquatic habitat will create adverse impact to the existing aquatic faunal and fish community. A tributary of Meghna River exists in the periphery of the proposed project site. The Ganges River Dolphin - *Platanista gangetica*, a threatened mammalian fauna, exists in the tributary of Meghna River, especially in the rainy season when the prey species are abundant. Generally, any action/s near any aquatic habitat/s (e.g. during operation, discharge of fuel/ spill, dredge spoils into the tributary, etc.) may have some potential adverse impacts on the existing aquatic faunal & fish species, e.g. mortality, disturbance of fish passage during monsoon, deposition of excavated soil on fish habitat, contamination of water, destruction of shallow fish habitat or saturated ground. During construction work of proposed components setup, which may have impacts (direct/ indirect) on fresh-water fish habitats, fish diversity, and hence, to some extent on production of capture fisheries. Navigational activities for transporting construction materials through navigational route of Meghna River tributary may result minor disturbance to fish movement/ migration, but increased turbidity in water column may attract some fish species for food sourcing.

Some typical conservation measures [e.g. initiation of awareness program on (i) fuel spilling issue for related offices/ personnel's, (ii) establishment of billboard/ poster or leaflet distribution on conservation issues – specially for threatened species (e.g. dolphin), etc. could be taken to reduce such impacts]. Therefore, various types of construction activities (e.g. earth work, piling, noise, structure establishment, etc) at or near the Meghna River tributary will also impact the threatened species (e.g. dolphin) foraging area, aquatic food sources, habitat, etc. Program should have to be taken to complete the development work within the short time frame (e.g. exclude dolphin breeding season). A separate year-round monitoring program on G. R. Dolphin, a major aquatic indicator species, could be initiated that will provide health status of Meghna River tributary.

Operational activities that could affect ecological components/ biodiversity include improper maintenance or preventive measures for any leakage, and improper disposal of industrial or domestic waste/ wastewater could also pose a threat to the existing ecological components/ biodiversity. Therefore, improper disposal of waste and sewer from CuEZL could also impact the ecological components/ biodiversity.

#### *Potential Impacts on Flora*

As noted earlier, the proposed CuEZL project site has some floral diversity (Annex B), but the adjacent areas have plenty of floral diversity, which are used by certain types of fauna. None of these floras, at project site and adjacent areas, are threatened in Bangladesh. The floras of the proposed project site (sand filled upraised char-agro-wetland) might have to be cleared for the construction of the proposed CuEZL project components; hence, local adverse impacts are expected though the adjacent areas have some of these floral species. Land alteration will create adverse impact to the local fauna which use the site as their habitat (permanent or temporary or foraging). Some terrestrial undergrowth exists within the project site and adjacent areas, and this undergrowth contributes to maintain a balance in the existing environment. Most of the terrestrial floral species are planted by the local people for their livelihood, and all of these floras are common throughout the proposed project adjacent areas. Terrestrial floras that exist beside the existing road have been planted by the respective authority (RHD, LGED etc.) of

Bangladesh government. The project-related activities may involve other adjacent lands on a temporary basis, and some impact on ecological aspects of those lands might be occurred. People, vehicle, and material movement over the aquatic floral habitat may cause damage or uproot them from their habitat. The proposed project has some adjacent aquatic habitat with common aquatic floral diversity, and little impacts on these floral habitats are expected, if those lands are needed to be used temporarily for short or medium or long term.

#### **4.9.2 Evaluation of Ecological Impact**

A semi-quantitative descriptive checklist method has been applied to evaluate the ecological impact for the proposed ‘Cumilla Economic Zone Limited’ project and its associated activities. Firstly, the activities during construction and operational phases have been identified and listed in the impact table. Then, the corresponding impacts on the specific ecological aspects (terrestrial & aquatic: flora, fauna & fish) have been evaluated based on the baseline scenario and an assessment of the typical ecological interactions with the project activities. Assessments have been made as to whether the impacts are positive (beneficial) or negative (harmful), short-term (short recovery time) or long-term (extended recovery time); and of high or medium or low intensity. The results of the assessment are summarized in Table 4.17, which indicates that most of the evaluated ecological impacts are negative, low to medium with both short-term and long-term effects.

**Table 4.17:** Ecological impacts evaluation that may result from the activities associated with the proposed ‘Cumilla Economic Zone Limited’ project

Source of Potential Impacts	Ecological Aspects											
	Flora		Fish	Fauna								
				Amphibia		Reptile		Bird		Mammal		
	AQ	TR		AQ	TR	AQ	TR	AQ	TR	AQ	TR	
<b>During Construction</b>												
Camp setting	0	-1S	0	0	-1S	0	-1S	0	-1S	0	-1S	
Access road construction (camp & project site)	-1L	-1L	-1L	-1L	-1L	-1L	-1L	-1L	-1L	0	-1L	
Land clearing &/ alteration	-1L	-1L	-1L	-1L	-1L	-1L	-1L	-1L	-1L	0	-1L	
Wetland drying	-1L	0	-1L	-1L	0	-1L	0	-1L	0	0	0	
Soil excavation	0	0	0	0	0	0	0	0	+1S	0	-1L	
Flora removal	-1L	-1L	-1L	-1L	-1L	-1L	-1L	-1L	-1L	0	-1L	
Machinery & vehicle use (Noise generation & vibration)	0	0	-2S	-1S	-1S	-1S	-1S	-1S	-1S	-2S	-1S	
Water quality deterioration	-1S	0	-1S	-1S	0	-1S	0	-1S	0	-1S	0	
Sewage discharge on soil/ water	+1S	+1S	-1S	-1S	-1S	-1S	-1S	-1S	-1S	-1S	-1S	
Construction activities on the char agro-wetland	-1L	-1L	-1L	-1L	-1L	-1L	-1L	-1L	-1L	0	-1L	
<b>During Operation</b>												
General waste and sludge disposal on land/ water	-1S	-1S	-1S	-1S	-1S	-1S	-1S	-1S	-1S	-1S	-1S	
Industrial waste and sludge disposal on land/ water	-1L	-1L	-2L	-1L	-1L	-1L	-1L	-1L	-1L	-2L	-1L	

Source of Potential Impacts	Ecological Aspects										
	Flora		Fish	Fauna							
				Amphibia		Reptile		Bird		Mammal	
	AQ	TR		AQ	TR	AQ	TR	AQ	TR	AQ	TR
Leakage/ Spill on land/ water	-1S	-1S	-1S	-1S	-1S	-1S	-1S	-1S	-1S	-1S	-1S

[Legend: AQ = Aquatic; TR = Terrestrial; 3 = High impact, 2 = Medium impact, 1 = Low impact, 0 = No impact (negligible impact), S = Short term impact, L = Long term impact, +/- = positive/negative impact]

### 4.9.3 Risk Assessment

A typical eco-environmental risk assessment matrix has been developed for the ecological aspects of the proposed CuEZL project of MGI. Table 4.18 shows the consequence severity ranking (from low to critical); Table 4.19 shows the likelihood ranking (from “almost certain” to “rare”), along with frequency level for each ranking; Table 4.20 shows the ecological impact significance rankings; and Table 4.21 shows the risk assessment matrix, which is based on consequence severity and likelihood/ frequency of occurrence of an event; risk has been classified from ‘low’ to ‘extreme’ for the proposed CuEZL project.

**Table 4.18:** Ecological consequence levels for the proposed CuEZL project

Category	Ranking	Definition
Critical	5	<ul style="list-style-type: none"> <li>Very serious environmental effects with impairment of ecosystem function.</li> <li>Long-term, widespread effects on significant environment (e.g. unique habitat, national park)</li> <li>Habitat restitution time &gt;100 years and requiring extreme substantial intervention.</li> <li>Serious environmental effects with some impairment of ecosystem function (e.g. displacement of species).</li> </ul>
Major	4	<ul style="list-style-type: none"> <li>Relative widespread medium-long term impacts.</li> <li>Habitat restitution time &gt;10 years and requiring substantial intervention.</li> <li>Potential for continuous non-compliance with environmental regulations and/or company policy.</li> </ul>
Medium	3	<ul style="list-style-type: none"> <li>Moderate effects on biological environment but not affecting ecosystem function.</li> <li>Moderate short-medium term widespread impacts</li> <li>Habitat restitution time 1-5 years (possible limited and local areas upto10 years) with potential for full recovery and limited or no intervention required.</li> <li>Potential for short to medium term noncompliance with environmental regulations and / or company policy.</li> </ul>
Minor	2	<ul style="list-style-type: none"> <li>Minor effects on biological environment.</li> <li>Minor short-medium term damage to small area of limited significant</li> <li>Full recovery in &lt;1 year without intervention required.</li> <li>Any potential non-compliance with environmental regulations and/or Company policy would be minor and short-term.</li> </ul>
Low	1	<ul style="list-style-type: none"> <li>No lasting effect.</li> <li>Low-level impacts on biological environment.</li> <li>Limited damage to minimal area of low significant.</li> <li>Compliance with environmental regulations and/or company policy at all times.</li> <li>Possible beneficial effect or ecosystem improvement.</li> </ul>
None	0	<ul style="list-style-type: none"> <li>No impact on ecosystem damage.</li> <li>No compliance required for environmental regulations and / or company policy at all times.</li> <li>Possible beneficial effect or ecosystem improvement.</li> </ul>
Limited Positive	+	<ul style="list-style-type: none"> <li>Some beneficial improvement to ecosystem.</li> <li>Benefits to specific flora and / or fauna.</li> </ul>
Modest Positive	++	<ul style="list-style-type: none"> <li>Moderate beneficial improvement to ecosystem.</li> <li>Medium benefits to specific flora and / or fauna.</li> </ul>
Significant Positive	+++	<ul style="list-style-type: none"> <li>Major beneficial improvement to ecosystem.</li> <li>Large scale benefits to specific flora and / fauna.</li> </ul>

**Table 4.19:** Likelihood of occurrence and rankings for the proposed CuEZL project

<b>Impact Likelihood</b>	<b>Ranking</b>	<b>Definition</b>	<b>Impact Frequency</b>
Almost Certain (80-100%)	5	The activity will occur under normal operating conditions.	Very Frequent (High frequency of occurrence - occur more than one per month)
Very Likely (60-80%)	4	The activity is very likely to occur under normal operational conditions.	Frequent (Regular frequency. Event likely to occur at least once per year)
Likely (40-60%)	3	The activity is likely to occur at some time under normal operating conditions.	Occasional (Occurs once every 10 years)
Unlikely (20-40%)	2	The activity is unlikely to but may occur at some time under normal operating conditions.	Few (Unlikely to occur during life of operations - occurs once every 10 - 100 years)
Very Unlikely (0-20%)	1	The activity is very unlikely to occur under normal operating conditions but may occur in exceptional circumstances.	Rare (Highly unlikely to occur during life of the operation. Occurs less than once every 100 years).

### **Impact Significance**

The significance of ecological impact for the proposed CuEZL project has been determined by calculating the consequence and likelihood of occurrence of the activity, expressed as follows:

$$\text{Significance} = \text{Consequence} \times \text{Likelihood}$$

The above Tables illustrate all possible consequence X likelihood product results for the five consequences and likelihood categories. The possible significance rankings are presented in Table 4.20.

**Table 4.20:** Ecological impact significance rankings for the proposed CuEZL project

<b>Ranking (Consequence X Likelihood)</b>	<b>Significance</b>
>16	Critical
9-16	High
6-8	Medium
2-5	Low
<2	Negligible

**Table 4.21:** Risk assessment matrix for the proposed CuEZL project

<b>Likelihood / Frequency</b>	<b>Consequence Severity</b>				
	<b>Low</b>	<b>Minor</b>	<b>Medium</b>	<b>Major</b>	<b>Critical</b>
<b>Almost Certain</b>	High	High	Extreme	Extreme	Extreme
<b>Very Likely</b>	Medium	High	High	Extreme	Extreme
<b>Likely</b>	Low	Medium	High	Extreme	Extreme
<b>Unlikely</b>	Low	Low	Medium	High	Extreme
<b>Very Unlikely</b>	Low	Low	Medium	High	High

In Table 4.22, the potential impacts of the proposed CuEZL project activities on the existing ecological aspects (e.g. flora, fauna and fish species) have been ranked on the basis of basis of consequence severity ranking (Table 4.18), likelihood/ frequency ranking (Table 4.19), impact significant ranking (Table 4.20) and risk rating (Table 4.21). Both the “consequence severity”

and “risk” of the possible impacts have been categorized as “low”, while likelihood/ frequency” has been categorized as “possible”. Thus, the proposed CuEZL project is likely to have some significant adverse impact on the existing ecological environment. However, the identified impacts could be minimized to some extent by adopting appropriate mitigation measures.

**Table 4.22:**Summary of Potential Ecological Impact Assessment: (Impact significant = Impact / Risk Rating) for the proposed ‘Cumilla Economic Zone Limited’ project

Potential Impacts Source / Project Activities	Impact	Ecological Receptor Type	Description	Likelihood	Consequence	Risk Rating
Site preparation / clearing for base camp and associated activities	Floral destruction	Flora	<ul style="list-style-type: none"> <li>• Direct</li> <li>• Negative</li> <li>• Long term</li> <li>• Local</li> <li>• Reversible</li> </ul>	Unlikely	Minor	Low
	Loss to utilize the flora as faunal habitat.	Fauna	<ul style="list-style-type: none"> <li>• As above</li> </ul>	Unlikely	Minor	Low
	Loss/ alteration of faunal habitat	Fauna	<ul style="list-style-type: none"> <li>As above</li> </ul>	Unlikely	Minor	Low
	Increased access for exposed faunal harassment or killing (e.g. snake, rat)	Fauna	<ul style="list-style-type: none"> <li>• Direct</li> <li>• Negative</li> <li>• Long term</li> <li>• Local</li> <li>• Irreversible</li> </ul>	Unlikely	Minor	Low
Soil excavation	Habitat destruction of terrestrial/ aquatic flora (herb, shrub)	Flora and Fauna	<ul style="list-style-type: none"> <li>• Direct</li> <li>• Negative</li> <li>• Long term</li> <li>• Local</li> <li>• Reversible</li> </ul>	Unlikely	Minor	Low
	Movement disturbance/ habitat destruction of terrestrial (burrow) fauna (amphibia, reptile, bird & mammal)	Flora and Fauna	<ul style="list-style-type: none"> <li>• As above</li> </ul>	Unlikely	Minor	Low
Soil/ sand accumulation on char agro-wetland	Habitat destruction of terrestrial/ aquatic flora (herb, shrub)	Flora and Fauna	<ul style="list-style-type: none"> <li>• Direct</li> <li>• Negative</li> <li>• Short term</li> <li>• Local</li> </ul>	Unlikely	Medium	Medium

Potential Impacts Source / Project Activities	Impact	Ecological Receptor Type	Description	Likelihood	Consequence	Risk Rating
			<ul style="list-style-type: none"> <li>•Reversible</li> </ul>			
	Movement disturbance/ habitat destruction of terrestrial (burrow) fauna (amphibia, reptile, bird & mammal)	Flora and Fauna	<ul style="list-style-type: none"> <li>•As above</li> </ul>	Unlikely	Medium	Medium
Land uprising	Movement disturbance / habitat destruction of terrestrial (burrow) fauna (amphibia, reptile, bird & mammal)	Fauna	<ul style="list-style-type: none"> <li>•Direct</li> <li>•Negative</li> <li>•Long term</li> <li>•Local</li> <li>•Reversible</li> </ul>	Unlikely	Medium	Medium
	Reduction of access to the utilized land and its resources	Fauna	<ul style="list-style-type: none"> <li>•As above</li> </ul>	Unlikely	Medium	Medium
Drying wetland	Reduction of access to the utilized wetland and its resources	Flora, Fauna & Fish	<ul style="list-style-type: none"> <li>•As above</li> </ul>	Unlikely	Minor	Low
Land utilization for base camp	Reduction of access to the utilized land and its resources.	Flora and Fauna	<ul style="list-style-type: none"> <li>•As above</li> </ul>	Likely	Low	Low
Construction of base camp and related activities.	Disturbance of soil dwelling fauna (e.g. rat, bee-eater)	Fauna	<ul style="list-style-type: none"> <li>•Direct</li> <li>•Negative</li> <li>•Short term</li> <li>•Local</li> <li>•Reversible</li> </ul>	Likely	Minor	Low
Construction of Boundary wall	Movement disturbance of terrestrial fauna (e.g. amphibia & mammal)	Fauna	<ul style="list-style-type: none"> <li>•Direct</li> <li>•Negative</li> <li>•Long term</li> <li>•Local</li> <li>•Reversible</li> </ul>	Likely	Medium	Medium
Material storage/ placement	Habitat destruction of terrestrial flora (e.g. herb, shrub)	Flora and Fauna	<ul style="list-style-type: none"> <li>•Direct</li> <li>•Negative</li> <li>•Short term</li> </ul>	Unlikely	Minor	Low

