

**ESIA STUDY OF THE PROJECT OF BANGLADESH
TECHNOSITY LIMITED (BTL) LOCATED IN THE
BANGABANDHU HI-TECH CITY**



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Bangladesh Technosity Limited

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An ISO Certified Consulting Firm

ESIA STUDY OF THE PROJECT OF BANGLADESH TECHNOSTY LIMITED (BTL) LOCATED IN THE BANGABANDHU HI-TECH CITY

Final Report

Volume-I

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ABBREVIATION

ASA	Association for Social Advancement
AAQ	Ambient Air Quality
BARC	Bangladesh Agriculture Research Council
BB	Bangladesh Bank
BHTC	Bangabandhu Hi-tech City
BHTPA	Bangladesh Hi Tech Park Authority
BMD	Bangladesh Meteorological Department
BRAC	Bangladesh Rural Advancement Centre
BTL	Bangladesh Technosity Limited
BWDB	Bangladesh Water Development Board
DBFOOT	Design, Build, Finance, Own, Operate & Transfer
DEM	Digital Elevation Model
DOE	Department of Environment
ECA	Ecologically Critical Area
ECC	Environmental Clearance Certificate
EHSGs	Environmental Health and Safety Guidelines
EIA	Environmental Impact Assessment
EM	Emergency Manager
EMU	Environmental Management Unit
ERC	Emergency Response Cell
ERP	Emergency Response Plan
ESMP	Environmental and Social Management Plan
ESMF	Environmental and Social Management Framework
EHS	Environmental, Health and Safety
EP	Environmental Parameters
EMP	Environmental Management Plan
FAP	Flood Action Plan
FGD	Focus Group Discussion

FO	Fire Officer
F/TFW	Food/Taka for Work
GCC	Gazipur City Corporation
GIIP	Good International Industry Practices
GIS	Geographical Information System
GoB	Government of Bangladesh
GRC	Grievance redress Cell
ICT	Information and Communication Technology
IMR	Infant Mortality Rate
IT	Information Technology
IDA	International Development Association
IEE	Initial Environmental Examination
IPFF	Investment Promotion and Financing Facility
MTB	Multi-Tenant Buildings
NGO	Non-Government Organization
PPP	Public Private Partnership
PS	Performance Standard
PWD	Public Works Department
RMP	Rural Maintenance Program
SCC	Site Clearance Certificate
SOB	Survey Of Bangladesh
U5MR	Under Five Mortality Rate
ULC	Union level committee
WB	World Bank

GLOSSARY

Adverse impact: An impact that is considered undesirable.

Ambient air: Surrounding air.

Aquatic: Growing or living in or near water.

Arsenic: Arsenic is a chemical element with symbol As and atomic number 33. Arsenic occurs in many minerals, usually in conjunction with sulfur and metals, and also as a pure elemental crystal. Arsenic is a metalloid.

Bangla: Bengali language.

Baseline (or Existing) Conditions: The 'baseline' essentially comprises the factual understanding and interpretation of existing environmental, social and health conditions of where the business activity is proposed. Understanding the baseline shall also include those trends present within it, and especially how changes could occur regardless of the presence of the project, i.e. the 'No-development Option'.

Bazar: Market.

Beel: A "back swamp" or depression. It can be either perennial or seasonal.

Beneficial impacts: Impacts, which are considered to be desirable and useful.

Biological diversity: The variety of life forms, the different plants, animals and micro Organisms, genes they contain and the ecosystems they form. It is usually considered at three levels: genetic diversity, species diversity and ecological diversity

Biological Oxygen Demand (BOD): The amount of dissolved oxygen, consumed in a biological process, which degrades the organic matter in water.

Consultation: the process of seeking the views of interested or affected stakeholders and engaging them in constructive two-way dialogue.

Ecology: Science, which studies relationships and interaction between organisms and their environment.

Ecological factor: Any part or condition of the environment that influences the life of one or more organisms.

Ecosystem: A dynamic complex of plant, animal, fungal and microorganism communities and associated non-living environment interacting as an ecological unit.

Emission: The total amount of solid, liquid or gaseous pollutant emitted into the atmosphere from a given source within a given time, as indicated, for e.g., in grams per cubic meter of gas or by a relative measure, upon discharge from the source.

Endangered species: Species in danger of extinction and whose survival is unlikely if the existing conditions continue to operate. Included among those are species whose numbers have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to suffer from immediate danger of extinction.

Environmental effects: The measurable changes, in the natural system of productivity and environmental quality, resulting from a development activity.

Environmental enhancement: An intentional change, which amplifies the anticipated positive impact of the project on an environmental component.

Environmental impact assessment (EIA)/Environmental assessment: The systematic, reproducible and interdisciplinary identification, prediction and evaluation, mitigation and management of impacts from a proposed development and its reasonable alternatives, sometimes known as environmental assessment.

Environmental Impact: An estimate or judgment of the significance and value of environmental effects for natural, socio-economic and human receptors.

Environmental Management Plan (EMP): A plan to undertake an array of follow-up activities which provide for the sound environmental management of a project/intervention so that adverse environmental impacts are minimized and mitigated; beneficial environmental effects are maximized; and sustainable development is ensured.

Environmental management: Managing the productive use of natural resources without reducing their productivity and quality.

Erosion: Process in which wind and water removes materials from their original place; for instance, soil washed away from an agricultural field.

Evaluation: The process of looking back at what has been really done or accomplished.

Fauna: A collective term denoting the animals occurring in a particular region or period.

Field Reconnaissance: A field activity that confirms the information gathered through secondary sources. This field study is essentially a rapid appraisal.

Flora: All of the plants found in a given area.

Flood Plain: Areas of relatively low-lying land seasonally inundated by over spill from adjacent rivers, lakes and natural depressions.