Potential Impacts Source / Project Activities	Impact	Ecological Receptor Type	Description	Likelihood	Consequence	Risk Rating
			<ul style="list-style-type: none"> <li>• Local</li> <li>• Reversible</li> </ul>			
	Borrowing faunal habitat and Movement disturbance of terrestrial fauna (e.g. amphibia, reptile, aves & mammal)	Flora and Fauna	<ul style="list-style-type: none"> <li>• As above</li> </ul>	Unlikely	Minor	Low
Vehicle movement	Impairment of terrestrial flora (herb & shrub) and terrestrial fauna (amphibia, reptile & mammal)	Flora and Fauna	<ul style="list-style-type: none"> <li>• As above</li> </ul>	Unlikely	Minor	Low
Cargo Ship Movement	Disturbance of aquatic mammals (dolphin) and fishes including Hilsa fish movement during breeding period.	Fauna and Fish	<ul style="list-style-type: none"> <li>• Direct</li> <li>• Negative</li> <li>• Long term</li> <li>• Local</li> <li>• Reversible</li> </ul>	Unlikely	Minor	Low
Equipment installation on land	Habitat destruction of terrestrial flora (herb, shrub)	Flora	<ul style="list-style-type: none"> <li>• As above</li> </ul>	Unlikely	Minor	Low
	Movement disturbance of terrestrial fauna (e.g. amphibia, reptile & mammal)	Fauna	<ul style="list-style-type: none"> <li>• As above</li> </ul>	Unlikely	Minor	Low
Construction and associated activities (e.g., structure, rod binding, welding etc.) for various components of CuEZL project.	Generation of high intensity welding flash and noise	Fauna	<ul style="list-style-type: none"> <li>• Direct</li> <li>• Negative</li> <li>• Short term</li> <li>• Local</li> <li>• Reversible</li> </ul>	Unlikely	Minor	Low
	Contamination of surface soil / water with used lubricant, if any	Flora, Fauna & Fish	<ul style="list-style-type: none"> <li>• As above</li> </ul>	Unlikely	Minor	Low
Noise disturbance	Disturbance of terrestrial faunal livelihood [movement, foraging, breeding] (amphibia, reptile, bird & mammal)	Fauna	<ul style="list-style-type: none"> <li>• As above</li> </ul>	Unlikely	Minor	Low
Vibration disturbance	Disturbance of terrestrial & aquatic faunal livelihood [movement, foraging, breeding]	Fauna & Fish	<ul style="list-style-type: none"> <li>• As above</li> </ul>	Unlikely	Medium	Medium

Potential Impacts Source / Project Activities	Impact	Ecological Receptor Type	Description	Likelihood	Consequence	Risk Rating
	(amphibia, reptile, bird, mammal & fish)					
Water quality	Water contamination due to project related activities (e.g. waste disposal & sewer discharge).	Fauna and Fish	• As above	Unlikely	Minor	Low
Exhaust from generators	Movement disturbance of terrestrial fauna (e.g. aves)	Fauna	• As above	Unlikely	Minor	Low
Leakage / Spills (oil / chemical) on land or water	Habitat destruction of flora, fauna and fish.	Flora and Fauna	• As above	Very Unlikely	Minor	Low
Waste generation: (Solids/ liquid/ gaseous) (e.g. cement bag, exhaust from crane/ heavy equipment, domestic waste, industrial waste, etc.)	Impairment of the health of terrestrial flora, fauna & fish	Flora and Fauna	• As above	Unlikely	Minor	Low
	Nuisance noise, dust, emissions, lighting etc	Flora and Fauna	• As above	Unlikely	Minor	Low
	Increased level of disease vectors (mosquitoes, rats, flies, etc)	Flora and Fauna	• As above	Unlikely	Minor	Low
	Contamination of water and soil due to sewage discharge (e.g. increase in water borne diseases)	Fauna and Fish	• As above	Unlikely	Minor	Low
Decommissioning • Repair of damaged roads • Removal of structures • Restoration of site	Nuisance (e.g. noise, emission, vibration) from heavy machinery.	Fauna	• As above	Unlikely	Minor	Low

The above table indicates that all ecological impacts are rated as negative with low impacts except soil/ sand accumulation on char agro-wetland, land uprising, fencing/ boundary wall construction and vibration disturbance – all of which are rated as negative with medium impacts. Thus, the floral, faunal and fish species or their community are expected to be adversely impacted by low to medium intensity with long term effect, though the nearby areas have sufficient amount of sympatric terrestrial flora and fauna as well as fish species.

## **4.10 Socio Economic Impacts**

The social impact assessment involves social impact identification and evaluation of impacts for risk assessment. Identified impacts are resulted through interactions between the proposed CuEZL Project activities and socio-economic status in or near the project area. These impacts are evaluated on the strengths of the likelihood of occurrence as well as the rating of their magnitude and significance.

### **4.10.1 Potential Socio-economic Impact**

Potential impact identification and assessment is crucial for any development project. Construction of proposed CuEZL project has some potential impacts (direct or indirect) (positive or negative) on its existing socio-economic environment. These are local people's life and livelihood (e.g. resettlement, income issues); land clearing, alteration and utilization; construction time / season; pressure on exiting road and river; people and vehicle movements; material placement; excavation; accident; employment issues; local business (e.g. opportunities for contracting, supply of food and supplies); conflicts / third party agitations over employment issues; nuisance noise, dust, emission, lighting; generation of domestic waste / sewage disposal; increase in usage of roads and waterways with possibilities of accidents; health care facilities; water and sanitation issues; social crimes etc. have direct or indirect impacts on its existing socio-economic environment. During operation / action, small scale impacts could be identified by studying or monitoring the associate socio-economic aspects. Large scale impact could be identified, if any, after completion of the proposed actions, though it requires more time and resources. However, the following section provides detail impact assessment for the proposed CuEZL project and its associated activities.

#### *Employment and Economy*

During the construction phase of the project, job opportunities would be created for labors as well as skilled manpower such as engineers. Additional employment gain would be resulted in the supply-chain system of construction materials required for project activities. Requirements of construction materials would also positively impact the job growth in the manufacturing sector that generates various construction materials including steels and cement.

During the operational phase of the project, there will be possibility of generating more than 5000 jobs in the CuEZL project area. Various industries in the project area would hire workers of different skill levels as well as employee with specialized expertise. There will be an administrative office of the CuEZL in the project area, which will also create additional job opportunities.

The additional jobs would improve the economy of the surrounding area of the project. Additional income of the people living in the community will also foster the growth of small businesses including grocery shops, restaurants, local housing, local transportation, shopping centers, in the project surrounding area. Also, the migrant workers coming from outside of the project area will also boost the economy by increasing the demand for housing, restaurant, transportation, and other shopping needs.

#### *Traffic Condition*

During the construction stage, transportation of construction materials would increase traffic flow in CuEZL project area. The project area is located very close to the Dhaka-Chattogram national highway (N1). The increased traffic demand may not create traffic congestion because of the higher capacity of the N1 National Highway. However, continuous entry and exit of the

traffic from the N1 to the CuEVL project may slow down the traffic. As the average speed on the highway is high, slowing down of construction vehicle can be a hazard to vehicle operating in the highway in regular speed.

During the operational stage, traffic flow would increase in the local road of the project area at the time start and end of office hours. Increased traffic at peak hours during the operational phase of the project, may create hazard to high speed vehicles because of their slow speed during entry and exit.

#### *Community Health and Safety*

Improper health and safety policy maintained at the project area during the construction phase may lead to outbreak of different diseases to the surrounding communities through sick workers working at the project. Noise and vibration from the operation of construction related vehicles and construction machines and equipment may affect the health of the surrounding community. Emission from vehicles and dust from construction activities would add to the particulate matter concentration in the air. This added air pollution level may cause health issues including asthma, respiratory illness, to the people in the community, especially in the dry season.

If the health and safety policy are not properly maintained during the operational phase, different disease outbreaks may result in the surrounding communities through sick staffs and personnel working in the project area as well as from visitors. Increased traffic would lead to the increase in noise and air pollution from the operation of vehicles leading to health issues in the communities near the project area.

#### *Occupational Health and Safety*

Construction workers may face occupational health hazards such as minor or major injuries if there is lack of general safety requirements and precautions applicable for such sites, malfunctioning equipment, careless use of equipment and vehicles. Poorly designed temporary accommodation and sanitation facilities may pose a health threat and nuisance to the workers. Uncontrolled vending of food and drinking water on the work site may also pose a risk with respect to the transmission of contagious diseases like Typhoid, Diarrhea, Malaria, Dengue, etc. Construction workers will be required to handle hazardous materials such as cement, paints, chemicals, fuels etc., which may increase health risks of workers. High noise from the heavy construction machines would also pose a threat to the construction workers. Accident during construction phase is also an important issue. Proper measures including regular maintenance of equipment and use of protective gear are needed to reduce the risk of such accidents during the construction phase. A complete plan on Occupational Safety and Health to mitigate the impacts has been provided in Chapter 7.

During operational phase more than 5000 staffs and personnel would work in the CuEVL project area. There could be health and safety risks that may occur during their stay in the industry and office. These impacts may include:

- Accidents due to move/ fall down from the roof/ balcony and using the stairs;
- Fire hazards from short circuits/cooking stoves/careless handling of materials that can generate fire;
- Inadequate lighting and ventilation in and outside the building complex;
- Noise and vibration from machineries and other equipment;
- Accidents in the elevators in case of inadequate power supply and lack of generators;
- Inadequate quantities and/or poor-quality water supply and sanitation facilities;

- Poor cleanliness of the building occupants;
- Lack of daily cleaning and regular maintenance of inside and outer side of the complex;
- Safety of the security guards who would work in the night shift.

#### **4.10.2 Evaluation of Social Impacts**

A semi-quantitative descriptive checklist method has been applied to evaluate the socio-economic impact for the proposed CuEZR project activities. The activities during construction and operation phases and their socio-economic impacts have been identified. The impacts on the social aspects have been evaluated depending on typical interaction of social components with CuEZR project activities. For impact evaluation, the impacts are grouped as positive (beneficial) or negative (harmful), short-term (short recovery time) or long-term (extended recovery time) and of high or medium or low intensity. The results of the evaluation are summarized in Table 4.23, which show that most of the evaluated impacts are medium negative impact with long term effect in nature.

**Table 4.23:** Evaluation of socio-economic impacts that may result from the activities associated with the proposed CuEzL project implementation

Phase	Sources of Potential Impacts	Potential Socio-Economic Impacts								
		Loss of private land & properties ownership	Hinder of land use	Hinder of Fishing & associate activities	Loss of income	Traffic congestion		Water logging	Health & Safety	Employment & Commercial activities
Construction Phase	Private agro-wetland acquisition		-1L	-1L	0	-1L	0	0	0	0
	Base camp setting & associated activities		-1S	-1S	0	-1S	0	0	0	+1S
	Private agro-wetland clearing and alteration		-1L	-1L	-1L	-1L	0	0	-1S / -1L	0
	Boundary wall & fence		0	-1L	-1L	-1L	0	0	-1S/-1L	+1L
	Development of economic zone & ancillary work (e.g. internal road, sand-fill, tree removal, etc)		-1L	-1S	0	0	-1S	-1S	-1S/-1L	+1S
	Construction material transport		0	0	0	0	-1S	-1S	-1S/-1L	0
	Machinery use (noise generation)		0	0	-1S/-1L	-1S/-1L	0	0	-1S/-1L	0
	Water quality deterioration		0	0	0	0	0	0	-1S/-1L	0
	Sewage discharge on soil/ water		0	-1S	0	-1S/-1L	0	0	-1S/-1L	0
	Waste dispose on soil / water		0	-1S/-1L	-1S/-1L	-1S/-1L	0	0	-1S/-1L	0
Operation Phase	More human & vehicle in existing narrow road		0	0	0	0	-1S	0	-1S/-1L	0
	Provision for safe water and sanitation facilities for workers		0	0	0	0	0	0	+1S/+1L	0
	Solid waste and wastewater generation by O & M staffs		0	0	0	0	0	0	-1S/-1L	0
	Access to safe water supply to O & M staffs		0	0	0	0	0	0	+1S/+1L	0
	More human & vehicle in existing narrow road		0	0	0	0	-1S	0	-1S/-1L	0
	Spills (oil and dredge spoil) on land/ water		0	0	0	-1S/-1L	0	0	-1S/-1L	0
	Emission (from machinery) into air		0	0	0	0	0	0	-1S/-1L	0

Legend: +3 = High Positive Impact, +2 = Medium positive impact, +1 = Low Positive Impact, 0 = No impact, -1 = Low Negative Impact, -2 = Medium Negative Impact, -3 = High Negative Impact, S = Short term impact, L = Long term impact.

### 4.10.3. Risk Assessment

A typical socio-environmental risk assessment matrix has been developed on the socio-economic aspects that exist within and outside of the proposed CuEVL project site. Table 4.24 shows the consequence severity ranking (from low to critical), Table 4.25 shows the likelihood ranking (from “almost certain” to “rare”), along with frequency level for each ranking. Table 4.26 shows the Impact significance rankings and Table 4.27 shows the risk assessment matrix, which is based on consequence severity and likelihood/ frequency of occurrence of an event; risk has been classified from “low” to “extreme” for the proposed CuEVL project.

**Table 4.24:** Socio-environmental consequence levels for the proposed CuEVL project

Category	Ranking	Definition
Critical	5	<ul style="list-style-type: none"> <li>Emergency situation with harmful consequences to human health (e.g. fatalities).</li> <li>Disastrous consequences on the livelihoods of individuals (e.g. curtailment of access to primary income source).</li> <li>Calamitous consequences on those seeking to access community facilities and utilities [e.g. resettlement of large numbers of households (1000+)]</li> <li>Disastrous consequences on the economy (e.g. all employment and supplier sourcing out with Bangladesh).</li> <li>Breach of company / contractor social policy and/or legislation.</li> </ul>
Major	4	<ul style="list-style-type: none"> <li>Major impact on human health (e.g. serious injury).</li> <li>Significant impact on the livelihoods of individuals (i.e. access to income source restricted over lengthy periods of time).</li> <li>Serious impact on access to community facilities and utilities [e.g. resettlement of large numbers of households (10 - 100+)].</li> <li>Notable consequence on the economy, at a local, regional and/or national level (e.g. virtually no local sourcing of supplies or personnel).</li> <li>Breach of company / contractor social policy and/or legislation.</li> </ul>
Medium	3	<ul style="list-style-type: none"> <li>Modest impact on human health and well-being (e.g. noise, light, odour, dust, injuries to individuals).</li> <li>Moderate impact on individual livelihoods (e.g. restricted access to income source).</li> <li>Medium impact on access to community facilities and utilities [e.g. access to utilities restricted for long periods (weeks) of time]. Average impact on the wider economy, at a local, regional and/or national scale (e.g. only moderate levels of employment and supplies sourced within Bangladesh).</li> <li>Potential breach of company / contractor social policy and/or legislation.</li> </ul>
Minor	2	<ul style="list-style-type: none"> <li>Limited impact on human health and well-being (e.g. occasional dust, odours, traffic, noise).</li> <li>Some impact on the livelihoods of individuals (e.g. isolated incidents related to cultural tensions and some restriction on access to income source).</li> <li>Some impact on access to community facilities and utilities (e.g. access to cultural centers restricted to a limited extent, i.e. (days)</li> <li>Sparse impact on the wider economy, at a local, regional and national level (e.g. limited procurement).</li> </ul>
Low	1	<ul style="list-style-type: none"> <li>Possible nuisance to human health and well being (e.g. occasional unpleasant odours).</li> <li>Very limited disruption caused to those earning their livings (e.g. no noticeable impact on herding operations).</li> <li>Inconvenience experienced in accessing community facilities and utilities [e.g. electricity supply disruption for short period of time (e.g. hours)].</li> <li>Very limited impact on the wider economy at a local, regional and/or national scale (e.g. no discernable indirect and induced development).</li> </ul>
None	0	<ul style="list-style-type: none"> <li>No impact on human health.</li> <li>No impact on livelihoods.</li> <li>No impact on community facilities/utilities.</li> <li>No impact on the wider economy.</li> </ul>

Category	Ranking	Definition
Limited Positive	+	<ul style="list-style-type: none"> <li>Some beneficial improvement to human health.</li> <li>Benefits to individual livelihoods (e.g. additional employment opportunities).</li> <li>Limited improvements to community facilities/utilities (e.g. no discernable improvement).</li> <li>Some impact on the wider economy (e.g. limited local procurement).</li> </ul>
Modest Positive	++	<ul style="list-style-type: none"> <li>Moderate beneficial improvement to human health.</li> <li>Medium benefits to individual livelihoods (e.g. employment impacts).</li> <li>Improvements to community infrastructure/utilities.</li> <li>Moderate impact on the wider economy (e.g. some local sourcing of supplies).</li> </ul>
Significant Positive	+++	<ul style="list-style-type: none"> <li>Major beneficial improvement to human health.</li> <li>Large scale benefits to individual livelihoods (e.g. large scale employment).</li> <li>Major improvements to community facilities/utilities.</li> <li>Notable impact on the wider economy (e.g. extensive use of local supplies).</li> </ul>

**Table 4.25:** Socio-environmental likelihood of occurrence and rankings for the proposed CuEZL project

Impact Likelihood	Ranking	Definition	Impact Frequency
Almost Certain (80 – 100%)	5	The activity will occur under normal operating conditions.	Very Frequent (High frequency of occurrence – occur more than one per month)
Very Likely (60 - 80%)	4	The activity is very likely to occur under normal operational conditions.	Frequent (Regular frequency. Event likely to occur at least once per year)
Likely (40 - 60%)	3	The activity is likely to occur at some time under normal operating conditions.	Occasional (Occurs once every 1 – 10 years)
Unlikely (20 - 40%)	2	The activity is unlikely to but may occur at some time under normal operating conditions.	Few (Unlikely to occur during life of operations – occurs once every 10 – 100 years)
Very Unlikely (0 - 20%)	1	The activity is very unlikely to occur under normal operating conditions but may occur in exceptional circumstances.	Rare (Highly unlikely to occur during life of the operation. Occurs less than once every 100 years).