Habitat: The natural home or environment for a plant or animal.

Household: A household is defined as a dwelling unit where one or more persons live and eat together with common cooking arrangement. Persons living in the same dwelling unit by having separate cooking arrangements constitute separate households.

Important Environmental Component (IEC): These are environmental components of biophysical or socio-economic importance to one or more interested parties. The use of important environmental components helps to focus the environmental assessment.

Initial Environmental Assessment/ Evaluation: Preliminary analysis undertaken to ascertain whether there are sufficient likely significant adverse impacts to warrant a “full” EIA. In some countries, use of initial assessment forms a meaning of “screening” proposed projects.

Khal: Small Channel, Canal.

Land use: Types include agriculture, horticulture, settlement, pisciculture and industries.

Mauza: A *Bangla* word for the smallest government administrative area corresponding to a village revenue unit.

Magnitude: The degree of change in an important environmental component that results from a project activity. It refers to the size of the impacts and could be either beneficial or adverse.

Mitigation: An action, which may prevent or minimize adverse impacts and enhance beneficial impacts.

Natural Gas: Flammable gas, consisting largely of methane and other hydrocarbons, occurring naturally underground (often in association with petroleum) and used as fuel.

Negative Impact: Negative Change from the existing situation due to the project.

pH: pH is a measure of how acidic/basic water is. The range goes from 0 - 14, with 7 being neutral. pHs of less than 7 indicate acidity, whereas a pH of greater than 7 indicates a base. pH is really a measure of the relative amount of free hydrogen and hydroxyl ions in the water.

Public involvement/ Public consultation: A range of techniques that can be used to inform, consult or interact with stakeholders affected/to be affected by a proposal.

Reversible impact: An environmental impact that recovers either through natural process or with human assistance (e.g. cutting off fish migration by an embankment might be reversible at a later stage if a proper regulator is built).

Risk analysis: A technique used to determine the likelihood or chance of hazardous events occurring (such as the release of a certain quantity of a toxic gas) and the likely consequences.

Stakeholders: Those who may be potentially affected by a proposal e.g. Local people, the proponent, government agencies, NGOs, donors and others, all parties who may be affected by the project or take an interest in it.

Social impact assessment: The component of EIA concerned with changes in the structure and functioning of social orderings. In particular the changes that a development would create in: social relationship; community (population, structure, stability etc.); people's quality and way of life; language; ritual; political/economic processes; attitudes/values.

Socio-economic: The human environment, which includes social and economic components that are not termed biophysical.

Sustainability: Applied to positive impacts only and could be of three different types sustainable, sustainable with mitigation and non sustainable

Taka: Unit of Bangladeshi currency.

Terrestrial: Living on land.

Thana: Sub-district level of government administration, comprising several unions under a district.

Union: Smallest unit of local self government comprising several villages.

Upazila: Sub-district name. Upazila introduced in 1982.

Wildlife: Organism that can survive without any artificial help. The four general types are: mammals, amphibians, reptiles and birds.

Wildlife Habitat: An area maintained as an undisturbed breeding ground for wild fauna. The habitat is protected for the continued well-being of the resident and migratory fauna.

Zila: Bengali word of district.

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EXECUTIVE SUMMARY

E-1 INTRODUCTION

GoB has formed Bangladesh Hi Tech Park Authority (BHTPA) under Ministry of ICT to govern the development of the Parks. Bangabandhu Hi-tech City (BHTC) will be the first Special Economic Zone for IT/ITES and Hi-Tech Industry in Bangladesh. It is a Public Private Partnership (PPP) Project (DBFOOT-Design, Build, Finance, Own, Operate & Transfer). BTL will design, develop and operate the Block-3 of this Hi-Tech Park.

Categorization of the Project as per ECR-97 is based on the list provided in the document. According to ECR-97 this project falls in Red Category (i.e., Item 39 in the Red list). As BTL is only a sub-project in the BHTC, which has already received site clearance and an EIA approval from DOE. BTL will be required to have an EIA clearance from the DOE. Similarly, the BTL tenants in block-3 will require EIA approval for their facilities. According to analysis here, the BTL is classified as a 'medium Risk' (B) category project according to WB OP4.03.; based on the impact analysis in this report (Table 1.4.3). Only outstanding issue for BTL is management of e-waste by BTL tenants, which will be taken care of by the BHTC authority.

The objective of this ESIA is to understand the potential problems which are foreseen and addressed at the early stage in the project's planning and design. To achieve this assessment findings are communicated through an EIA report to all the groups who will make decisions about the proposed project, that is, the project developers, their investors, as well as regulating authorities, planners. Design, execution and operation of the project can be planned in light of the findings of ESIA, so that the expected benefits can be sustained with minimum and acceptable adverse environmental impacts. Thus essentially, this ESIA has:

- ❖ Reviewed the proposed site of the BTL in the Bangabandhu Hi-tech City and identify potential environmental impacts to be considered in the planning and design and implementation stage of the project.
- ❖ Identified the sources of impacts of the project activities, during construction and operational stages, on the various environmental components and recognizes those which are critical to the change resulting from the project its development or construction phase.
- ❖ Recommended an Environmental Management Plan (EMP) to avoid or mitigate adverse environmental impacts and enhance positive contributions of the project.
- ❖ Prepared implementable Environmental Management Plan (EMP) integrating the measures the identified impacts with suggested mitigation measures and an appropriate monitoring and supervision mechanism to ensure EMP implementation.
- ❖ Recommended suitable institutional mechanisms to monitor and supervise effective implementation of the EMP and provided an ESCP (Environmental and Social Commitment Plan) for overseeing the future activities of the tenants in Block-3 of BHTC allocated to BTL.