### Impact Significance

The significance of socio-economic impact for the proposed CuEZL project is determined by calculating the consequence and likelihood of occurrence of the activity, expressed as follows

$$\text{Significance} = \text{Consequence} \times \text{Likelihood}$$

The above Tables illustrate all possible consequence X likelihood product results for the five consequences and likelihood categories. The possible significance rankings are presented in the following Table 4.26:

**Table 4.26:** Socio-economic Impact significance rankings for the proposed CuEZL project

Ranking (Consequence X Likelihood)	Significance
>16	Critical
9-16	High
6-8	Medium
2-5	Low
<2	Negligible

**Note:** Positive impacts score simply as positive and so cannot be calculated in a similar equation to negative impacts.

Below Table 4.27 illustrates the risk assessment matrix for the proposed CuEZL project.

**Table 4.27:** Risk assessment matrix for the proposed CuEZL project

Likelihood/ Frequency	Consequence severity				
	Low	Minor	Medium	Major	Critical
Almost certain	High	High	Extreme	Extreme	Extreme
Very Likely	Medium	High	High	Extreme	Extreme
Likely	Low	Medium	High	Extreme	Extreme
Unlikely	Low	Low	Medium	High	Extreme
Very Unlikely	Low	Low	Medium	High	High

In below Table 4.28, the potential impacts of the proposed CuEZL project activities on the socio-economic aspects have been ranked on the basis of consequence severity ranking (Table 4.24), likelihood/ frequency ranking (Table 4.25), impact significant ranking (Table 4.26) and risk rating (Table 8.27). Both the “consequence severity” and “risk” of the possible impacts have been categorized as “low”, while likelihood/ frequency” has been categorized as “possible”. Thus, the proposed CuEZL project is not likely to have any significant adverse impact on the existing social environment (except health & safety issues, mobilization to site, and vehicle & cargo-ship movement), if appropriate mitigation measures are adopted.

**Table 4.28:** Summary of Potential Social Impact Assessment (Impact significant = Impact/ Risk Rating) for the proposed CuEZL project

Socio-economic Aspects	Potential Impact (Consequence)	Socio-economic Receptor Type	Description	Consequence severity ranking	Impact likelihood rating	Risk rating
Permitting	Acceptance of proposed CuEZL project and cooperation / participation from local communities, interested parties, and government.	Social	<ul style="list-style-type: none"> <li>• Direct</li> <li>• Negative</li> <li>• Short term</li> <li>• Local</li> <li>• Reversible</li> </ul>	Low	Unlikely	Low
Private agro-wetland acquisition	Acceptance of land owner/ users (legal/ illegal), and cooperation from affected community.	Social & Economic	<ul style="list-style-type: none"> <li>• Direct</li> <li>• Negative</li> <li>• Long term</li> <li>• Local</li> <li>• Reversible</li> </ul>	Low	Unlikely	Low
Loss of private agro-wetland ownership	Acceptance of legal land owner, and cooperation from affected community.	Social & Economic	<ul style="list-style-type: none"> <li>• Same as above</li> </ul>	Low	Unlikely	Low
Hinder of land use	Acceptance of land users (legal/ illegal), & cooperation from affected community.	Social & Economic	<ul style="list-style-type: none"> <li>• Same as above</li> </ul>	Low	Unlikely	Low
Hinder of Fishing & associate activities	Acceptance of fishermen, and cooperation from affected fishermen community.	Social & Economic	<ul style="list-style-type: none"> <li>• Same as above</li> </ul>	Low	Unlikely	Low
Loss of Income	Acceptance of income loss due to implementation of CuEZL project.	Social & Economic	<ul style="list-style-type: none"> <li>• As above</li> </ul>	Low	Unlikely	Low
Traffic congestion (road & river)	Acceptance of fishermen & local communities, and cooperation from affected communities.	Social & Economic	<ul style="list-style-type: none"> <li>• Same as above</li> </ul>	Low	Unlikely	Low
Water Logging	Acceptance of local communities, and cooperation from affected communities.	Social & Economic	<ul style="list-style-type: none"> <li>• Direct</li> <li>• Negative</li> <li>• Short term</li> <li>• Local</li> <li>• Reversible</li> </ul>	Low	Unlikely	Low
Health & Safety issues	Acceptance of local community peoples & project personnel including contractors' staffs, and cooperation from those communities.	Social & Economic	<ul style="list-style-type: none"> <li>• Direct/ Indirect</li> <li>• Negative</li> <li>• Short/ Long term</li> <li>• Local</li> <li>• Reversible/ Irreversible</li> </ul>	Low/ Minor	Likely	Medium
Mobilization to site	Increase in usage of Meghna to Homna road and	Social & Economic	<ul style="list-style-type: none"> <li>• Same as above</li> </ul>	Low/ Minor	Likely	Medium

Socio-economic Aspects	Potential Impact (Consequence)	Socio-economic Receptor Type	Description	Consequence severity ranking	Impact likelihood rating	Risk rating
	Dhaka to Chittagong Highway and Meghna River & Tributaries with possibilities of accidents					
	Increase in usage and resultant damage to existing road and bridge.	Social & Economic	<ul style="list-style-type: none"> <li>• Same as above</li> </ul>	Low	Unlikely	Low
Recruitment of workers and/ or local contractors	Creation of employment opportunities (skill & non-skill)	Social & Economic	<ul style="list-style-type: none"> <li>• Direct / Indirect</li> <li>• Positive</li> <li>• Short/ Long term</li> <li>• Local</li> <li>• Reversible</li> </ul>	Low	Likely	Low
	Third party agitation over contracts, employment issues, community benefits, waste disposal, degradation of water, pressure on water and food.	Social & Economic	<ul style="list-style-type: none"> <li>• Same as above</li> </ul>	Low	Unlikely	Low
Accommodation of workers	Opportunities for contracting, supply of food and other supplies	Social & Economic	<ul style="list-style-type: none"> <li>• Same as above</li> </ul>	Low	Likely	Low
• Land utilization for base camp and economic zone • Site preparation / clearing for base camp, economic zone, & associated activities • Construction of base camp, economic zone, & material storage or placement	Reduction of access to the utilized land and its resources	Social & Economic	<ul style="list-style-type: none"> <li>• Direct</li> <li>• Negative</li> <li>• Short/ Long term</li> <li>• Local</li> <li>• Reversible</li> </ul>	Low	Unlikely	Low
	Attack of workers and community members by bees, scorpions, spiders / other wildlife, and contact with thorn / poisonous plants.	Social & Economic	<ul style="list-style-type: none"> <li>• Same as above</li> </ul>	Low	Unlikely	Low
	Pressure on available water for domestic and other uses	Social & Economic	<ul style="list-style-type: none"> <li>• Same as above</li> </ul>	Low	Unlikely	Low
• Excavation & associate activities • Repairs & maintenance: (e.g. motor vehicle repairs, maintenance of facilities, etc.)	<ul style="list-style-type: none"> <li>• Generation of high intensity noise &amp; vibration.</li> <li>• Burns and injuries from other maintenance activities.</li> </ul>	Social & Economic	<ul style="list-style-type: none"> <li>• Same as above</li> </ul>	Low	Unlikely	Low
	Contamination of surface soil/ water with used lubricant, if any.	Social & Economic	<ul style="list-style-type: none"> <li>• Same as above</li> </ul>	Low	Unlikely	Low
Vehicle and cargo-ship movement	<ul style="list-style-type: none"> <li>• Probability of accident during transportation of goods through Meghna-Homna road and Dhaka to Chittagong Highway as well as Meghna river &amp; Tributaries</li> <li>• Nuisance noise, dust, emissions, lighting, etc.</li> </ul>	Social & Economic	<ul style="list-style-type: none"> <li>• Direct</li> <li>• Negative</li> <li>• Short/long term</li> <li>• Local</li> <li>• Reversible/</li> </ul>	Medium	Unlikely	Medium

Socio-economic Aspects	Potential Impact (Consequence)	Socio-economic Receptor Type	Description	Consequence severity ranking	Impact likelihood rating	Risk rating
			irreversible			
Water quality deterioration	Water contamination due to project related activities (e.g. waste deposit or sewer discharge to the nearby river or wetlands, etc.).	Social & Economic	<ul style="list-style-type: none"> <li>• Direct</li> <li>• Negative</li> <li>• Short/ Long term</li> <li>• Local</li> <li>• Reversible</li> </ul>	Low	Unlikely	Low
Exhaust from generators	Disturbance to local community & road side moving people, etc.	Social & Economic	<ul style="list-style-type: none"> <li>• Same as above</li> </ul>	Minor	Unlikely	Low
Spills (oil / chemical) on land or water	Soil or water contamination/ disturbance to local community.	Social & Economic	<ul style="list-style-type: none"> <li>• Same as above</li> </ul>	Minor	Unlikely	Low
Waste generation: (solid/ liquid/ gaseous) (e.g. cement bags, exhaust from cranes/ heavy equipment, domestic waste, etc).	• Impairment of the health of local community. • Increase in disease conditions like diarrhea / respiratory tract diseases, etc.	Social & Economic	<ul style="list-style-type: none"> <li>• Same as above</li> </ul>	Minor	Unlikely	Low
	Increased level of disease vectors (mosquitoes, rats, flies, etc).	Social & Economic	<ul style="list-style-type: none"> <li>• Same as above</li> </ul>	Minor	Unlikely	Low
	Water and soil contamination due to sewage discharge (e.g. increase in water borne diseases).	Social & Economic	<ul style="list-style-type: none"> <li>• Same as above</li> </ul>	Minor	Unlikely	Low
Decommissioning • Repair of damaged road. • Removal of structures • Restoration of site etc.	Increased opportunity for employment and contracting resulting in increased income level.	Social & Economic	<ul style="list-style-type: none"> <li>• Same as above</li> </ul>	Minor	Possible	Low

The above table indicates that most of the socio-economic impacts are rated as low except (a) Health and Safety issues, (b) Mobilization to site, and (c) vehicle & cargo-ship movement – all of these are rated as medium impacts; No long-term adverse impacts to the overall local community are expected. However, socio-economic Impacts mitigation measures for social environment of the proposed CuEVL project have been described in the relevant chapter of this report.

#### **4.11 Social Auditing**

As mentioned earlier, the CuEVL is not functional yet. Construction work of the administrative building, Meghna Re-Rolling Steel Industry and Meghna Glass Industry is currently ongoing. Therefore, no social auditing campaign could be conducted. However, a sampling protocol and data collection scheme along with the questionnaire is provided in Annex E. Once the industries of the CuEVL becomes operational these may be used to conduct the social auditing campaign. A construction audit is conducted to check the construction activities (Annex F). It has been found that, 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 (construction materials, admixture) storage areas. 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.).

## **Chapter 5**

### **ANALYSIS OF ALTERNATIVES**

#### **5.1. General**

The Bangladesh Economic Zone Act, 2010 opened a new window and allows private sector to own, develop and manage economic zones and establish infrastructure and services for the companies. While Economic Zones (EZs) benefit from streamlined processes and higher attention of administrative authorities, the main rationale for the establishment of EZ is the existence of locally vibrant commercial entities that could with limited support become world-class centers of excellence.

#### **5.2. Alternative Location**

Cumilla Economic Zone (CuEZ) is located south of Meghna Bridge, abutted by the Meghna-Homna road in Meghna Upazila. The zone is only 600 Meters from the Dhaka-Chittagong highway and four and half Kilometer from the Meghna Bridge. Most of the interested investors would find it very much feasible and accessible with respect to location. The geographical setting of the zone has added value to it. The zone is located close to the bank of one of the branches of the Meghna River which is a great inceptor to the zone for water demand as well as for transportation adding to the positive aspects sought by the investors. The economic zone is being developed which would attract the interest of the respondents as setting and operation of industry would require less effort. Since the proposed economic zone will have CETP, STP and WTP, the wastewater generated in the industries will be treated to national standards before discharging into the Meghna river branch. The wastewater at each industrial unit will be pre-treated as required by law to the intake standards for the CETP. Hence, it is not likely to cause an adverse impact on terrestrial biodiversity as well as aquatic fisheries values. The proposed location is close to the river due to its nature of business. The land is owned by Cumilla Economic Zone Ltd (purchased different times and some a long time back) and earmarked for EZ development through a gazette publication by BEZA. The legacy issues of land acquisition for compliance with WB requirements have also been resolved. If any issue emerges in the future, it will also be amicably addressed by CuEZL. The proposed site is above the 50 years' flood level and it is suitable for the construction of the Project. Thus, selection of the site for the CuEZL is quite appropriate and advantageous compared to other locations.

#### **5.3. No Project Scenario**

The recent COVID-19 pandemic has adversely affected the GDP growth rate. The GDP growth was 3.51% in the year 2020, whereas a steady growth rate of 7-8% was achieved in the several previous years. Achieving the growth rate of 7-8 percent per year will require more investment, FDI and Export. Investment as a proportion of GDP has been hovering around 28 percent for the last five years. In order to achieve growth rate of 8 percent, investment to GDP ratio needs to increase from 29 percent to 35 percent. Public investment has been on rise in the recent years, though private investment (which is instrumental in attaining higher growth rates) seems to be

more or less static. This can be addressed by attracting investment in the Private Economic Zones which offers incentives such as Tax Holiday, VAT Exemption, Subsidy, Exemption from Custom Duty, etc. Therefore, if Private Economic Zones such as CuEZL will not be established then the national target economic growth will not be achieved.

Implementation of the proposed Project will create a lot of positive impacts on investment, employment, indirect source of income, education, and socio-economic status of the community as well. Provision of good quality facilities will help to enhance the quality of life of the people. The Project will help to create job opportunities for a considerable number of people. In the absence of the project, the region will be deprived of the potential for increased production, generation of new economic activities and employment.

## Chapter 6

### PUBLIC CONSULTATION AND COMMUNICATION

#### 6.1 Introduction

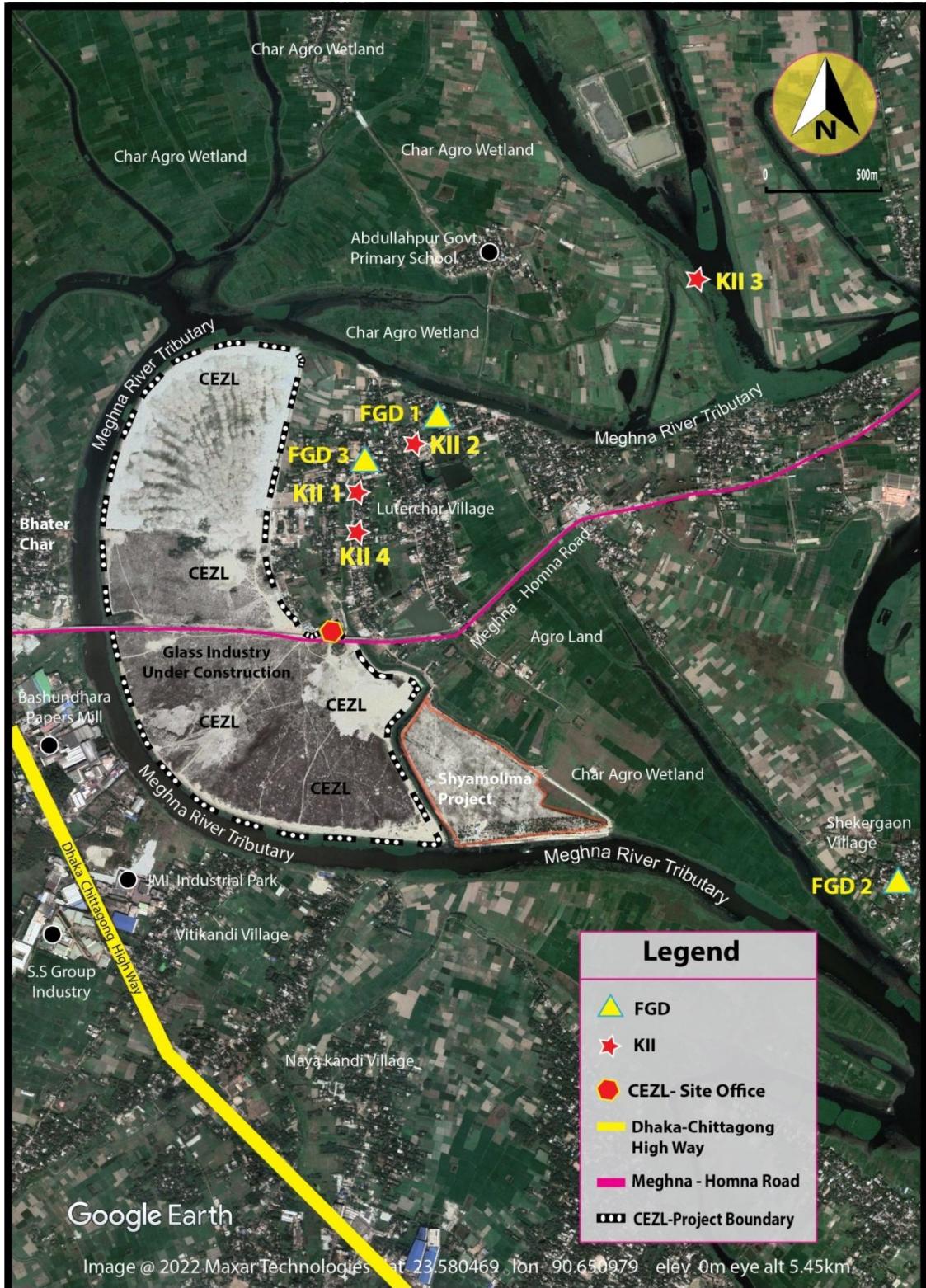
A total of three public consultation sessions and four Key Informant Interviews (KII) have been organized for the proposed ‘Cumilla Economic Zone Limited (CuEZL)’ project of Meghna Group of Industries (MGI). The public consultation, in the form of Focus Group Discussion (FGD), were conducted in the public places, adjacent to the proposed CuEZL project site, and Key Informant Interviews (KII) were organized in the respective informant’s offices/ institutions. Major stakeholders as well as local people participated in the FGD sessions provided their views, opinions and concerns regarding the proposed CuEZL project and its impact on them and local environment. Major findings of the FGD sessions, KII sessions and meetings are summarized below.