As the project is to be partly financed by the IPPF-II project of Bangladesh Bank, which is funded by WB; the ESIA aims at achieving an acceptable level of compliance with applicable World Bank

Group’s Performance Standards (PS 1-8); under WB OP4.03 applicable to IPFF-II project. This also implies compliance with the applicable WB EHS general and sector guidelines; and international best practice guidelines. The ESPP document¹ of the IPFF-II provides guidelines on the application of WBG PS in the sub-projects under the project. As WB and GOB requirements are rather similar except in a few cases (e.g., Categorization and emission standards), the OP4.03 compliance would provide assurance that the ESIA is compliant with the GOB requirement and also the Equator Banks’ requirements. Any specific difference between WBG PS and GOB laws/rules/guidelines will be explained as the issues arise.

E-2 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

There are eight WBG Performance Standards (PS), which are similar for both WB and IFC. These will be referred to as the World Bank Group Performance Standards for Projects. These PS are applicable to Private Sector (“WBG Performance Standards”) investment projects (or components thereof) that are designed, owned, constructed and/or operated by a Private Entity (as defined above), in lieu of the World Bank’s safeguard policies (“WB Safeguard Policies”).

The type of instrument used to identify and assess environmental and social risks may vary in accordance with the nature of the potential risks and impacts. This Hi-tech City project falls in the World Bank Category-B. Five performance standards will be triggered for this BTL project. The details of the PSs are discussed below:

Performance Standards	Applicable for the Project	
	Triggered	Not Triggered
<i><u>PS 1: Assessment and Management of Environmental and Social Risks and Impacts</u></i>	√	
<i><u>PS 2: Labor and Working Conditions</u></i>	√	
<i><u>PS3: Resource Efficiency and Pollution Prevention and Management</u></i>	√	
<i><u>PS4: Community Health, Safety, and Security</u></i>	√	
<i><u>PS5: Land Acquisition and Involuntary Resettlement</u></i>		√
<i><u>PS6: Biodiversity Conservation and Sustainable Management of Living</u></i>	√	
<i><u>PS7: Indigenous Peoples</u></i>		√
<i><u>PS8: Cultural Heritage</u></i>		√

E-3 DESCRIPTION OF THE PROJECT

The site of the BTL is in Gazipur district and connected to Dhaka-Tangail Highway and Railway. It is around 32 Km away from Dhaka Airport, 8Km away from Savar EPZ and 3Km away from proposed BangaBandhu-1 Satellite Transceiver Station. The entire project area is a government owned khas land and further developed by the Government with a view to establish a Hi-tech

¹ Environmental and Social Policy & Procedure for IPFF Project (Pl provide the link to BB website)

City. Since the government did not need to acquire any land for the project area, there was no resettlement issue with this project as the area was uninhabited.



Figure-E-1 Location of BHTC

Bangladesh is preparing to join a middle-income country by 2021. To materialize this vision, Bangladesh Government has taken various initiatives among which development of economic zones is one of them. Bangabandhu Hi-Tech City (BHTC) will be the first special economic zone for IT/ITES and Hi-Tech Industry in Bangladesh. The BHTC site is located in Gazipur district which is 32 km away from Dhaka. The site is well connected to the Dhaka-Tangail Highway and Railway and just 8 km away from Savar EPZ. Bangladesh Technosity Limited (BTL) has been awarded to design, develop and operate Block-3 of BHTC Project. Block-3 is a 40 acres of land where BTL will develop facilities for industries like IT/ ITES, BPO and Software Development, Hardware and Accessories Manufacturers, Data Center, Multimedia & Animation, Electronic Industry, Bio-Technology, Robotic Engineering, Telecommunications, R& D, Renewable energy, Automobile, Education & Training Institutes. The master plan of Block-3 prepared by BTL includes development of the allocated land and construction of a number of multi-tenant buildings (MTB), convention hall, data center, office spaces for IT/ITES, dormitories, food court, training facility, amphitheater, recreational facilities etc. The company will also construct and coordinate industrial facility, assembly line, commercial offices on behalf of the clients in the empty plots. BTL has planned to make Green Buildings providing solar panel at roof top as a renewable energy source, rainwater harvesting system to reduce the water usage, independent sewage treatment plant, LED light fixtures at all the common areas, proper shading device to reduce heat gain inside office space etc. Inclusion of all these features will make the project sustainable.

The Master plan for the Bangabandhu Hi-tech City has been prepared including various required buildings and installations in different zones, as per program design and requirement of the industry.

The project area of the BHTC is allotted into different Blocks. Each block is attributed to different types of business (Annex-VIII). BTL will develop their project in Block-III of the BHTC master plan. Figure-E-2 shows the BTL project layout plan.



Figure-E-2: BTL Project Area Layout Plan

BTL will build the following facilities in block-3:

- ❖ 01 Signature Multi-Tenant Building
- ❖ 5-10 Standard Multi-Tenant Building
- ❖ Industrial Plots (1 Bigha, 2 Bigha, 1 Acres)
- ❖ Data Center
- ❖ Convention Hall
- ❖ Dormitories
- ❖ Training Facility
- ❖ Food Courts
- ❖ Amphitheater
- ❖ Recreational Facilities

The target industries in the Hi-tech park project are listed below:

- i IT/ ITES

- ii BPO & Software Development
- iii Hardware & Accessories Manufacturers
- iv Data Center
- v Multimedia & Animation
- vi Electronics Industry
- vii Bio-Technology
- viii Robotic Engineering
- ix Telecommunication
- x Research & Development
- xi Renewable Energy
- xii Automobile
- xiii Education & Training institutes
- xiv Venture Capitalists
- xv Incubators.

E-4 ANALYSIS OF ALTERNATIVES

Since the site is preselected by the government there is no alternative option for this project. However, in case of no project scenario the nation would not get the integrated, ultra-modern techno-township that could attract investment from transnational and multinational companies/corporations. Without this project significant contributions to local, regional and national economic development through job creation and as a regional gateway for generating value added economic activities would not happen.