#### 6.2 Approach and Methodology

The FGD sessions were organized in three important public places, adjacent to the proposed CuEZL project site in September 19-20, 2022 (Figure 6.1). The locations were (1) Luterchar Union Parishad Office, Meghna Upazila, (ii) Shekhergaon A. W. Munshi High School, Luterchar Union, Meghna Upazila, and (iii) Mafizul Islam High School, Luterchar Union, Meghna Upazila, Cumilla District, Bangladesh. Around 100 people participated in the FGD sessions (Table 6.1). In the FGD sessions, an effort was made to invite a wide range of stakeholders including Union Parishad (UP) chairman and Members, fishermen, farmers, villagers, religious leaders, politicians, businessmen, traders, land owners, house owners, laborers, teachers, doctors, private service holders, government service holders, women, student, etc. (Figure 6.2). In addition to the FGD sessions, some informal and formal meetings with local stakeholders were carried out, adjacent to the proposed CuEZL project site. The team interacted with more than twelve people during these meetings.

**Table 6.1:** Details of FGD sessions for the proposed CuEZL project of MGI

SL.No.	Venue	Date and Time	Number of Participants
FGD 01	Luterchar Union Parishad Office, Meghna Upazila, Cumilla District.	19 – 09 – 2022 11.00 am – 12.00 pm	36
FGD 02	Shekhergaon A. W. M. High School, Luterchar Union, Meghna Upazila, Cumilla District.	19 – 09 – 2022 04.00 pm – 05.00 pm	32
FGD 03	Mafizul Islam High School, Luterchar Union, Meghna Upazila, Cumilla District, Bangladesh.	20 – 09 – 2022 11.00 am – 12.00 pm	28
<b>Total</b>			<b>96</b>



**Figure 6.1:** Locations of Focus Group Discussion (FGD) sessions and KII sessions for the proposed CuEZL.



(a)



(b)



(c)



(d)



(e)



(f)

**Figure 6.2:** Focus Group Discussion (FGD) sessions in the presence of CuEZL staff, Upazila & Union Parishad Chairman's, local leaders of various organizations, village people, farmer, fishermen, businessmen, etc.: Photo (a) and (b) represent the first FGD session at Luterchar Union Parishad Office, Meghna Upazila; Photo (c) and (d) represents the second FGD session at Shekhergaon A. W. Munshi High School, Luterchar Union, Meghna Upazila; and Photo (e) and (f) represent the third FGD session at Mafizul Islam High School, Luterchar Union, Meghna Upazila, Cumilla District, Bangladesh.

### **6.3 Key Findings from FGD Sessions and Meetings**

In the FGD sessions the participants expressed their opinions and concerns regarding the different issues including their knowledge about the proposed CuEZL project, physical and ecological environment, and also socio-economic condition of people in their localities, possible impact of the proposed project on the existing local environment and in their lives and livelihood, and also suggested mitigation measures to address the adverse impacts. The major findings of the FGD sessions and meetings are summarized below:

#### **(i) General Opinion on the proposed CuEZL project**

- Most participants liked to know the name, types and number of industries to be installed at CuEZL. Thus, more information needs to be disseminated to the local community on the project and related issues.
- It is the expectation of some participants that the proposed CuEZL project will improve the local economic condition during the construction phase as well as operational phase.
- Some participants thought that the proposed CuEZL project will create new business opportunity as well as new employment for the local people.
- Some participants suggested that the proposed CuEZL project should allow only green category industries to be established.
- Participants expressed that dredging might be needed to widen the river/ tributaries, adjacent to the proposed CuEZL project site for large cargo vessels.
- Participants expected that villagers will be benefitted by renting their properties to outsiders/workers of CuEZL project.

#### **(ii) Opinion on possible impacts of the proposed CuEZL project**

- A rural road from the village to the river has been closed when the boundary wall of the CuEZL was constructed. This was an important path for the villagers, therefore, alternative road need to be constructed by CuEZL authority to alleviate the problems of the villagers.
- The present population of Luterchar Union is about 20,000 and is ill-equipped to handle the anticipated increase in population of approximately 50,000 when the CuEZL is in full operation.
- Local environment has already been changed drastically due to sand-filling which has irreversibly affected the ecology of the area.
- Disposal of untreated and/or partially treated effluent in the surface water bodies may deteriorate the water quality.
- Fishermen community (30%) was temporarily impacted during dredging introduced turbidity, which has now been resolved with the end of dredging activities. The river water quality should be monitored regularly in the operation phase to ensure that the river water quality remains suitable for fish survival complying the standards.
- Temperature will be increased for establishment of re-rolling industry and other red category related industries; those industries will pollute the air, water and soil as well as create noise disturbance to the local community.

- Ground-water is used primarily for drinking and other household purposes; local people collect ground-water from about 750 feet depth; Water is also available in shallow aquifers which are recharged through riverbank infiltration.
- Water logging occurs during rainy season in the existing Meghna to Homna road and nearby areas; it may enhance for the proposed CuEZL project activities, if appropriate mitigation measures are not taken at specific water logging areas.
- Village environment will be changed as semi-urban environment; hence, local people will not hear the birds singing, especially in the morning, due to the CuEZL project activities.

**(iii) Expectation of people from the proposed ‘Cumilla Economic Zone Limited’ project**

- Ensure local employment (40% to 50%) in the proposed CuEZL project as per their qualification (skill and non-skill) as well as provision of honorarium as per local market rate. Quota should be kept for each PAP family for one to two jobs.
- Prioritize fishermen and fishing community people’s livelihood restoration issue. This should not only be limited to training but also ensuring engagement of alternative jobs.
- Ensure waste and sewerage management issues as per national standard during construction and operation of the proposed CuEZL project.
- Ensure proper drainage system to keep good condition of the proposed CuEZL, and local community areas from water logging and associate problems.
- Ensure establishment of effluent treatment plant (ETP) and solid and gaseous waste management system, as per international standard, for all industry that will be established at CuEZL project site.
- Ensure no pollution commitment for the river water or tributaries; also ensure water quality as per national standard by preventing water pollution from CuEZL project activities; otherwise fish population will be decreased in the river and tributaries as well as local community will not be able to use the pure river/ tributary water for their domestic use.
- Ensure to establish a central playground for the local community; it may be used for Eid-jamat/ prayer during Eid-festival; Playground generally helps the young people to play games, and thus, they can be kept-away from anti-social activities including addiction to narcotic substances. .
- Ensure local community access/ link in the sewerage system and natural gas supply network of the proposed CuEZL project plan.
- Ensure widening of the existing local road and bridge for easy movement of large vehicles as well as to prevent accident; an alternative road for the villagers will help to reduce accident.
- Ensure to establish a new higher educational institution/ college/ university and access of local student for higher education.
- Ensure to establish a new central mosque in an appropriate place, and allow access of local people there for prayer.
- Ensure to provide fund from CSR of MGI for construction of a central hospital as well as local community access to get medical facilities.
- Ensure green belt through native tree plantation program, surrounding the CuEZL project site.

- Ensure to establish a green entertainment area for villagers as well as CuEZL project personnel's.

#### 6.4 Key Findings from KII Sessions

A total of four Key Informant Interviews (KII) have been organized with four respected and important individuals who may help to identify some potential impacts and suggest mitigation measures, as well as to advise on probable challenges with mitigations for the proposed CuEZL project, based on their experience with similar types of project. Summary of those KII sessions are given below:



(a)



(b)



(c)



(d)

**Figure 6.3:** Key Informant Interview (KII) sessions with local stakeholders: (a) Mahbubullah Sikder, Businessman and Local Leader, Luterchar Union, Meghna Upazila, (b) Md. Abdul Manna, Head Master, South Luterchar Govt. Primary School (61 no), Meghna Upazila, (c) Mamunur Rashid, Imam and Khatib, Luterchar High School Central Mosque, Meghna Upazila, and (d) Prodip Sarker, Fisherman Leader, Mohammadpur More, Luterchar Union, Meghna Upazila, Cumilla District, Bangladesh.

##### (a) **Mahbubullah Sikder**

Businessman and Local Leader  
Luterchar Union, Meghna Upazila,

Cumilla District, Bangladesh.

- Know about the proposed ‘Cumilla Economic Zone Limited’ project of MGI who will build-up the economic zone beside a tributary of Meghna River at their locality.
- Involvement possible
  - As an engineer as well as socially and politically
  - Could help to resolve local problems, if MGI involves him.
  - Could supply construction materials with cheap rate.
- Probable challenges are as follows:
  - Not enough and wide road exist to transport the materials to the proposed CuEVL site.
  - Without effluent treatment plant (ETP), local community will not allow to operate the industry that will be established in future.
  - Control of air pollution from the project site, which already been enhanced the air-borne diseases. Local people are suffering now.
- Probable Mitigation measures are as follows:
  - Ensure widen of existing Meghan to Homna road to 120 feet wide road
  - Ensure an exclusive road for the CuEVL project.
  - Ensure regular discussion with local leader for the challenging issues.
  - Ensure local peoples involvement with CuEVL project activities.
  - Ensure ETP for all industry, to save the local environment including river/ tributaries from industrial pollution.
  - Ensure non-establishment of air pollution causing industry in the CuEVL project site.
  - Ensure piped gas line for the CuEVL project.
  - Ensure plantation program with native flora species.

**(b) Md. Abdul Manna**

Head Master  
South Luterchar Govt. Primary School (61 no)  
Meghna Upazila, Cumilla District, Bangladesh

- Know about the proposed ‘Cumilla Economic Zone Limited’ project of MGI who will build-up the economic zone at their locality.
- Involvement possible
  - As a teacher, future CuEVL School – if any, inside the CuEVL project site.
  - As an official for the relevant office work of CuEVL project.
  - After receiving the relevant information on CuEVL project, he himself and his student will help to disseminate that info to the local community.
- Probable challenges are as follows:
  - Not enough roads, for transportation of materials to the project site.
  - No gas & gas line available, for industrial use.

- Probable Mitigation measures are as follows:
  - Ensure wide new road for CuEZL project site.
  - Ensure availability of gas and water for industrial use.

**(c) Mamunur Rashid**

Imam / Religious Leader  
Luterchar High School Central Mosque  
Meghna Upazila, Cumilla District, Bangladesh

- Know about the proposed ‘Cumilla Economic Zone Limited’ project of MGI who will build-up the economic zone at their locality.
- Involvement possible
  - As an Imam for the proposed CuEZL project central mosque.
  - Help to solve religious issue within the CuEZL project site.
- Probable challenges are as follows
  - Wide road does not exist for transportation of heavy industrial vehicle and materials.
- Probable Mitigation measures are as follows
  - Ensure construction of wide and strong road for movement of industrial vehicles with materials.

**(d) Prodip Sarker**

Fisherman Leader  
Mohammadpur More, Luterchar Union  
Meghna Upazila, Cumilla District, Bangladesh

- Does not know about the proposed CuEZL project; only know that rich people / businessman will construct the area either as for industry or making residential plot for human settlement.
- Involvement not possible
  - As he/ his community does practice fishing in the Meghna River and its tributaries.
  - Not have skill/ experience to work in any industry.
- Probable challenges are as follows
  - Disturbance/ interference of cargo ship movement in the Meghna River tributary due to the existence of fishing net and/ or fishing activities.
  - Pollution from industries may negatively impact the aquatic system. Appropriate treatment scheme shall be adopted to reduce pollution loads (i.e., through STP, ETP at individual plants and CETP), so that the impact on aquatic system is minimal with water quality remaining suitable for fish survival as per standard.
- Probable Mitigation measures are as follows

- Ensure cargo ship movement in specific route and line, without hassle/ collision, within the river/ tributary.
- Ensure regular consultation with local fishermen/ community regarding cargo ship movement and associated issues.

## **6.5 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 19<sup>th</sup> June, 2021. The meeting was led by Mr. Kartik 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 MGI authority for CuEZL 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 fair and 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, process of land procurement, some certified copies of land deed, payment documents, consultation meeting with land owners and its attendees are provided in Annex H.

# **Chapter 7**

## **ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN**

### **7.1 Introduction**

The Environmental and Social Management Plan (ESMP) outlines the mitigation and abatement measures that should be undertaken during pre-construction, construction, and operation phases of the project to eliminate or offset the adverse environmental and social impacts due to the various project activities or reduce them to acceptable levels.

ESMP includes monitoring plan to assess the effectiveness of mitigation measures employed. It also describes the actions needed and institutional and financial support for the proper implementation of proposed mitigation measures.

In Cumilla Economic Zone Limited (CuEZL), presently construction of administration building is ongoing. There is no industry which is in full operational condition at this moment and two are being constructed (Table 7.4). Therefore, in this economic zone, only construction process is going on. The ESIA team has conducted environmental auditing for the ongoing construction activities and the findings are presented in Annex F. The ESIA team has also formulated Environmental Auditing Guidelines for the new industries and this has been presented in Annex E.

### **7.2 Mitigation Measures for Environmental, Ecological and Social Impacts**

The CuEZL project involves a series of activities such as construction of internal roads, industrial buildings, supporting office buildings and other amenities and finally the operational process for the finished products. All these activities are associated with a number of environmental impacts which are already identified and evaluated in Chapter 4. The following subsections present the mitigation measures to minimize those impacts along with their responsibilities for their implementation.

#### **7.2.1 Mitigation Measures during Pre-Construction Phase**

The land filling work for the economic zone has long been completed. Therefore, many impacts from pre-construction activities (activities related to site preparation such as sand dredging and sand filling, storage of dredge spoil) are not relevant at this stage. However, there are long-term impacts due to change of land-use and filling up of the waterbody, ditch, and depression. Table 7.1 presents the mitigation measures along with the implementation responsibility to be adopted to minimize the adverse impacts associated with land-use changes.

**Table 7.1: Mitigation Measures for Potential Adverse Impacts during Pre-Construction Phase**

Activity/Issues	Impacts/Potential impacts	Proposed mitigation and enhancement measures	Responsible parties
<b>Pre-Construction Stage (location and design stage)</b>			
Sand dredging from the nearby river for land filling	<ul style="list-style-type: none"> <li>● Disturbance of Aquatic ecosystem</li> <li>● River water turbidity increase and can impede the photosynthesis of aquatic plants</li> <li>● Impact on Fish resources including benthic species will be affected</li> <li>● Chances of river bank erosion</li> </ul>	<ul style="list-style-type: none"> <li>● Dredging was done in a controlled way and to be minimize the impact.</li> <li>● </li> </ul>	Contractor, (Monitoring by CuEZL's nominated personnel)
Development of project land area by sand filling	<ul style="list-style-type: none"> <li>● Loss of previously existing water storage basin and chances of water logging in the surround areas</li> <li>● Obstruction of natural drainage</li> </ul>	<ul style="list-style-type: none"> <li>● Ensure proper drainage system in the project area</li> <li>● Minimize the water logging problem in the surrounding areas by constructing drainage channels</li> <li>● Increase the height of the roads above the 50-year flood level.</li> </ul>	Contractor (Monitoring by CuEZL's nominated personnel)
Long term storage of dredge spoil in the project area and its disposal	<ul style="list-style-type: none"> <li>● Alteration of topography, geology and soil quality</li> </ul>	<ul style="list-style-type: none"> <li>● Slopes and drainage system must be designed to prevent erosion. Slopes longer than 200 feet should be interrupted with drainage ways. Final cover of the filled areas must consist of at least 18 inches of soil with the top 12 inches capable of sustaining vegetative growth. Final slopes for the fill area must be within 2%-20% and shall be consistent with the planned ultimate use for the site. Final cover must consist of at least 18 inches of soil with the top 12 inches capable of sustaining vegetative growth.</li> </ul>	Contractor (Monitoring by CuEZL's nominated personnel)
Surface runoff of dredge materials	<ul style="list-style-type: none"> <li>● Water quality (GW &amp; SW) may deteriorate</li> <li>● Soil quality may change</li> </ul>	<ul style="list-style-type: none"> <li>● Dredge materials were managed and the short-term impact on water quality (e.g., increased turbidity) disappeared after sometime.</li> <li>● Original soil quality has changed due to dredged over burden</li> </ul>	Contractor (Monitoring by CuEZL's nominated personnel)

<b>Activity/Issues</b>	<b>Impacts/Potential impacts</b>	<b>Proposed mitigation and enhancement measures</b>	<b>Responsible parties</b>
<b>Pre-Construction Stage (location and design stage)</b>			
		<p>materials, which should be properly contained in covered condition within the project area as explained already.</p> <ul style="list-style-type: none"> <li>●</li> </ul>	personnel)
Land clearing, cutting trees and filling up of the waterbody, ditch and depression	<ul style="list-style-type: none"> <li>● Loss of terrestrial ecosystem</li> <li>● Loss of aquatic biota</li> </ul>	<ul style="list-style-type: none"> <li>● Land clearing or cutting of trees were not required as land involved were agricultural. Undergrowth of new trees and shrub in the filled area should be allowed to grow naturally after land development, as these are the prime habitats for local mammals, reptiles, etc.</li> <li>● Sufficient time should be allowed for mammals to move from one place to another</li> <li>● Project activities should be restricted during the breeding seasons of reptiles, mammals, etc.</li> <li>● Aquatic reservoirs used by amphibians should not be contaminated by depositing dredge materials, oil or any other chemicals</li> <li>● Planting of trees</li> <li>● As per BEZA rule, at least 5% area of CuEZL should be kept as open greenery and wetland area to restore the previous ecological environment.</li> </ul>	Contractor (Monitoring by CuEZL's nominated personnel, CuEZL can hire an ecological restoration expert)
Change of land use	<ul style="list-style-type: none"> <li>● Loss of crops</li> <li>● Loss of grazing land</li> </ul>	<ul style="list-style-type: none"> <li>● Early communication with the project affected people were done to minimize the potential conflict.</li> <li>● Proper compensation should be ensured for livelihood loss, and deliberation on the should be continued if any issue comes up and these should be amicably solved.</li> </ul>	CuEZL
Employment	<ul style="list-style-type: none"> <li>● Effects positively in local people's income generation</li> </ul>	<ul style="list-style-type: none"> <li>● Employ workers from the local community if appropriate skilled workers are available.</li> </ul>	Contractor (Monitoring by CuEZL's nominated personnel)

## 7.2.2 Mitigation Measures during Construction phase

**Table 7.2** presents the mitigation measures along with the implementation responsibility to be adopted during the construction stage. The measures presented in **Table 7.2** are aimed at minimizing the effects of the possible adverse impacts and enhancing the positive impacts. The table shows that most of the adverse impacts could be minimized or even removed if appropriate mitigation measures are taken.