E-5 ENVIRONMENTAL AND SOCIAL BASELINE

The study area mostly lies in flat topography. Presently, the area is dominated by agricultural practices followed by settlements, forest, fishing during wet season. The study area does not have any ecologically critical area (ECA).

Ground water quality of April 2019 data comply with the National drinking water standards. Dry seasons surface water quality data of December last year was not available in the BWDB so the data for a full hydrological cycle (year) was not possible to analyze for this study. Similarly, the surface water quality data of full hydrological cycle was not possible to analyze due to unavailability of dry season data of BWDB. Comparison of the field-tested data of April 2019 with the surface water quality standards reveal the fact that water from the surface water bodies are fit for potable water supply after conventional treatment, usable for fisheries, Industrial process and cooling water requirement of industries and for irrigation.

As per tectonic classification, the area falls under Madhupur Tripura threshold of eastern platform flank of the Bengal basin. Tectonically this area is inactive and no apparent major structure like fault or fold exists in the region that might be geologically significant.

According to the Digital Elevation Model and Area Elevation curve, land elevation of the proposed Project site ranges between 3.7-12.5 m PWD. Analyses of the historical water level data

of Kaliakoir (Stn. ID 301) shows that the maximum water level reached at about 8.91m PWD in 1988 which was an extreme flood event in Bangladesh. The concerned study area is prone to occasional riverine flood but the project area has been developed considering 100 years flood level analysis.

There is a CAMS (Continuous Air Monitoring Station) belonging to DOE at Gazipur which is in the same air-shed considering weather parameters. In order to compensate for the local sources, the Gazipur CAMS data (2018) have been normalized using the site-based measurements. The data shows the general trend of high PM_{2.5} levels during dry period (November–April) in most areas of the country. There are no significant point sources of air emission within 10 km of the project site and hence the air pollutants in the area transported from other areas.

E-6 ANTICIPATED ENVIRONMENTAL AND SOCIAL IMPACTS

Environmental and Social Impact during Land Development:

The entire land of the BHTC is government owned khas land. The Government through the ministry of ICT has developed the land and segregated into five blocks. Later the BTL was awarded block-3 through competitive bidding for developing the infrastructures including buildings and other ancillary facilities. Due to the development of land, there was no Project Affected Persons (PAPs) in the project area. BTL has received a developed land from the Government so the environmental and social impacts due to land development were would be beyond the scope of this report.

Environmental and Social Impact during Construction Period:

Based on assessment of the baseline environment at different project locations (during field visits) and the nature and scale of the proposed project, it appears that there will be no irreversible adverse environmental and social impact due to project construction activities. Most of the adverse impacts are reversible in nature and could be mitigated or removed with appropriate environmental and social management. A number of positive social impacts in the form of increased service facilities, employment, transportation of people and goods are expected during the construction phase.

Environmental and Social Impact during Operation Period:

Based on assessment of the baseline environment at different project locations (during field visits) and the nature and scale of the proposed project, it appears that environmental and social impacts are not likely to be significant during the operation phase of the project. On the contrary a number of positive social impacts in the form of service facilities and employment, commercial activities, transportation of people and goods, etc. are expected. In addition, enhancement of fisheries resources would be possible through planned lake development, especially in Block-V. Plantation activities would make the Park area greener and would have a positive impact on the environment. Better physical and socio-economic environment is expected to improve the general health and nutrition of the people in and around the Park area.

E-7 INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

Discussions were held with the local communities closed to the BHTC. One focus group discussion was held in the Bakhtarpur village. The overall outputs from the FGD are-

1. No environmental concern is perceived by the population as the Hi-Tech Park is well protected by a height boundary wall.
2. This BHTC has constructed a central waste water treatment plant which is already in operation and this will mitigate the surface water pollution of the project area.
3. A substantial number of local people could get job in the construction and operation phases of the project.
4. Expect more job opportunity in the BHTC especially for jobless local young people.
5. Proper firefighting system should be installed in the BHTC for safety.

E-8 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) AND COMMITMENT PLAN (ESCP)

Bangladesh Technosity Limited (BTL) has been allotted Block-III for development, which is a sub-project of the Bangabandhu Hi-tech City Project (the Project), with the involvement of the Ministry of Science and Information Technology (MoSICT). The IPFF-II project of Bangladesh Bank funded by World Bank may provide financing for the Project, BTL subproject. With this financing prospect in view, BTL has decided to implement measures and actions, so that the sub-project is implemented in accordance with the World Bank Environmental Performance Standards (PSs) applicable to the IPFF-II project. The plots in block-3 are to be occupied by different companies which may set-up plant with signification pollution potential. BTL will ensure that the detrimental effect of pollution from these plants will be managed to keep the pollution level compliant with standards.

Where the ESCP refers to specific plans, whether they have already been prepared or are to be developed, the ESCP requires compliance with all mandatory provisions of such plans. In particular, the ESCP requires compliance with the mandatory measures and actions set out in ESIA that has been developed for the Project.

ESCP summarizes the material measures and actions that are required, the basis of the requirement, the timing of the measure or action, and the criteria to be used for determining whether the required measure or action has been successfully achieved. BTL is responsible for compliance with all requirements of the ESCP even when implementation of specific measures and actions is conducted by the Ministry, agency or unit referenced in above.

Implementation of the material measures and actions set out in this ESCP will be monitored and reported to the IPFF-II PIU by BTL as required by the ESCP and the conditions of the legal agreement, and will be shared with the World Bank as required in the IPFF-II project requirements.

As agreed by the Bangladesh Bank and BTL, this ESCP may be revised from time to time during Project implementation, to reflect adaptive management of Project changes and unforeseen circumstances or in response to assessment of Project performance conducted under the ESCP itself. In such circumstances, BTL will promptly propose and agree changes with Bangladesh

Bank and will update the ESCP to reflect such changes. Agreement on changes to the ESCP will be documented through the exchange of letters signed between BB and the BTL. The BTL will promptly disclose the updated ESCP.

Where risks and impacts arise during Project implementation, the BTL shall provide additional funds to implement actions and measures to address such risks and impacts, which may include risks and impacts that are relevant to the Project, such as, environmental, health, and safety impacts, labor influx, gender-based violence etc.

E-9 CONCLUSION

The Environmental and Social Impact Assessment (ESIA) of the proposed BTL Technosity Limited has been carried in compliance with the WBG OP4.03 and WBG guidelines. As explained in the document. The document is also compliant to GOB Laws, Rules, guidelines and international conventions signed by the GOB. It is also compliant with Equator Banks' requirements.

The study has demonstrated that proactive environmental actions mentioned in the report shall be incorporated in the project design, installation, construction and operational process in all installations in the BTL project area

Consultations with the project affected community and other stakeholders have been carried out and shall continue throughout the project lifecycle. Consultation and engagement meeting ensured that all the stakeholders' concerns about the proposed project were addressed to the satisfaction of the stakeholders.

Environmental baseline conditions (biophysical and socio-economic) as well as sensitive components of the study area were established through field data gathering/ sampling and complemented with information from the analysis of published literature, maps and information from articles on the project area. The established baseline data will serve as future reference and for monitoring purposes.

Climatic information was obtained from data published by GOB's department of meteorology. Results from laboratory analyses of surface water, groundwater, soil and sediments as well as air/ noise measurements were obtained from the area studied. The methodologies for quality assurance of the have been explained.

Air quality data shows that during dry season (December to May) AQ data especially PM2.5 levels exceeded NAAQS for a substantial number of days although there are no substantial air emission sources in the impact zone of the project (i.e., 10 km). Analysis in the report shows that the project will not add significantly to the local air emissions. Noise levels were found to be below regulatory limits. Surface water, groundwater, soil and sediment results showed that analyzed parameters were consistent across sample stations and compared well with control points values. It is observed that for groundwater is of high enough quality to meet the drinking water standard. The wastewater produced will be sent to CETP for treatment, which is already

in operation. However, building-wise Mitigation measures for wastewater treatment using MBS/SBR technologies may also be built to meet the green building criteria.

Solid waste especially e-waste is a problematic issue and facility is currently available in the for its disposal in the country. BTL is tenant in BHTC Park, which is a GOB facility and it is being supported by another WB project PSDSP. The park authority has committed to build an e-waste facility and provide its service to BTL. Until its services is available, the small volume e-waste produced will be kept in the storage for future disposal. As BHTC Park is a GOB facility, BTL qualifies for exemption for construction of a e-waste facility under clause 7 of WB OP4.03.

An Environmental and Social Action/Management Plan (ESA/MP) has been developed during this study to ensure that procedures for managing adverse impacts of the BTL facility operations as well as the implementation of the environmental and social commitments made are maintained throughout the duration of the project. The ESMP also contains the environmental monitoring program that would be used to monitor future changes to the environment from project activities. As a result, BTL would ensure that air pollutants, noise, surface water and groundwater are monitored in line with WBG standards.

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

CHAPTER-1: INTRODUCTION

1.1 BACKGROUND OF THE PROJECT

GoB has formed Bangladesh Hi Tech Park Authority (BHTPA) under Ministry of ICT to govern the development of the Parks. Bangabandhu Hi-tech City will be the first Special Economic Zone for IT/ITES and Hi-Tech Industry in Bangladesh. It is a Public Private Partnership (PPP) Project (DBFOOT-Design, Build, Finance, Own, Operate & Transfer). BTL will design, develop and operate the Block-3 of this Hi-Tech Park.

1.2 OBJECTIVE OF THE STUDY

An Environmental & Social Impact Assessment (ESIA) is a very effective tool, which delineates what needs to be done to make a development activity suitably located and operated in an environment friendly way. It is a formal process to be used to examine the environmental consequences of a proposed project and suggest relevant management actions. Impact assessment is not meant for examining adverse consequence only; it should also look into the plausible positive effects by the project activities and identify ways of enhancing them further by carrying out modifications in the project. ESIA process involves study of the plausible changes of the physical, biological and socio-economic environment as the consequence of the proposed project activities, and formulating a suitable Environmental Management Plan (EMP) to minimize or abate adverse effects and to enhance or augment positive effects.

As the project is to be partly financed by the IPPF-II project of Bangladesh Bank, which is funded by WB, the ESIA aims at achieving an acceptable level of compliance with applicable World Bank Group's Performance Standards (PS 1-8); under WB OP4.03 applicable to the IPPF-II project. This also implies compliance with the applicable WB EHS general and sector guidelines; and international best practice guidelines. As WB and GOB requirements are rather similar except in a few cases (e.g., emission standards), the OP4.03 compliance would provide assurance that the ESIA is compliant with GOB requirement and also the Equator Banks' requirements.

1.3 SCOPE OF WORKS

The detailed scope of the ESIA study is as outlined below:

- Screening of the Project based on applicable reference framework based on reconnaissance survey and field based 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;
- Monitoring, 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 Stakeholder Consultation and Grievance Redress Mechanism for the Project.