**Table 7.2: Mitigation measures during Construction phase**

Activity/Issues	Potential impacts	Proposed mitigation and enhancement measures	Responsible parties
Excavation for infrastructure construction and generation of excavated materials and construction wastes	<ul style="list-style-type: none"> <li>● Chances of soil collapse</li> <li>● Soil contamination</li> <li>● Drainage congestion</li> </ul>	<ul style="list-style-type: none"> <li>● Proper care should be taken to protect from cave-in.</li> <li>● All solid wastes should be appropriately disposed of in drums or dumpsters in a designated place within the project area.</li> <li>● Stacking and disposal of such material should not disturb the surrounding land use. No wastes shall be disposed of into waterways, their beds, or in immediate proximity to them. Neither shall any waste be dumped into wetlands and flood plains.</li> <li>● Wastes should be disposed of at the designated and properly designed disposal site identified and approved by the authority.</li> </ul>	Contractor (Monitored by CuEZL's nominated personnel)
Hydrology and water resources impact	<ul style="list-style-type: none"> <li>● Increased surface run-off, because of increased paved surfaces resulting in possible flooding in nearby areas</li> </ul>	<ul style="list-style-type: none"> <li>● A site-specific drainage plan should be prepared first.</li> <li>● Storm water should be managed for surface runoff controls by constructing site drainage system.</li> <li>● Drainage diversion structures should be built to allow cross drainage within the site.</li> </ul>	Contractor (Monitored by CuEZL's nominated personnel)
Impact on Air Quality	<ul style="list-style-type: none"> <li>● Dust generation</li> <li>● Gaseous emissions</li> <li>● Causes various respiratory diseases</li> </ul>	<ul style="list-style-type: none"> <li>● All loose material, either stacked or transported, shall be kept on site for the shortest possible time and provided with suitable covering, such as tarpaulin</li> <li>● Water sprinkling shall be done at the location where dust generation is anticipated</li> <li>● To minimize the occupational health hazard, proper personal protective gears i.e., dust masks shall be provided to the workers</li> <li>● To control vehicular emissions, all motor vehicles and/or construction equipment shall comply with all pertinent National regulations relative to exhaust emission controls and safety</li> </ul>	Contractor (Monitored by CuEZL's nominated personnel)

<b>Activity/Issues</b>	<b>Potential impacts</b>	<b>Proposed mitigation and enhancement measures</b>	<b>Responsible parties</b>
		<ul style="list-style-type: none"> <li>The reduction of emissions of SO<sub>X</sub>, NO<sub>X</sub>, CO, hydrocarbons (HC), and particulate matter (PM<sub>2.5</sub>, PM<sub>10</sub>) will be accomplished by installing Retrofit Emission Control Devices or by using less polluting clean fuels</li> </ul>	
Noise pollution	<ul style="list-style-type: none"> <li>Causes nuisance in the project area and nearby settlements</li> <li>Causes headache, discomfort, etc.</li> <li>Excessive noise and vibration affect burrowing animals within the project site and project influence areas</li> </ul>	<ul style="list-style-type: none"> <li>Silencers and mufflers should be affixed to the exhaust systems of all mechanical engines/equipment being used at the project site</li> <li>Avoid using of construction equipment producing excessive noise during school hours and at night</li> <li>Isolation of the source and sensitive receptors during the construction phase should be undertaken to minimize the impacts of noise and vibration</li> <li>To prevent any occupational hazard, ear muffs/ ear plugs shall be provided to the workers working around or operating plant and machinery emitting high noise levels</li> <li>Noise level and vibration should be kept at minimum</li> </ul>	Contractor (Monitored by CuEZL's nominated personnel)
Traffic congestion	<ul style="list-style-type: none"> <li>Increase in local traffic and thereby possible creation of traffic jam</li> <li>Communication problem</li> </ul>	<ul style="list-style-type: none"> <li>Schedule deliveries of material/ equipment during off-peak time</li> <li>Arrange for regulation of traffic movement during project construction along affected roads</li> <li>Employ flagman, slow down traffic, and provide adequate signs/ lights for traffic management and to avoid accidents; take assistance from police, where appropriate, for traffic control/ security</li> </ul>	Contractor (Monitored by CuEZL's nominated personnel)
Water pollution	<ul style="list-style-type: none"> <li>Soil contamination and Groundwater contamination</li> </ul>	<ul style="list-style-type: none"> <li>During the construction phase, run-off from the site will not be allowed to stand (water logging) or enter directly into the roadside drains. In order to reduce runoff contamination to ground water, sediment and grease traps should be used to intercept run-off from drainage areas</li> </ul>	Contractor (Monitored by CuEZL's nominated personnel)
Sanitation and solid waste	<ul style="list-style-type: none"> <li>Generation of sewage and solid waste</li> <li>Generation of hazardous wastes</li> <li>Health of workers</li> </ul>	<ul style="list-style-type: none"> <li>Strategically located and maintained portable latrine facilities (popularly known as Porta-Cabin) must be made available for construction workers</li> <li>Adequate number of separate collection bins for biodegradable and non-biodegradable waste shall be provided. Waste from such containers shall be collected separately on a daily basis</li> </ul>	Contractor (Monitored by CuEZL's nominated personnel)

<b>Activity/Issues</b>	<b>Potential impacts</b>	<b>Proposed mitigation and enhancement measures</b>	<b>Responsible parties</b>
		<ul style="list-style-type: none"> <li>● Erection of “no litter” sign</li> <li>● Waste minimization, recycle and reuse principles to be followed</li> <li>● Arrangements will be made with the local municipality for the provision of a central garbage station or transfer point, from where all wastes collected from collection bins shall be disposed of for further disposal by the municipal authorities or any designated third party.</li> <li>● Special arrangements should be made for safe disposal of hazardous materials like paint residues, solvents, diesel fuel, etc.</li> <li>● Clean bill of health should be made a mandatory condition for employment</li> <li>● Raising awareness about hygiene practices among workers</li> <li>● Regular medical monitoring of workers</li> </ul>	
Safety hazard	<ul style="list-style-type: none"> <li>● Risk of accidents, injuries</li> </ul>	<ul style="list-style-type: none"> <li>● Take adequate measures to ensure safety/ stability of structures</li> <li>● Follow standard safety protocols.</li> <li>● Provision of protective gears (PPE) (e.g., uniform, helmet, boots etc.) and first aid facilities.</li> </ul>	Contractor (Monitored by CuEZL's nominated personnel)
Employment opportunity	<ul style="list-style-type: none"> <li>● Employment of work/ labor force/ economy of the area</li> </ul>	<ul style="list-style-type: none"> <li>● Employ local people in the project activities as much as possible.</li> <li>● Promote supply from local suppliers</li> </ul>	Contractor (Monitored by CuEZL's)

### 7.2.3 Mitigation Measures during Operation phase

Table 7.3 presents the mitigation measures along with the implementation responsibility to be adopted during operational phase of CuEZL. The measures presented in Table 7.3 are aimed at minimizing the effects of the possible adverse impacts and enhancing the positive impacts.

**Table 7.3: Mitigation measures during Operation phase**

Activity/Issues	Potential impacts	Proposed mitigation and enhancement measures	Responsible parties
Ground water resources	<ul style="list-style-type: none"> <li>Chances of reduction of ground water due to extraction of large amount of groundwater for industrial use (beverage and food processing industry)</li> </ul>	<ul style="list-style-type: none"> <li>Continuous monitoring of groundwater table by installing piezometer equipped monitoring well with pressure transducer within the project area</li> </ul>	Monitored by CuEZL's nominated personnel
Surface Water Quality	<ul style="list-style-type: none"> <li>Deterioration of nearby river water quality due to discharge of industrial effluent, storm, and domestic wastewater</li> </ul>	<ul style="list-style-type: none"> <li>Contaminated wastewater generating industries should have their own ETP</li> <li>Effective functioning of ETP/CETP/STP and comply with the national standards (ECR, 2023)</li> </ul>	Monitored by CuEZL's nominated personnel
Solid waste	<ul style="list-style-type: none"> <li>Generation of solid waste from industrial processes and domestic sources</li> <li>Generation of hazardous wastes</li> <li>May pollute environment and affect health of workers</li> </ul>	<ul style="list-style-type: none"> <li><b>STS (Secondary Transfer Station) for temporary storage of solid wastes or a full TSDF(Treatment, Storage, and Disposal Facility) should be made operational early in the project. This may be located inside or outside of the zone depending on land availability.</b></li> <li>Adequate number of separate collection bins for biodegradable and non-biodegradable waste shall be provided. Waste from such containers shall be collected separately on a daily basis and transferred to STS/TSDF.</li> <li>Erection of “no litter” sign</li> <li>Waste minimization, recycle and reuse principles to be followed</li> <li>Solid wastes will be managed through CuEZL's own purpose-built STS/ TSDF. Special arrangements should be made for safe disposal of hazardous materials like waste oil, used oil, oily sludge, Sludge from treatment plants, discarded containers of chemicals, expired or discarded chemicals and products, ash</li> </ul>	Individual industry and monitored by CuEZL's nominated personnel

<b>Activity/Issues</b>	<b>Potential impacts</b>	<b>Proposed mitigation and enhancement measures</b>	<b>Responsible parties</b>
		<p>from waste incineration, contaminated filters and centrifuge bags, spent activated carbon and catalysts, Dust/particulate (containing Arsenic) from exhaust gas treatment among others.</p> <p>Raising awareness about hygiene practices among workers</p> <ul style="list-style-type: none"> <li>● Regular medical check-up for workers</li> </ul>	
Noise pollution	<ul style="list-style-type: none"> <li>● Generation of high level of noise from machineries, vehicles which may affect workers' health within the industries and cause nuisance to the surroundings environment</li> <li>● Excessive noise and vibration affect burrowing animals within the project site and project influence areas</li> </ul>	<ul style="list-style-type: none"> <li>● All the equipment to be used should be designed to have a noise level not exceeding 70 dBA as per the requirement of ECR 2023 at the factory gate.</li> <li>● In order to control noise pollution, Diesel Generator sets, pumps, boiler shall be housed in approved respective factory manufactured acoustic enclosures/canopies.</li> <li>● Employees working close to noise sources and exposed to occupational sound exposure should be required to practice hearing conservation habits, as is necessary (such as wearing adequate protective measures in the form of ear muffs and earplugs).</li> <li>● Discourage unnecessary honking within the complex.</li> <li>● Noise level and vibration should be kept minimum.</li> </ul>	Individual Industry and CuEVL's nominated personnel
Air quality	<p>Poor air quality due to:</p> <ul style="list-style-type: none"> <li>● Vehicular emission (SO<sub>X</sub>, NO<sub>X</sub>, CO<sub>X</sub>, HC)</li> <li>● Emission from different machineries used in the industries</li> <li>● Fumes of paints, solvent deteriorate air quality</li> </ul>	<ul style="list-style-type: none"> <li>● Proper maintenance of the internal roads</li> <li>● Adequate greenbelt will be developed and maintained</li> <li>● Regular check of proper technical conditions of vehicles and equipment shall be conducted to minimize emissions to atmosphere</li> <li>● Use of protective gears (masks) in dusty areas.</li> <li>● Set up continuous air quality monitoring system</li> <li>● Industries should have FTP/ESP to reduce the emission</li> </ul>	Individual industry and CuEVL's nominated personnel
Traffic congestion	<ul style="list-style-type: none"> <li>● Presence of CuEVL in that area will add traffic to the existing regional Meghna-Homna road as well as Dhaka-Chattogram highway.</li> <li>● Increase risk of road accidents</li> </ul>	<ul style="list-style-type: none"> <li>● Traffic management should be in place to ease the movement of vehicles going in and out of the complex.</li> <li>● Special traffic management signs shall be installed to regulate and maintain smooth traffic flow and avoid traffic jams as a result of increased traffic flow.</li> <li>● Establish proper pedestrian movement plan to prevent accidents.</li> </ul>	CuEVL's assigned Traffic warden

<b>Activity/Issues</b>	<b>Potential impacts</b>	<b>Proposed mitigation and enhancement measures</b>	<b>Responsible parties</b>
Employment opportunity	<ul style="list-style-type: none"> <li>● Employment of work/ labor force/ economy of the area</li> </ul>	<ul style="list-style-type: none"> <li>● Employ local people in the project activities as much as possible.</li> <li>● Promote supply from local suppliers</li> </ul>	Individual industry and CuEZL's nominated personnel
Drainage Congestion	<ul style="list-style-type: none"> <li>● Increase in paved areas will reduce percolation thus will increase the risk of drainage congestion and/or inundation of roads.</li> </ul>	<ul style="list-style-type: none"> <li>● Provide and maintain adequate drainage system and outfalls.</li> <li>● Maintain the finished road level above the 50-year flood level.</li> <li>● Increase open and green spaces as well as water retention ponds</li> </ul>	Monitored by CuEZL's nominated personnel

## **7.3 ENVIRONMENTAL MANAGEMENT PLAN**

### **7.3.1 Scope of EMP**

The primary objective of environmental management and monitoring is to record environmental impacts resulting from the project activities and to ensure implementation of the “mitigation measures” identified earlier (Tables 7.1, 7.2 and 7.3) in order to reduce adverse impacts and enhance positive impacts from specific project activities. Besides, it would also address any unexpected or unforeseen environmental impacts that may arise during construction and operation phases of the project.

The EMP should clearly outlines: (a) the measures to be taken during both construction and operation phases of the project to eliminate or offset adverse environmental impacts, or reduce them to acceptable levels; (b) the actions needed to implement these measures; and (c) a monitoring plan to assess the effectiveness of the mitigation measures employed. Environmental management and monitoring activities for CuEVL project are divided into management and monitoring: (a) during construction phase, and (b) during operation phase.

### **7.3.2 Work Plans and Schedules**

The environmental management program should be carried out as an integrated part of the project planning and execution. It must not be seen merely as an activity limited to monitoring and regulating activities against a pre-determined checklist of required actions. Rather it must interact dynamically as project implementation proceeds, dealing flexibly with environmental impacts, both expected and unexpected.

For this purpose, it is recommended that the Chief Operating Officer (COO) of CuEVL takes the overall responsibility of implementing environmental management and monitoring. The COO will form an Environmental Management Unit (EMU) with required manpower and expertise to ensure proper environmental monitoring, and to take appropriate measures (as outlined in Tables 7.1, 7.2 and 7.3) to mitigate any adverse impact and to enhance beneficial impacts, resulting from the project activities. The COO through its team will make sure that the Contractor undertake and implement appropriate measures as stipulated in the contract document, or as directed by the EMU to ensure proper environmental management of the project activities.

It should be emphasized that local communities should be involved in the management of activities that have potential impacts on them (e.g., drainage congestion, employment generation). They should be properly consulted before taking any management decision that may affect them. The viewpoint of the general people as well as some major stakeholders of the project has been presented in Annex B and Chapter 6. The input from the people can serve as a useful guideline in this regard.

The environmental management during the *construction phase* should be focused on addressing the possible negative impacts arising from:

- (a) Air pollution
- (b) Noise pollution
- (c) Drainage congestion
- (d) Traffic/communication problems
- (e) Water and soil pollution
- (f) Reduction of damage to plants and floral habitat
- (g) Accidents, spills and leaks

(h) Occupational health and safety

The environmental management during the *operation phase* should primarily be focused on addressing the possible negative impacts arising from:

- (a) Generation of solid waste and wastewater
- (b) Accidental spills of oils, hazardous chemicals, leaks, fugitive emissions of air hazardous pollutants, etc.
- (c) Increased volume of traffic, associated impacts on local traffic congestion
- (d) Air pollutants emissions from boilers, generators, and compressors
- (e) Work environment noise pollution from industrial processing
- (f) Monitoring of drinking water quality

The mitigation measures for addressing the above issues are listed in Tables 7.1, 7.2 and 7.3. It must be ensured that these measures are implemented in the field under the supervision of the EMU of the project.

## 7.4 ENVIRONMENTAL MONITORING PLAN

The primary objective of the environmental monitoring is to record environmental impacts resulting from the project activities and to ensure implementation of the “mitigation measures” identified earlier in order to reduce adverse impacts from project activities. In addition, monitoring plan should also include regular reviews of the impacts that cannot be adequately assessed before the start of the works, or which arise unexpectedly, along with appropriate measures to mitigate any negative impacts and/or enhancing beneficial impacts.

### 7.4.1 Monitoring during Construction Phase

The current status of progress in work at the CuEZL site according to the recent visit in October 2023 are given in Table 7.4 bellow.

Table 7.4: Current status of progress in work at the CuEZL site.

SN	Construction Items	Progress Status	Planned completion date	Comments
1	Land development	Completed	-	OHS/EHS must be integral to all construction
2	Boundary wall (Fencing on the riverside)	Completed	-	”
3	Internal Road Construction	12.5 out of 15 km (83%)		”
4	Sidewalks for Pedestrian	To be started in Feb 2024.		”
5	Surface drainage/storm water system	In progress (80% done)	April 2024	”
6	Water reservoir construction	In progress (55% done)	-	”
7	Street lighting	In progress	December, 2023	”
8	Construction of administration building, Medical Center, Training Academy, Custom	In progress	March, 2024	”

<b>SN</b>	<b>Construction Items</b>	<b>Progress Status</b>	<b>Planned completion date</b>	<b>Comments</b>
	House			
<b>9</b>	Construction of 6- storied staff dormitory	In progress	September, 2024	„
<b>10</b>	Construction of 3- storied central Mosque	In progress	-	„
<b>11</b>	Land use	155.28 Acres (43%)	-	„
<b>Industries</b>				
<b>1</b>	Meghna Glass Industries Ltd (MGIL).	Civil construction almost completed		Waste management must be integral to the design.
<b>2</b>	Meghna Steel Re-rolling Mills Ltd (MSRML).	Civil construction in progress		..

Tables 7.5 and 7.6 show monitoring plan for monitoring environmental parameters during construction phase and operation phase of the CuEZL project respectively.

**Table 7.5: Monitoring Plan during Construction Phase of the CuEZLProject**

Monitoring Issue/Item	Period/Location	Parameters to be monitored	Monitoring Frequency and responsibilities	Resources Required
Ambient Noise Level	<u>Baseline:</u> One set of measurements at property boundaries of selected locations (offices, residential areas.) prior to commencing construction activities	Equivalent Noise level (Leq) calculated over extended period monitoring	Prior to commencing construction or as directed by the EMU; Contractor's Responsibility	Noise level meter, GPS;
	Several set of measurements at the same locations during construction activities		Monthly or as directed by the EMU; Contractor's responsibility	
Working area Noise Level (personal exposure)	Workers working area (near construction equipment)	Equivalent Noise level (Leq) calculated over extended period monitoring	Monthly or as directed by the EMU; Contractor's Responsibility	Noise level meter
Air Quality (dust particles/particulate matter)	<u>Baseline:</u> One set of measurements at selected locations downwind of site activities (prior to commencement of work) and in close proximity to human receptors	SPM, PM <sub>10</sub> , and PM <sub>2.5</sub> with GPS location	Prior to commencing construction or as directed by the EMU; Contractor's Responsibility	Particulate matter sampling device, GPS
	Several set of measurements at selected locations downwind of site activities (during construction activities) and in close proximity to human receptors during construction activities		Monthly or as directed by the EMU; Contractor's responsibility	
Surface Water Quality	<u>Baseline:</u> One measurement from the nearest surface water body (Meghna River branch)	Turbidity, Total Suspended Solids, BOD <sub>5</sub> , Dissolved Oxygen	Prior to commencing construction or as directed by the EMU; Contractor's Responsibility	Laboratory facilities for water/wastewater analysis
	Several set of from the nearest surface water body (Meghna River branch) during construction activities		Monthly or as directed by the EMU; Contractor's responsibility	

<b>Monitoring Issue/Item</b>	<b>Period/Location</b>	<b>Parameters to be monitored</b>	<b>Monitoring Frequency and responsibilities</b>	<b>Resources Required</b>
General site and work environment condition	Visual survey of the construction site during the entire period of construction	General site condition, traffic condition, pedestrian movement, vegetation clearance etc. by visual survey (photographs)	Weekly or as directed by the EMU; Contractor's responsibility	Digital camera
Flooding due to inadequate drainage	Throughout the project area and entire period of construction	Site inspection	During rainy season	Digital camera
Improper stockpiling of spoils and construction materials	Throughout project area and entire period of construction	Site inspection	Quarterly	Digital camera
House-keeping activities	Visual survey of the construction site during the entire period of construction	Construction debris management, traffic management, management of flammable materials (if any), use of PPE by workers, all parameters related occupational health and safety etc.	Weekly or as directed by the EMU; Contractor's responsibility	Digital camera
Traffic management	Meghna - Homna road (entry to the CuEVL) and Dhaka - Chattogram Highway (at the intersection of Meghna – Homna road) and within the project area	Observations on and off site, any incident of accident	Monthly, during peak traffic time in Meghna - Homna road, Dhaka - Chattogram Highway and within the complex; Contractor's responsibility	Traffic warden assigned by CuEVL
Drinking water quality for workers	Supplied water (Tube well Water) and/or bottled water supplied to workers for drinking should be tested	pH, color, turbidity, total hardness, chloride, Total and Fecal coliform, Total Dissolved Solids, Arsenic,	Monthly or as directed by the EMU; Contractor's responsibility	Laboratory facilities for water/ wastewater

<b>Monitoring Issue/Item</b>	<b>Period/Location</b>	<b>Parameters to be monitored</b>	<b>Monitoring Frequency and responsibilities</b>	<b>Resources Required</b>
		Iron, Manganese, Electrical Conductivity (salinity), Free Chlorine		analysis

**Note 1:** Actual monitoring time and location will be decided by the EMU.

**Note 2:** The measured noise levels should conform to the national ambient noise level standards for different areas (residential, silent zone etc.) as applicable. Noise level during construction activities should be within the limits of exposure prescribed in the OSHA guidelines. The measured air quality should be within the limits of the national ambient air quality standards for Bangladesh

**Table 7.6: Monitoring plan during operation phase of the CuEZL project**

<b>Monitoring Issue/Item</b>	<b>Period/Location</b>	<b>Parameters to be monitored</b>	<b>Monitoring Frequency and responsibilities</b>	<b>Resources Required</b>
Air Quality (Particulate matter and gaseous air pollutants)	Multiple locations within the project area and industries generating air pollutant, or record continuous air quality data using an installed system at a designated location	CO, SO <sub>X</sub> , NO <sub>X</sub> , PM <sub>10</sub> , PM <sub>2.5</sub>	Monthly or as directed by the EMU; CuEZL responsibility	Portable particulate and gas analyzer or Install and use a continuous air quality monitoring system
Workplace Noise level	Within the industries, especially workplace near severe noise and vibration generating machineries, boiler, generator, compressor operator's room, etc.	Equivalent Noise level (Leq)	Monthly or as directed by the EMU; CuEZL and individual industry within the complex's responsibility	Noise level meter

<b>Monitoring Issue/Item</b>	<b>Period/Location</b>	<b>Parameters to be monitored</b>	<b>Monitoring Frequency and responsibilities</b>	<b>Resources Required</b>
Water Quality for drinking purpose	Should be measured each month	pH, color, turbidity, total hardness, chloride, Total and Fecal coliform, Total Dissolved Solids, Arsenic, Iron, Manganese, Electrical Conductivity (salinity), Free Chlorine	Monthly or as directed by the EMU; CuEZL's responsibility	Laboratory facilities for water/ wastewater analysis
Surface water (Meghna River branch) quality			Quarterly, CuEZL's responsibility	
Solid wastes	Solid waste generated from workers accommodation, industries, disposal site within the complex, SW produced in the production process of the factories in the Zone.	Visual inspection	Quarterly and as directed by the EMU; CuEZL's responsibility	Digital camera
Sanitary inspection and Septic tank desludging	Sanitary inspection and maintenance of all manholes, septic tank desludging	Routine maintenance	Once a year, CuEZL's responsibility to contract the relevant personnel	Hired vaccutag, manual emptying-
CETP influent and effluent quality	CETPs in CuEZL Complex	pH, TDS, EC, DO, BOD <sub>5</sub> , COD, Chloride.	Monthly, CuEZL's responsibility	Laboratory facilities for water/ wastewater analysis, Skilled personal
Performance of different units of CETP		Bacterial growth, MLSS, ETC.		
Ground Water Table	Monitoring well equipped with Pressure Transducer to be installed within the complex (as described in the commitment plan)	Depth of water table	Continuous monitoring at least a year, CuEZL'S responsibility	Skilled personal

Note 1: Actual monitoring time and location will be decided by the EMU.

Note 2: The measured noise levels should conform to the national ambient noise level standards for different areas (residential, silent zone etc.) as applicable. Noise level during construction activities should be within the limits of exposure prescribed in the OSHA guidelines. The measured air quality should be within the limits of the national ambient air quality standards for Bangladesh

#### **7.4.2 Institutional Arrangements for EMP Implementation**

The Cumilla Economic Zone is housed with a number of different type of industries. Although the overall responsibility lies within the CuEZL for ensuring proper implementation of mitigation measures and monitoring, every industry should have its own environmental management cell to take care of its own environmental policy, compliance and health and safety issues. The Contractor will be responsible for implementation of the EMP during construction work and Design and Supervision Consultant (DSC) will be primarily responsible for design, supervision, monitoring, and auditing of the implementation of the EMP. During operation phase, individual industry will implement and monitor the measures through its environment cell and the EMU of CuEZL will oversee the whole process.

CuEZL will establish an Environmental Management Unit (EMU) for this purpose. The EMU will be headed by an Environmental Manager, supported by technical staff in key fields as follows:

- Environmental Manager (1)
- Environmental Engineer/EMS Expert (1)
- Chemical/Mechanical Engineer (1)
- Laboratory Analyst/Technician

The responsibilities of the EMU will cover Environmental Policy, Compliance, Environmental Management System, Training, CETP Performance Monitoring, surface water and groundwater monitoring, Waste Management and 3R policy, policies related to sustainable green production etc. The COO of CuEZL will oversee the activities of EMU and EM will report to him.

For monitoring of ambient air, water, noise, CuEZL will set up its own laboratory for self-compliance and monitoring of inlet and outlet characteristics of industrial wastewater, receiving environment quality. CuEZL will also conduct continuous monitoring of ground water table by installing piezometer equipped with pressure transducer within the complex.

#### **7.4.3 Cost Estimation for Environmental Monitoring**

Most of the mitigation measures require the contractor of individual industry to adopt good practices, which should be part of their normal procedures already, so there are unlikely to be major costs associated with compliance. Mitigation that is the responsibility of CuEZL and contractor's will be provided as part of their management of the project. The tentative yearly cost involvement for Mitigation Measures and Monitoring during construction and operation phase are presented in Table 7.7 and Table 7.8. It is to be noted that these are nominal preliminary cost as sufficient information are not currently available for better estimates and the actual costs may be substantially different.

**Table 7.7: Tentative Cost estimation for Monitoring and Mitigation Measures during Construction phase**

Parameter/Activity	Frequency	Unit Cost in BDT	Total Cost in BDT (per year)
Air quality (CO, SO <sub>X</sub> , NO <sub>X</sub> , PM <sub>10</sub> , PM <sub>2.5</sub> )	One measurement before starting construction, then in each subsequent month	50,000/- (per set of measurement)	6,00,000/- (50,000x12)
Surface water quality (parameters: Turbidity, Total Suspended Solids, BOD <sub>5</sub> , Dissolved Oxygen)	One measurement before starting construction, then in each subsequent month	Tk. 10,000/- (per set of measurement)	1,20,000/- (10,000x12)
Noise Level (day and night-time ambient and personal exposure)	One measurement before starting construction, then in each subsequent month	50,000/- (Per set of measurement)	6,00,000/- (50,000x12)
Drinking water quality testing: pH, color, turbidity, total hardness, chloride, Total and Fecal coliform, Total Dissolved Solids, Arsenic, Iron, Manganese, Electrical Conductivity (salinity), Free Chlorine	Monthly	Tk. 15,000/- per set of measurement	1,80,000/- (15,000/-x12)
Site Cleaning and preparation including dismantling of structures, removal and safe disposal of debris, providing necessary protective fencing and safety measures with sign boards.	Periodic	Lump sum (for a whole year)	3,00,000/-
Providing safety gears like hand gloves, eye protection glasses, helmets, rubber shoes, light reflecting dress etc. for 40 sets @ Tk. 10,000 for each set	Periodic	Lump sum (for a whole year)	3,00,000/-
Temporary Sanitary Latrine/ Septic Tank/ Portable Toilet: 2 nos. (1 no of Toilet for female and 1 no of Toilet for male) @Tk. 50,000	Periodic	Lump sum (for a whole year)	1,00,000/-
Dust suppression measures like water sprinkling on aggregates/ unpaved roads, in and around the work site	Daily or weekly activities	Lump sum (for a whole year)	3,00,000/-

<b>Parameter/Activity</b>	<b>Frequency</b>	<b>Unit Cost in BDT</b>	<b>Total Cost in BDT (per year)</b>
Ecosystem restoration	---	Lump sum	1,00,000/-
Accidents/Emergency/Contingency		Lump sum	1,00,000/-
		<b>Total</b>	<b>27,00,000/-</b>

**Table 7.8: Tentative Cost estimation for Monitoring and Mitigation Measures during Operation Phase**

<b>Parameter/Activity</b>	<b>Frequency of Activity</b>	<b>Approximate Cost Estimate in BDT</b>
Ambient air quality (CO, SO <sub>x</sub> , NO <sub>x</sub> , PM <sub>10</sub> , PM <sub>2.5</sub> ) in individual industry	Monthly	Tk. 50,000/- (each set of measurements)
Drinking water quality testing: pH, color, turbidity, total hardness, chloride, Total and Fecal coliform, Total Dissolved Solids, Arsenic, Iron, Manganese, Electrical Conductivity (salinity), Free Chlorine	Monthly	Tk. 15,000/- (each set of measurements)
Surface water quality (parameters: Turbidity, Total Suspended Solids, BOD <sub>5</sub> , Dissolved Oxygen) for nearby river	Quarterly	10,000/- (each set of measurements)
Noise level monitoring at surrounding areas and within the industries (day and night-time ambient noise level and personal exposure)	Monthly	50,000/- (each set of measurements)
CETP Performance monitoring for influent, effluent samples	Monthly	Tk. 20,000/- (each set of measurements)
Solid waste management, recycling of wastes	Monthly	Tk. 10,000/- (Lump sum per month)
Vegetation and Tree plantation around the site including fencing/ conservation/ maintenance for at least 5 years	Periodic	50,000/- (Lump sum per year)
Water Table Monitoring	Periodic/ Quarterly	50,000/- (Lump sum per year)
Fisheries resources monitoring in the nearby river	Periodic/ Quarterly	50,000/- (Lump sum per year)
Fire drills	Periodic/ Quarterly	1,00,000/- (lump sum per year)
Accidents/ Emergency/Contingency	----	1,00,000/- (lump sum per year)

## **7.5 Enhancement Plan, Contingency Plan and Compensation Plan**

Along with the mitigation measures, CuEVL can adopt some measures which would enhance the positive impacts. As for example, CuEVL can adopt green production policy which will reduce the carbon footprint throughout its life cycle. It can practice 3R policy which will minimize the wastes. CuEVL can harvest rainwater and use it for domestic purposes. CuEVL can also make arrangements for groundwater recharge which will decrease its water footprint. CuEVL can promote industrial ecology and thus enhance sustainable development.

The implementation of the CuEVL project involves many complex and diverse risks. The identification and allocation of those risks is critical in structuring the financing facility for such a project. A contingency plan should be there to respond effectively in case of an unexpected situation. It can be used as an alternative action if expected results fail to materialize. Contingency planning is a component of disaster recovery and risk management. Contingency planning also serves as a tool for maintaining control over events or reduce the risk of loss of property. As for example, the project area is located close to Dhaka-Chattogram highway and surrounding human settlement. Here, human settlement and road traffic may be severely affected due to this project and conflicts with the local community, road accident or unforeseen situation may happen anytime and a contingency plan should be in place to tackle those situations.

From the Focus Group Meetings, it is evident that the lands where the CuEVL is situated were fallow land and as such no apparent loss of livelihood has taken place. Therefore, there is no eminent need for a “livelihood restoration plan”. Furthermore, CuEVL will bring more employment in the region. By hiring the local people after proper training, CuEVL can have positive impact on the livelihood and economy of the region.