1.4 APPROACH AND METHODOLOGY

At the first step, project screening and scoping exercise was undertaken to identify the issues needed to be considered for the study as per WBG Performance Standards (PS) and to outline the activities for collecting information on each of the relevant issues. The table-1.4-1 below lists 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-1.4-1: List of Studies and Work Streams Required for Compliance with WBG PS

Sl. No.	Study Items/Topics	Applicable WBG PS and other guidelines	Reference Chapter/Annex
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 predicting 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 prioritize for studies needed and risk analysis. Year-wise phase implementation schedule should be provided. Applicable Standards/Guidelines: PS1, WBG EHSG	Chapter-2, 3,4&5
2	Audit of work in progress in the project area.	As this is no longer a green field project and an audit for all environmental and social activities has to be done. Applicable Standards/Guidelines: PS1-PS8	Annex-VII
3	Legal and Policy Framework	Applicable Standards/Guidelines: PS1	Chapter-2
4	Baseline Studies	Applicable Standards/Guidelines: PS1, PS3	Chapter-4
5	Water Resources and water pollution potential Study	Applicable Standards/Guidelines: PS3, WBG EHSG	Chapter-4
6	Air Emissions study	Applicable Standards/Guidelines: PS3, WBG EHSG	Chapter-4
7	Climate Change Risk Assessment and GHG emission Assessment	Applicable Standards/Guidelines: PS3, IPCC Assessment Reports (2014 and 2018)	Chapter-4
8	Noise Emissions Assessment	Applicable Standards/Guidelines: PS3, WBG EHSG	Chapter-4
9	Seismicity Assessment	Applicable Standards/Guidelines: PS3, WBG EHSG	Chapter-4
10	Soil Characteristics Assessment	Applicable Standards/Guidelines: PS3, WBG EHSG	Chapter-4
11	Flood Potential Assessment	Applicable Standards/Guidelines: PS3, WBG EHSG	Chapter-4

Sl. No.	Study Items/Topics	Applicable WBG PS and other guidelines	Reference Chapter/Annex
12	Cumulative Impact Assessment	Applicable Standards/Guidelines: PS3	Annex-II
13	Labor, human rights and gender Assessment	Applicable Standards/Guidelines: PS2	Annex-IV
14	Community Health, Safety (including Hazardous materials) and Security Review	Applicable Standards/Guidelines: PS3, PS4, WBG EHSG	Annex-IV
15	Indigenous People status Review	Applicable Standards/Guidelines: PS7	Annex-I
16	Critical Habitat Review and Ecosystem Services Assessment	Applicable Standards/Guidelines: PS6, IUCN Guidelines	Annex-I
17	Cultural Heritage (both tangible and intangible) Assessment	Applicable Standards/Guidelines: PS8	Annex-I
18	Stakeholder engagement plan (SEP) including Grievance Redress	Applicable Standards/Guidelines: PS1, PS5	Annex-III & VI
19	Consideration of alternatives		Chapter-6
20	Resettlement Action Plan (RAP)	Applicable Standards/Guidelines: PS5	Not Applicable
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	Annex-IV
22	Disclosure	Applicable Standards/Guidelines: PS1	Annex-III

The detailed documentation on the studies are provided in the Annexes with summary in the main report. Quantitative assessment as far as practicable have been done. The summarized findings of the studies are included in the main ESIA document.

Data pertaining to all facets of the environment and social viz. physical, ecological and socioeconomic environment were collected from the study area through both primary and secondary sources.

The stepwise activities are detailed in the following subsections:

1.4.1 Preliminary Discussions with Project Proponent

- Discussions held with BTL, to understand the proposed project, current status of agreements (i.e. implementation, land, water, gas supply, power purchase etc.), Project milestones, legal requirements and scope; and
- Collation of relevant project documents such as the project feasibility report, land records, copy of agreements etc.

1.4.2 Screening and Scoping Exercise

- Desk based 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 preliminary discussions with locals, stakeholders;
- The outcome of the screening was then used to identify the study area, key data to be collected and the categorization of the project; and
- A preliminary stakeholder mapping exercise was also undertaken to identify key stakeholders from the Government, relevant Governmental Agencies, Non-Governmental Organizations (NGOs) as well as the community at the local, regional and national level. This information was then used for consultation during different stages of the project.

Categorization

There is difference in project categorization as per WBG PS and GOB rules (ECR-97). A comparative analysis between technical requirements of the thematic World Bank Performance Standards 2-8 is given in Annex-XIX and more details can be found in the IPFF-II ESPP document. Table-1.4-2 shows different categories subprojects descriptions in brief.

Table-1.4-2 E&S Risk Rating of Sub-projects under IPFF-II.

Category	Description
High risk	<p>Sub-projects that are likely to have significant adverse E&S impacts that are diverse², irreversible³, or unprecedented⁴.</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>PFIs will always rate sub-projects that may involve activities on the List of E&S Sensitive Activities as High risk. In should be noted that there may be other high risk situations beyond those included in this List. Therefore, E&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>

²Diverse 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).

³Irreversible 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).

⁴Unprecedented 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.

Category	Description
Medium risk	Sub-projects that are likely to have adverse E&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.
Low risk	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&S impacts. While PFIs would have Low risk rating within their overall ESMS, IPFF II sub-projects may not be rated Low risk.

Categorization of the Project as per ECR-97 is based on the list provided in the document. WB's categorization is risk based as shown in the table 1.4-3. According to ECR-97 this project falls in Red Category (i.e., Item 39 in the Red list). As BTL is only a sub-project in the BHTC which has already received EIA approval including site clearance from DOE, BTL will be required to have EIA clearance from DOE. According to analysis here the BTL is classified a 'medium Risk' (B) category. Only outstanding issue for BTL is management of e-waste which will be taken care of by the BHTC authority. The risks are considered in more detail in Chapter-5.

Scoping

The categorization with respect to WB and IFC classifications was further used as a basis for defining scope for the impact assessment, planning and implementation of mitigation, monitoring and reporting mechanisms for the project to meet potential lender's requirements as well as those of the GOB.