## **7.6 Existing Environmental, Social, Health and Safety Related Management and Monitoring Plans of CuEVL**

For a smooth and effective implementation of environmental and social management and monitoring plan, the CuEVL project has developed several specific management and monitoring plans related to social, environmental, health and safety aspects. Details of these plans are described in Annexes. Table 7.9 summarizes them.

**Table 7.9: Existing Environmental, Social, Health and Safety Related Management and Monitoring Plans of CuEZL**

<b>Plan</b>	<b>Main objective</b>	<b>Annex reference for the detailed plan</b>
Grievance redress mechanism	To address conflicts, allegations, dissatisfaction, and grievances among the workers, management, and the local community	Annex J
Emergency response plan	To undertake immediate rescue and necessary measures as quickly as possible and to keep the loss of life, material, machinery/equipment damage, and impacts on the environment to a minimum.	Annex K
Occupational health and safety protocols and plans	To provide means of preventing workplace accidents, injuries, and work-related ill health	Annex N
Labor management plan	To ensure occupational rights and safety of factory workers	Annex O
Waste Management Plan	To effectively manage liquid waste, solid waste, debris and materials generated by within the CuEZL premises	Annex R

## **Chapter 8**

### **GAP ANALYSIS AND ACTION PLAN**

#### **8.1 Comparative Analysis of OP4.03 Standards with CuEZL Status**

Analysis of the gaps in the existing Environmental and Social Management System of CuEZL with respect to the eight World Bank Group Performance Standard Requirements pertaining to OP 4.03 and provide recommendations of closing the gap have been performed. The detailed analysis in tabular form is given in Annex Q.

#### **8.2 Environmental and Social Action Plan (ESAP)**

The Environmental and Social Action Plan (ESAP) is designed to address the gaps between the environmental social requirements as stated in PS 1-8 and that of the current practice of CuEZL. The ESAP describes feasible and practical corrective actions to be taken by CuEZL that will bring its operation in conformity with the OP4.03 Performance Standards, the responsible personnel within the CuEZL to carry out the actions as well as indicators and timeline of implementation of actions. The ESAP(Table 8.1) has been communicated with the top management of CuEZL and they have agreed to take the proposed actions within the stated timelines.

Table 8.1: Suggested Action Plan for Corresponding Gaps

S. No	Corrective Action	Details	Responsibility	Indicator	Timeline
PS 1: Assessment and Management of Environmental and Social Risks and Impacts					
1	CuEZL to establish its own ESMS commensurate with its nature and scale of impacts due to operation of its common/shared facilities and integrate the ESMS of industries within its premises, revise organizational	<p>The following should be included in CuEZL ESMS of operation of common/shared facilities:</p> <ul style="list-style-type: none"><li>• effect of groundwater extraction,</li><li>• drinking water compliance for water treatment,</li><li>• CETP/STP operation and compliance,</li></ul>	CuEZL to develop in association with its HR compliance Department	<ul style="list-style-type: none"><li>- Half-yearly E&amp;S compliance reports submitted to senior management of CuEZL, PFIs and Bangladesh Bank</li><li>- All industries have a defined focal point for E&amp;S compliance.</li></ul>	6 months

S. No	Corrective Action	Details	Responsibility	Indicator	Timeline
	<p>structure for ESMS implementation (if necessary), to keep senior management informed about ESMS compliance.</p> <ul style="list-style-type: none"> <li>• waste management,</li> <li>• chemical storage and hazard management,</li> <li>• documentation and reporting</li> </ul> <p>The integration of ESMS of industries under the CuEZL premises, CuEZL should develop</p> <ul style="list-style-type: none"> <li>• A protocol for E&amp;S screening for new industries,</li> <li>• A system of audit for assessing the effectiveness of environmental compliance and mitigation measures of existing industries,</li> <li>• a system of communication of compliance information with CuEZL</li> </ul> <p>CuEZL will revise their organizational structure (if necessary) for implementation with a designated focal point for E&amp;S Compliance and establish a system so that the senior management receive periodic reviews on all aspects of the ESMS.</p> <p>The organizational structure and interface with individual industries need to be</p>			<ul style="list-style-type: none"> <li>- Structure of reporting and flow of information is developed between the individual and central E&amp;S focal persons.</li> <li>- Developing and implementing an E&amp;S screening and audit mechanism for new and existing industries.</li> <li>- Modify the contract with individual industries to include clauses for complete sharing of ESMS compliance and monitoring reports periodically.</li> </ul>	

S. No	Corrective Action	Details	Responsibility	Indicator	Timeline
		<p>revised for effective implementation of ESMS. This includes:</p> <ul style="list-style-type: none"> <li>- ensuring that all industries under CuEZR has a designated focal person for ESMS</li> <li>- Establish a clear link between EHS focal person of CuEZR and that of individual industries and establish well-defined roles and hierarchy in monitoring and reporting.</li> </ul>			
2	Industries to develop Environmental and Social policies and to have environmental impact/screening documentations, emergency response and preparedness plans	<ul style="list-style-type: none"> <li>• CuEZR to ensure that all new industries have their own E&amp;S policies. Existing industries, which has not framed their E&amp;S policies yet, are to do so and submit to CuEZR</li> <li>• Existing industries, which has not framed their emergency response plans yet, are to do so and submit to CuEZR within the stipulated time frame</li> <li>• CuEZR needs to ensure that i) all industrial units (Yellow, Orange and Red category) have their IEE/EIA/EMP available at their premises (can be</li> </ul>	CuEZR E&S Focal Point	E&S policies and environmental impact/screening/ ESMS documents, emergency response plans of all industries are available in CuEZR records	3 months

S. No	Corrective Action	Details	Responsibility	Indicator	Timeline
		exempt if they have a fully developed ESMS). ii) Green industries perform E&S screening and develop an ESMS			
3	CuEZL to ensure that third party contractor activities are audited	<ul style="list-style-type: none"> <li>• CuEZL to develop an environmental and social audit system for construction contractors (sample audit form provided in the Annex)</li> <li>• CuEZL to ensure that final disposal of third party waste collectors are done in an environmentally sound manner</li> </ul>	CuEZL E&S Focal Point	<ul style="list-style-type: none"> <li>• Periodic audit reports of construction activities are available</li> <li>• Inclusion of final disposal clause in the contract agreement of the waste collector</li> <li>• General Environmental and Social Management Plan is incorporated in the Contract documents</li> </ul>	3 months
4	Conduct E&S compliance training on WBG Performance Standards	CuEZL should arrange for training of the EHS focal point (both their sister concerns and other industries) on relevant regulations, and the applicable requirements of PS 1 to 8	CuEZL HR Department	Training modules developed keeping including the WBG performance standards or hiring experts for such training	6 months
5	Environmental monitoring and impact monitoring of common/shared facilities by competent third parties	<ul style="list-style-type: none"> <li>• Competent third party should be engaged for environmental monitoring (ambient air, volatile organic compounds, effluent quality, drinking water quality parameters, etc,)</li> </ul>	CuEZL E&S Focal Point	<ul style="list-style-type: none"> <li>• Third party hired for monitoring water and effluent quality, air quality to comply with ECR, 2023standards</li> </ul>	3 months

S. No	Corrective Action	Details	Responsibility	Indicator	Timeline
		<ul style="list-style-type: none"> <li>• Install piezometers to monitor water level in tubewells</li> </ul>		<ul style="list-style-type: none"> <li>• Install piezometers and monitor water level along with seasonal fluctuations</li> </ul>	
6	Develop a stakeholder engagement Plan	<p>CuEZL should develop a stakeholder engagement plan which includes the following aspects:</p> <ul style="list-style-type: none"> <li>- consultations to be carried out with the local community during project operation.</li> <li>- Informed Consultation and Participation (ICP) in case of potential adverse impacts (e.g. lowering of GW table, effluent quality degrading surrounding environment)</li> </ul>	CuEZL Compliance Department	<ul style="list-style-type: none"> <li>• Stakeholder engagement plan developed</li> <li>• Documentation of consultations</li> </ul>	3 months
7	Endorsement of the updated GRM (Annex J)	The GRM has been updated to include the provisions in WBG OP 4.03 Performance Standards	CuEZL HR and compliance Department	Updated GRM endorsed by the management	1 month

#### PS 2: Labor and Working Conditions

8	Formalize the application of Labor Law 2013 through contract documents	CuEZL should explicitly include the relevant provisions of the Labor law 2013 (amended 2016) in their contract with	CuEZL HR and contract department	<ul style="list-style-type: none"> <li>• Contract with construction contractor explicitly states Labor law requirements</li> <li>• Contract with</li> </ul>	1 month
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S. No	Corrective Action	Details	Responsibility	Indicator	Timeline
		<p>construction contractors as well as the industries. The contract between CuEZL and the Contractor and industries should include the</p> <ul style="list-style-type: none"> <li>- requirements related to child labor, forced labor, wages, overtime, benefits</li> <li>- The requirement for providing safe and healthy working conditions in the industries.</li> </ul>		industries explicitly states Labor law requirements	
9	To ensure that occupational health and safety protocols and their audit mechanism is in place in industries	CuEZL should ensure that an occupational health and safety plan is in place for individual industries commensurate with the risks associated with each type of industry	CuEZL E&S focal person	<ul style="list-style-type: none"> <li>• Ensure that each industry under CuEZL has their own OHS plan documented</li> <li>• Third party contracted for periodic audit</li> </ul>	3 months
10	To establish a mechanism for audit for Construction contractors	system of audit to ensure that reasonable working conditions have been established at the construction worksite	CuEZL E&S focal person	Third party contracted for periodic audit	3 months
11	Endorsement of the	Modify or update the	New GRM	Register system	6 months

S. No	Corrective Action	Details	Responsibility	Indicator	Timeline
	updated GRM	<p>existing GRM for workers to make it more transparent and inclusive. This includes:</p> <ul style="list-style-type: none"> <li>- Informing the workers before start of work about the GRM and its redressal process</li> <li>- Maintaining a log-sheet of issues raised and resolved with time-stamps and necessary details</li> <li>- Extended to temporary workers</li> </ul>	endorsed by the CEO/MD	for grievances at the field level	

#### PS 3:Resource Efficiency and Pollution Prevention

12	Ensure the development of hazardous waste and raw materials management plan in the industries	CuEZL should ensure that the individual industries develop a hazardous waste and raw material management plan and audit their activities accordingly.	CuEZL E&S focal person	Hazardous waste and raw materials management plan developed in each industry.	3 months
13	Ensure that all industries have a system of audit of pollution prevention	All industries should have their own ESMS and establish a mechanism of monitoring environmental pollution.	CuEZL E&S focal person	<ul style="list-style-type: none"> <li>• Ensure that ESMS is developed for all industries.</li> <li>• Environmental audit records periodically submitted to CuEZL</li> </ul>	6 months
14	Stakeholder engagement plan to include feedback from communities to assess groundwater availability	Stakeholder discussion should be carried out with the people living around CuEZL to assess whether they are facing difficulties in extracting water from	CuEZL E&S focal person	Stakeholder engagement plan to include feedback from communities regarding GW availability	1 month

S. No	Corrective Action	Details	Responsibility	Indicator	Timeline
		their tubewells.			
15	Monitoring of water use by the industries as well as by the CUEZL and groundwater level fluctuation	Auditing of the water use and effluent disposal should be conducted along with monitoring the groundwater level through installation of piezometers equipped with data recorders.	CuEZL ESMP team to ensure installation of piezometers equipped data recorders for monitoring seasonal variation of groundwater table.	Routine reporting of water use and effluent disposal from industries; providing the time variable water level data in the CuEZL web page.	6 months
PS 4: Community Health, Safety, and Security					
15	Ensure community safety during construction works	Construction safety provisions need to be specified into the contract documents by CuEZL	CuEZL HR and Contract Department	Clauses for community safety included in the construction contracts	1 months
16	CETP Effluent quality monitoring by competent agencies	CuEZL does not have in-house capacity to carry out monitoring of all relevant parameters of CETP effluent quality. CuEZL should contract out CETP effluent quality monitoring activities to competent agencies.	CuEZL E&S Focal person	CETP effluent quality monitoring being done by competent agencies	1 month
17	Ensure that the Contractor keeps documentation of health/immunization records of temporary workers involved in construction	If the contractor observes any communicable disease in any worker, then he will report it to CuEZL and take necessary	Contractor to ensure treatment, CuEZL to supervise	Inclusion of a clause to incorporate keeping health records of temporary workers in the construction	1 month

S. No	Corrective Action	Details	Responsibility	Indicator	Timeline
		steps		contract	
18	Revise the emergency response and preparedness plan to include representatives from local communities	CuEZL will collaborate with local government agencies, and local people, in their preparations to respond effectively to emergency situations.	CuEZL E&S Focal person	Emergency Response plan updated to include involvement of local communities	1 months

#### PS 5: Land Acquisition and Involuntary Resettlement

PS5 not applicable because CuEZL has acquired land through ‘voluntary land transaction’, market transactions in which the seller is not obliged to sell and the buyer cannot resort to expropriation or other compulsory procedures when negotiations fail). To confirm that voluntary land transactions have taken place, a copy of a ‘Willing buyer-willing seller’ agreement have been included. A summary of discussion meeting held among the sellers where they confirm the validity of this transaction have also been provided.

#### PS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

1	CETP relevant parameter  Monitoring and external stakeholder engagement needs to be incorporated in the CuEZL. Professionals need to be engaged to assess the impact on bio-habitats and critical habitats (if any)	The waste water generated from the Facility will be treated before discharge into the branch of Meghna river.	CuEZL E&S Focal person	Effluent discharge parameters in ECR 2023 monitoring needed to identify any adverse impacts to ecosystem services and devise mitigation measures.	3 months
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#### PS 7: Indigenous Peoples

Baseline studies show that there are no indigenous people in the surrounding area of the CuEZL premises. Construction of new industries and their operation are limited within the CuEZL premises. Therefore, this is not relevant.

#### PS 8: Cultural Heritage

There are no cultural heritage sites within its premises. The cultural heritage sites (Sonargaon area) is located far from CuEZL premises. Therefore, this is not applicable/relevant. However, any

S. No	Corrective Action	Details	Responsibility	Indicator	Timeline
chance find will be dealt with using standard procedure.					

## **Chapter 9**

### **DISCUSSION AND CONCLUSIONS**

#### **9.1 Discussion and Conclusions**

Successful examples from around the world as well as Bangladesh's own positive experience with the EPZ model had encouraged the GoB to develop this new Economic Zone paradigm for Bangladesh to promote economic development. A public-private partnership model would be the mode of choice in the financing, developing, management and servicing of EZs. As a part of this initiative, Bangladesh Economic Zone Authority (BEZA) has granted a license for the development of the Cumilla Economic Zone Ltd. (CuEZL) within the vicinity of Dhaka city.

The CuEZL authority is also seeking for finances from private and other lenders including World Bank and Asian Development Bank. The World Bank financing requires the project to comply with certain regulations and standards for sustainable development. All the operations related to projects should be carried out in an environmentally responsible manner that comply with all local environment legal obligations and appropriate World Bank guidelines. In this regard, the developments in the CuEZL project should conform to the World Bank's Performance Standards for Private Sector Activities (OP 4.03). As part of the World Bank funding guidelines, an Environmental and Social Impact Assessment (ESIA) should be carried out to address the environmental and social issues of the project following operational procedures, policies, guidelines and standards set by the World Bank.

As a part of the ESIA of the proposed project, the baseline environment (including physical, biological and socio-economic environment) within and surrounding the project areas has been carefully surveyed and documented. The project activities during both construction and operational phases have been analyzed in order to assess their impacts on the baseline environment. The environmental impacts resulting from the proposed project activities have been assessed and evaluated for: (a) construction phase, and (b) operational phase. The potentially significant environmental impacts resulting from the project have been identified, and measures to mitigate the adverse impacts and enhance positive impacts have been proposed. In addition, occupational health and safety issues have been addressed extensively. Furthermore, mitigation measures to reduce the impact of this project within the project area and around the said location have been proposed. Finally, an environmental management plan (EMP) has been developed for guiding management of project activities during construction and operational phases. The above steps have been conducted following the World Bank Guidelines OP4.03 where eight Performance Standards were compared with the project activities as a part of the Gap Analysis. Documentations of the comparative analysis have been presented in the Annex Q and an Environmental and Social Action Plan has been provided in Chapter 8 which has to be strictly

followed by the project proponent to attain the requirements. This section summarizes the major findings from the assessment of impacts and recommendations for the ESIA study.

## **9.2 Conclusions**

The major conclusions of the ESIA report are summarized below:

### ***General Issues and Categorization***

As a part of the build-up process, the pre-construction phase involved land filling of the area (246.3615 Acres) has been elevated to the level of the regional road which is above flood level of 50-years' return period. This has already been completed and the land filling operation has altered the ecology and biodiversity of the area to a great extent, and the area has settled down to a new ambient condition.

At present, there are no industries in operation in the Cumilla EZ and only two plots have been allotted to the Meghna Steel and Re-Rolling Mills Ltd and Meghna Glass Industries Ltd who have started construction of these industries. A list of probable industries is provided in this document which are most likely to be SMEs and likely to be classified in the Orange or Red (as per ECR, 2023) category of DOE. As analyzed in this document, such industries will be in the medium risk or B category according to WB OP 4.03. A site audit shows that construction activities are reasonably well-managed. None of the expected industries are likely to be on the ESPP document's negative list and no such industries will be allowed in the Cumilla EZ premises. Based on statistical considerations, the average impacts of existing and future probable industries are likely to be moderate. Detailed analysis of impacts/risk in this document shows that risks are mostly either medium or low, on all environmental and social issues. Thus, the CuEZR subproject of IPFF-II has been classified as a medium risk (Category-B) sub-project.