1. 4.3 Baseline Data Collection

- 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 June to July 2016 and April 2019;
- Socio-economic data collection and consultation was carried out in July 2016 and April 2019;
- 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 **Chapter 5** of 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;
- 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 (Chapter 7); and
- Information gathered was used for formulating mitigation measures and environmental and social management plan/s.

1.4.4 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), 1997 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 both the General Guidelines and the specific one for the ‘Semiconductor and electronic manufacturing’;
- 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 mitigation has 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.

1.4.5 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.

1.4.6 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 was developed to address any complaints and concerns from all stakeholders;
- Based on the risk assessment, risk reduction measures and recommendations for a disaster management plan (DMP) were also developed; and
- Institutional review and finalization of the EMP and grievance.

1.4.7 Information/Data Sources

Key relevant information sources have been summarized in Table 1.4-4.

Table 1.4-4 Key Data Sources

Parameters	Information sources	Remarks
Project Background, Technical details on project and associated components	<ul style="list-style-type: none"> • Project specification documents from Bangladesh Technosity Ltd. • Project Execution milestones, Plot Plan layout, Organizational Structure 	Bangladesh Technosity Ltd provided other information required during the course of the study

Parameters	Information sources	Remarks
Study area features and sensitivities	<ul style="list-style-type: none"> • Ground physical Survey • Satellite imageries • National web portal of Bangladesh: www.bangladesh.gov.bd 	Details of the satellite data used is included in Baseline Chapter
Legal framework	<ul style="list-style-type: none"> • Department of Environment • Board of Investment, Bangladesh • IFC and WB documents 	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"> • Ground Physical Survey • GIS based land-use analysis • Bangladesh Meteorological department • Observatory Surface Meteorological Data 	Details of the satellite data used is included in Baseline chapter
Geology, Topography, Hydrology and drainage	<ul style="list-style-type: none"> • BTL study reports, Location Map • Bangladesh water development board • Web portal of National Encyclopedia of Bangladesh (Banglapedia) 	In association with field Observations
Natural hazards	<ul style="list-style-type: none"> • Web portal of National Encyclopedia of Bangladesh (Banglapedia) • Bangladesh Meteorological Department 	Included in consultation with Locals
Environmental baseline as Air quality, water quality, soil and sediment quality	<ul style="list-style-type: none"> • Primary data collection • Applicable Standards from DOE, Bangladesh 	Monitoring was completed from June to July 2016
Ecological parameters	<ul style="list-style-type: none"> • Secondary data collection, observations, surveys and local consultations • Websites of birdlife international • IUCN Data base 	Data collection was carried out in the month of June to July 2016, Endangered, critical status was checked from the website: www.iucnredlist.org
Social-economic parameters	<ul style="list-style-type: none"> • Primary data collection surveys, extensive consultations, meetings and discussions held with stakeholders • Bangladesh population Census for 20011 for Gazipur District • Fisheries Census data • Implementation manual of Rural Social, Program, Gazipur, • Land Regulation Policy, Bangladesh • Land Acquisition and Compensation data for the project site • OPD data from local Healthcare Department • Website of Department of Social Services • Web portal of National Encyclopedia of Bangladesh (Banglapedia) 	Primary Socio-economic Survey was carried out in month of June-July 2016. Details provided in baseline environmental and social conditions chapter.

1.5 TRIGGERING OF WBG PS IN BTL

The triggering of the WBG Performance Standards (PS) in the present project with explanations are given in the Table-1.5-1 below. The applicable GOB laws, Rules, Policies, Guidelines are listed alongside the WBG PS. The International Conventions signed by Bangladesh are also included, as once signed these are equivalent to the laws.

Table-1.5-1: Triggered WBG Performance Standard (PS) in the Project

Sl.	PS and Tittle	Triggered	Applicable Bangladesh Laws/Rules and conventions to which Bangladesh is a Party
		Yes/No	
1	Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts	Yes	Bangladesh Environmental Conservation Act (ECA95), 1995 and amendments; Environment Conservation Rules (ECR), 1997 and amendments; National Environmental Policy, 1992; Environmental Court Act, 2010; National Environmental Management Action Plan, 1995, National Water Policy, 2000; National Water Management Plan, 2001,
<p>Explanations: PS1 is triggered in this project. This is an umbrella Standard as Assessment and Management of Environmental and Social Risks and Impacts are important in all projects with land-based activities (i.e., during construction, operation and decommissioning phases). The issues that may pose potential E&S risks and/or impacts include air emissions, water pollution, wastes and effluents and engagement of labor etc. These issues have to be assessed to determine the extent of the risks and impacts. Annex-I, Annex-II, Annex-IV & Annex-XX have described in details of the PS-1.</p>			
2	Performance Standard 2: Labor and Working Conditions	Yes	Bangladesh Factories Act (1965); Bangladesh Labor Act, 2006; Bangladesh labor Rules (2015), Bangladesh Children’s Act 2013; ILO Conventions 29, 87, 98, 100, 105, 111 and 182;.
<p>Explanations: PS2 is triggered in this project; as during all phases of the project labor force will be needed and mobilized. to carry out various duties to construct and operate the project. It is therefore necessary for the Project to maintain appropriate labor and working conditions. Annex-IV described in details of the PS-2. Labor Management procedure is explained in Anne-XX.</p>			
3	Performance Standard 3: Resource Efficiency and Pollution Prevention	Yes	ECA95 and amendments, ECR 97 and amendments; Noise Pollution (Control) Rules 2006, Agricultural Pesticide Ordinance, 1971; The Fertilizer Regulation Order, 1995; International Convention for the Prevention of Pollution of the Sea by Oil, London, 1954 (Ratified 1981); The Ground Water Management Ordinance, 1985; Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal, Basel, 1989 (Ratified 1993); Montreal Protocol on Substances that Deplete the Ozone Layer, Montreal, 1987 (Ratified 1990), (London Amendment, 1990) (Ratified 1994).
<p>Explanations: PS2 is triggered in this project; as it will involve use of a lot of resources both raw, semi-manufactured, manufactured components and energy. Thus, pollutants will be produced and these need to be minimized to comply with standards; resources and energy conservation are also prime needs. Construction works are likely to generate wastes during the construction phase. In addition operational effluent discharges including associated emissions may have pollution potentials. In addition, the DSP will depend on resources / raw material inputs such as natural and manufactured resources. PS3 is triggered. Chapter-3 & Annex-I have described the PS-3 of this project.</p>			