### ***Construction Related Impacts (Boundary wall, Internal roads, Telecommunication, Car Park)***

The construction phase of this subprojects involves construction of infrastructures as there is no direct initiative by the tenants' industries are yet to set up their factories. Construction of the common facilities and service-related works are being done by the subproject proponent. Thus, the impacts during the current construction phase are limited to infrastructure only. These activities are likely to impact the physico-chemical environmental parameters such as drainage congestion, water pollution, noise pollution and air pollution, etc. The mitigation measures proposed/undertaken are considered to be sufficient to deal with the impacts. The Environmental and Social Action Plan will further strengthen the organizational capacity to deal with future impacts with better environmental governance.

### **Operation Stage Impacts**

It is anticipated that during the operational phase of the CuEZL, drainage congestion may pose a threat when the industries are progressively set up and road networks are constructed. Adequate green spaces and drainage outlets have been planned and will be constructed and maintained to combat the probable flooding, if any. These issues have been discussed further in the following.

### ***Drainage and Wastewater (CETP, ETP, STP)***

In the Master Plan of CuEZL around  $1979.73\text{ m}^2$  area is allocated for Central Effluent Treatment Plant (CETP) that will treat the wastewater from the industrial processes. It is also important for new industries to check whether pollution load in their effluent meet the requirements for influent of the CETP for subsequent treatment. If any industry exceeds the limit, it should install an individual ETP to reduce the pollution levels that can be acceptable at the CETP, which is now required by the MOEFCC notification (2019). It is to be noted that discharge of any polluted water, not conforming to standard, to the nearby canal is strictly prohibited. Strict compliance of CETP wastewater is to be achieved, and for this periodic monitoring and maintenance of CETP should be done by the CuEZL.

The drainage system has been designed with five outlets which is expected to be adequate to prevent flush flooding, but maintenance of the drainage system will be crucial in eliminating storm water congestion. During the operation stage, construction of most of the industries will be completed. Thus, the uncovered land in the subproject area will be reduced. Roads constructed in the subproject area will further reduce the uncovered land area. As a result, surface run off would increase. This might create drainage problem in the subproject area. CuEZL has designed green spaces on both sides of the roads, open space, parks, playground, water body, etc. which will be part of the non-processing areas. The overall non-processing areas constitute around 25% of CuEZL area. Green spaces of CuEZL is around 7.65% which is higher than BEZA mandatory requirement (5%). These spaces and water bodies will help percolation and retention of water respectively and will help reduce any drainage congestion. However, proper maintenance of the drainage system will be crucial in eliminating stormwater congestion.

### ***Water Resources***

The industries inside the CuEZL premises will use the groundwater only. There will be 5 deep tube wells within the CuEZL premises to meet domestic and a part of industrial water demands. During the full operation stage of the CuEZL subproject area, the extraction of groundwater may lower the ground water table in or near the subproject area. Being located on the bank of the Meghna River branch, groundwater recharge will be perennial. But it would still be important to monitor the groundwater level and recharge potential to assess and quantify the effect of ground water extraction. This will provide reliable information on the seasonal variation and groundwater recharge rate, which may be used to assess the sustainable availability of water for the neighboring locality. Successful operation of STP/CETP (when installed) shall eliminate any chances of releasing of improperly treated wastewater into the surrounding environment and natural water ways.

### ***Air and Noise***

During the operation stages of the CuEZL subproject, the number of vehicles in the area would increase. Emission from the increased number of vehicles would impact the air quality in the subproject area. The impact on air pollution is particularly critical in the dry season, since even at present condition PM<sub>10</sub> and PM<sub>2.5</sub> concentration levels exceed the National Ambient Air Quality Standards in Bangladesh set by the DoE.

Dust may be generated during the operation process in industries. There are also possibilities of fugitive emission of air pollutants including VOCs from paint, varnish, use of solvents. Since the industrial compounds are often closed buildings, therefore, the air pollutants get entrapped within the building and result in prolonged exposure for the workers and employees. The two quite large industrial units under construction (i.e., Glass and Steel) may have high air emissions unless properly managed. The steel industries in Bangladesh are notorious for local air pollution as most of these do no use Air Pollution Control (APC) systems. Special attention should be given to the use of hazardous materials like Arsenic in glass manufacturing (i.e., about 5 pound per ton of melt glass) to eliminate bubbles during the melting process and neutralize the green color caused by iron impurities in the glass. Arsenic may end up in the fugitive air emission without proper management. These large units will have their own ESAs as per law with provision of emission management.

The nature of air emission from other future industries in the CuEZL cannot be specified with any degree of certainty yet; but can be assumed to be similar to current ones in other EZs on statistical considerations. Future industries are mostly likely to be under ORANGE to RED Categories as per Bangladesh's Environment Conservation Rules, 2023. Some of the industries' have potential for air emissions and air emissions from combustion sources (boilers, generators) may also be important. If future investments lead to significant air emissions, these will be addressed through mitigation measures. However, as mentioned in the Gap Analysis (Annex Q), it is imperative that the CuEZL conducts indoor air quality monitoring campaigns in each of its industries to assess the baseline conditions. In addition, it has been proposed in this ESIA document that the CuEZL will set up a monitoring laboratory with the capability to continuously measure and record the air quality parameters and with capabilities of communicating with the CAMS system of the Department of Environment. The potential source of GHGs emissions from the facility will be relatively low as all power needs will be met from natural gas-driven captive generators/ national grid.

During the operation phase of the CuEZL subproject, the main source of noise would be the industrial processes due to operation of engine based power plants, machineries and vehicles transporting raw materials and finished goods. Vehicle carrying the staffs and visitors to the subproject area would also contribute to the noise level. Machineries used in the industries would also create significant noise. Mitigation measures and occupational health and safety measures proposed in the ESIA proposes appropriate use of PPE in noisy environments.

### ***Solid Waste***

Impacts of excavations, land development and construction waste generated so far have been dealt with successfully through on-site management and the issues faced caused only short-term problems. The CuEVL authority will establish a STS (Secondary Transfer Station) for temporary storage of solid wastes which will be subsequently disposed by DOE approved contractors or a full TSDF (Treatment, Storage, and Disposal Facilities) depending on requirements.

### ***Community Health and Safety and OHS***

The Community Health and Safety issues are covered by PS4 of WB OP 4.03. The project activities involve the health, safety, and security risks and impacts on project-affected communities and the corresponding responsibility to avoid or minimize such risks and impacts, with particular attention to people who, because of their particular circumstances, may be vulnerable, falls on the CuEVL management. The main objectives of the EHS management are listed below.

- To anticipate and avoid adverse impacts on the health and safety of project-affected communities during the project life cycle from both routine and non-routine circumstances.
- To anticipate and avoid adverse impacts on the health and safety of project-affected communities during the project life cycle from both routine and non-routine circumstances.
- To avoid or minimize community exposure to project-related traffic and road safety risks, diseases, and hazardous materials.
- To have in place effective measures to address emergency events.
- To ensure that the safeguarding of personnel and property is carried out in a manner that avoids or minimizes risks to the project-affected communities.
- EHS also aims to minimize workplace hazards and reduce accidents. Occupational health and safety (OHS) requirements for project workers are set out in more details in PS2.

### ***Traffic***

During the construction stage, transportation of construction materials would increase traffic flow in CuEVL subproject area. The subproject area is on the side inter-district road. The increased construction-related traffic demand, on top of the vehicular movement due to industrial activities, may create traffic congestion on the surrounding local roads. Continuous entry and exit of the traffic from the CuEVL subproject may slow down the local traffic. During the full operation of the industries, the main road connecting the CuEVL, and Dhaka-Chattogram highway traffic flow would increase in the subproject area at the start and end of office hours/industrial shifts. Proper traffic management measures are proposed in the ESIA to allay the dangers of accidents and ease congestion.

### ***Power Supply and GHG Emission***

Power supply in the CuEVL will come both from the national grid and captive generators. Ultimate capacity of captive generators may be as much as 100 MW which will not be supported by IPFF-II project and will be financed by CuEVL from its own resources. The

generators are likely to be based on 20-30 MW capacity internal combustion engines which have efficiency of around 35%. Without emission reduction measures as much as 400,000 tons of CO<sub>2</sub> may be emitted due to power generation using Simple Cycle NG Plant. However, tri generators, whose efficiency is in the range of 75% to 85%, may reduce more than 50% of CO<sub>2</sub> emission. To reduce GHG emissions co-production of industrial process steam and chilled water for space cooling (using absorption cooling method) are used. The total energy efficiency of such systems will be much higher leading to GHG emission savings can be up to 50%. Installation of Solar PV would lead to emission savings as well. Even a 1-MW capacity SPV may save up to 1500 tons of CO<sub>2</sub> emission per year. As per capita GHG emission in Bangladesh is only 1.54 Kg per year, compared to 6.9 Kg for world average, the investment for GHG emission reduction at CuEZL will be voluntary, but it may likely generate considerable savings in energy cost, if the emission savings measures, as discussed, are adopted.

### ***Fire management***

The CuEZL proposes to build its own fire stations and the whole area would be equipped with adequate number of fire hydrant network. Assessing the area coverage of the zone fire hydrant pillars needs have been assessed. There would be a pump to supply water to those hydrants through a separate water supply pipeline network. Each individual industry will have an underground fire water reserve tank and its own firefighting and fire detection system. BEZA Standard Operating Procedure for Services and Clearance relating to Fire Extinction (2020) will be applicable for the purpose. Effectiveness Certificate in favor of Fire safety arrangement and Fire License in Economic Zones and individual industries will have to be obtained from the Fire department.

### ***Health Centers***

Construction of a central hospital is envisaged in the CuEZL and as well access to medical facilities for the workers in the local medical facilities will be arranged.

### ***Community Amenities (Parks)***

CuEZL has been designed with green spaces on both sides of the roads, open spaces, parks, playground, water bodies, etc. which will be part of the non-processing areas. The overall non-processing areas constitute around 25% of CuEZL area. Keeping green spaces around 7.65% and open areas are also a mandatory requirement from BEZA. This will provide a recreational space for sharing the natural environment for the community.

### ***Labor Management and Occupational Safety***

About 800 workers are currently employed in the construction of Administrative Building, Meghna Steel and Re-Rolling Mills Ltd and Meghan Glass Industries Ltd in the CuEZL. Most of employees live in rented accommodation in nearby communities and others commute to work; some even from Dhaka as CuEZL is well connected by road. There are no female workers

working in the zone. CuEZL management will take measures to facilitate employment of female workers in the future, specially in the operation stage. There are no significant migrant workers as most workers are employed on long term basis. During the operational phase of the subproject, the number of workers may as high as 10,000. The ESIA has identified the labor management issues which are needed to be implemented to comply with both OP 4.03 and GOB requirements; and also, ILO conventions to which GOB is a signatory. Accordingly, the ESIA has outlined the labor management procedures and Occupational health & safety guidelines. ESIA provides for implementation of required EHS regulations e.g., WB EHGS and sectoral EHS guidelines for worker safety. CuEZL has an existing Emergency Response (ER) Plan, which outlines the protocols which CuEZL will adopt during an emergency situation. Additional actions have also been proposed in the ESIA that are aimed to reduce occupational hazards and health risks; and also, use of tools and procedures for proper implementation of ER measures including fire protection.

### ***Cumulative Impacts***

CuEZL would house industries of various types. It would take a long time before the full operation of all the industries begin. When new industries will start their operation, additional impacts may result from these operation processes. Even small impacts from the individual industry can add up and increase the cumulative effects. There are a number of industries in the vicinity of the CuEZL subproject area, which may add to the pollution and environmental impacts, and these are likely increase with time. For any environmental monitoring and management system, effects of all these industries inside and outside the CuEZL area need to be considered. Proper environmental management plan should have been prepared to avoid, mitigate, or reduce the impacts resulted from cumulative effects of all industries.

### ***Land Ownership***

Land parcels were purchased from local residents by MGI through ‘willing-buyer, willing-seller arrangement’, and the land was transferred to CuEZL for the development of the economic zone. Some pieces of land were also purchased from some companies. Eventually, a government gazette was published pinpointing the designated areas for the CuEZL development. Consultations with the host community and other stakeholders have been carried out as a part of this ESIA and potential issues were raised regarding land ownership. However, the buyers present in the meeting stated that they are satisfied with the issues. If legacy issues arise in the future, these will be addressed amicably through negotiations.

### ***Environmental and Social Management Plan***

An Environmental and Social Management Plan (ESMP), including monitoring requirements, has been developed to ensure implementation of the “mitigation and abatement measures” identified in the environmental assessment. An environmental laboratory with adequate staff and equipment has been proposed for monitoring and guiding the management measures. Proper mitigation measures, as suggested in the ESMP/ESAP, should be followed to reduce such adverse impacts to the extent possible. Restoration of ecological balance will be a pertinent responsibility of the subproject proponent. Accordingly, the ESMP has provided suggestions on tree plantation, wetland and surface water body preservation and green area

delineation which should be ensured by the proponent. The subproject would bring about socio-economic benefits during its operational phase through improvement of resilient building construction, risk reduction, disaster preparedness and trained personnel in the EZ.

### ***Public Participation and Community Concern***

During the operational phase, the subproject is likely to bring about significant benefit for the nation. Social issues are likely to play important role during the construction as well as operational phases. The subproject activities are likely to generate opportunity for significant employment. Coordination among the CuEZL personnel, its sister concerns and tenant industries need to be ensured through participatory approach. Relationship between the community and the subproject personnel regarding safety and security through a participatory program. Mitigation of noise and vibration problems should be addressed at the earliest to ease the concerns of the local people. Local roads (e.g., Meghna-Homna road) need to be improved for better accessibility. They also opined that road traffic may increase due to increase of vehicle involved in supply/delivery of the industries that may use the Dhaka-Chattogram highway and the local roads, which may increase the possibility of accidents and underlined the importance of proper traffic management measures. However, most participants at the consultation events expressed their supportive attitude towards the subproject. Community consultation will continue to be done throughout the life cycle of the subproject.

### ***Labor Management and Occupational Safety***

It is estimated that more than 10,000 workers may be employed in the factories in the CuEZL. Currently about 800 workers are employed in the CuEZL site. Most of employees will live in rented accommodation in nearby communities and others commute to work; some even from Dhaka as CuEZL is well connected by road. CuEZL management will take measures to facilitate employment of female workers along with male workers in future. It will also ensure that no child labor is employed at CuEZL. The ESIA has identified the labor management issues which are needed to be implemented to comply with both OP 4.03 and GOB requirements; and also, ILO conventions to which GOB is a signatory. Accordingly, the ESIA has outlined the labor management procedures and Occupational health & safety management guidelines. A standalone Occupational Health & Safety Management Guidelines is prepared for the CuEZL. The ESIA provides for implementation of required EHS regulations e.g., WB EHGS and sectoral EHS guidelines for worker safety. CuEZL has an existing Emergency Response (ER) Plan, which outlines the protocols which CuEZL will adopt during an emergency situation. Additional actions have also been proposed in the ESIA that are aimed to reduce occupational hazards and health risks; and also, use of tools and procedures for proper implementation of ER measures including fire protection.

### ***Grievance Redress Mechanism***

A Grievance Redress Mechanism (GRM) already exists for CuEZL with due procedures (see Annex J); through which aggrieved parties may launch complaint during both the construction and operational phase. CuEZL has the framework for addressing Sexual Exploitation and Abuse (SEA), and Sexual harassment (SH) related grievances (Annex S). In addition to this, as per Labour Rules, CuEZL will initiate participation meetings regularly with the workers, record

the minutes and submit those minutes to the Labour Office, Cumilla. Most of the grievances and issues are to be resolved in these meetings. External grievances are to be channelled through the elected representatives of the local union parishad.

### ***Compliance with PSs and Management Plan***

As CuEZL is no longer a green field subproject, an ‘Environmental Audit’ was conducted recently through which on site status was assessed and some compliance gaps were found. CuEZL management has promised to rectify those drawbacks. The existing gaps between the requirements of the OP4.03 Performance Standards and the current construction, operation and management practices of the CuEZL are provided in Annex Q. Based on the gap analysis, an Environmental and Social Action Plan (ESAP) has been proposed; which needs to be followed by the CuEZL to conform to the Performance Standards set in the OP 4.03. The ESAP describes feasible and practical corrective actions to be taken by CuEZL that will bring its operation in conformity with the OP4.03 Performance Standards, the responsible personnel within the CuEZL to carry out the actions as well as indicators and timeline of implementation of actions. The ESAP has been communicated with the top management of CuEZL and they are in agreement regarding taking the proposed actions within the stated timelines. The subproject will make its best effort to minimize the environmental and social impacts unavoidably associated with the subproject; during its entire life cycle by implementing suggested mitigation measures and management plans as described in this ESIA to ensure compliance with the requirement of the World Bank PS and EHS guidelines. CuEZL will ensure that the subproject conforms to all the legal, regulatory and policy objectives and also ensure that all the necessary permits are obtained and renewed from time to time as necessary.

### ***Disclosure***

The ESIA document has been disclosed on the CuEZL website and has also been posted on the websites of the Bangladesh Bank.

Finally, it is expected that all necessary information/ evidence contained in this report are enough to meet all requirements for the operation of the CuEZL’s facilities in accordance with WB OP4.03 and applicable WBG guidelines and standards.

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