4	Performance Standard 4: Community Health, Safety, and Security	Yes	<i>The Fertilizer Regulation Order, 1995; Disaster Management Act 2012; Motor Vehicle Ordinance 1983; Bangladesh Private Security Regulations Act, 2006.</i>
<p>Explanations: PS4 is triggered in the project. Although, the project site was initially empty and there are small local communities in the 3km impact zone around the park. With increased activities in the park, there will be influx of workers and service providers which will give rise new locals communities; who will be impacted by the activities in the park. Although the project is likely to be beneficial to entrepreneur and stakeholders, some beneficial impacts are also expected to the community e.g. employment as well as negative impacts e.g. fire and explosion risks. Annex-I, II, III, IV, VI described the PS-4 of the project.</p>			
5	Performance Standard 5: Land Acquisition and Involuntary Resettlement	No	Acquisition and Requisition Ordinance, 1982.
<p>Explanations: PS5 will not be triggered in the project. The land in the park belong to GOB and there are no squatters on the land. The notification of Award of the project area is Annexed in Annex-XVIII.</p>			
6	Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	Yes	<i>Bangladesh Wild Life (Preservation) Act, 1974; National Biodiversity Strategy and Action Plan (2004): Fish Act and Rules, Bangladesh Water Act 2013; National Water Bodies Protection Act 2000, National Conservation Strategy, 1992, ECA95, National Water Policy, 2000; National Water Management Plan, 2001; International Plant Protection Convention, Rome, 1951 (Ratified 1978); Convention on Wetlands of International Importance, especially as Waterfowl Habitat, Ramsar, 1971; the Ramsar Convention (Ratified 1992); Convention on International Trade in Endangered Species of Wild Fauna and Flora, Washington, 1973 (CITES Convention) (Ratified 1982); Agreement on the network of Aquaculture Centers in Asia and Pacific (NACA), 1988; Convention on Biological Diversity, Rio de Janeiro, 1992 (Ratified 1994); International Convention to Combat Desertification, 1994.</i>
<p>Explanations : PS6 is triggered in the project as the issues involved are universal. The parkland was fallow, before it was taken up for development. There are no significant biological or ecological issues in the area. Annex-I described the environmental baseline of the project.</p>			
7	Performance Standard 7: Indigenous Peoples	No	Chittagong Hill Tracts Regional Council Act, 1998.
<p>Explanations: PS7 is not triggered in the project. There are no indigenous people in the impact zone of the project. Annex-I described the Social baseline of the project. Section 1.15: Socio-economic Resources described the indigenous peoples status of the project area.</p>			
8	Performance Standard 8: Cultural Heritage	No	Antiquities Act, 1968; Convention Concerning the Protection of the World Cultural and Natural Heritage, Paris, 1972 (World Heritage Convention) (Ratified 1983).
<p>Explanations: PS8 is not triggered in the project. Based on current knowledge, there are no known cultural heritage installations in the project impact area. Existing communities in the area do not have significant intangible heritage also. However, any chance find will be dealt with using standard procedure and the PS8 will be triggered. Annex-I described the cultural heritage status of the project area.</p>			

1.6 FORMAT OF ESIA REPORT

The content of the ESIA has been largely structured based on the WB's Operational Policy Statement. The layout of the Report is as follows:

- Executive Summary
- Chapter 1 Introduction, Approach and Methodology
- Chapter 2 Policy, Legal and Administrative Framework
- Chapter 3 Description of the Project
- Chapter 4 Analysis of Alternatives
- Chapter 5 Environmental and Social Baseline Data
- Chapter 6 Anticipated Environmental and Social Impacts
- Chapter 7 Information Disclosure, Consultation and Participation
- Chapter 8 Environment and Social Management Plan (ESMP) and Commitment Plan (ESCP)
- Chapter 9 Recommendations and Conclusions

CHAPTER-2: POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1 INTRODUCTION

To address the environmental and social risks of any proposed project and its associated components; any protect and conserve the environment from any adverse impacts, the GoB has specified regulations, policy and guidelines. Potential Lenders' also have their own set of requirements (such as the WB's Operational Policy and IFC's Performance Standards) to which any project funded by them must operate.

This section focuses on policy, regulations and the administrative framework under the purview of which the proposed project will fall and this ESIA study will be governed, namely:

- ✓ WBG Performance Standards and EHS General and Sector Guidelines.
- ✓ Bangladesh National and Local, Legal and Institutional Framework;
- ✓ Relevant International Best Practice Guideline

2.2 WBG PERFORMANCE STANDARDS

The WBG Performance Standards, which define clients' responsibilities for managing their environmental and social risks are applicable for Private Sector Activities. These Performance Standards are applicable to projects designed, owned, constructed and/or operated by a Private Entity¹ for which the Bank's support is needed. The Performance Standards are directed towards a private entity, providing guidance on how to identify risks and impacts, and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the private entity in relation to project-level activities.

There are eight Performance Standards (PS), which the private entity is expected to meet throughout the life of an investment by WBG:

- **Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts**
- **Performance Standard 2: Labor and Working Conditions**
- **Performance Standard 3: Resource Efficiency and Pollution Prevention**
- **Performance Standard 4: Community Health, Safety, and Security**
- **Performance Standard 5: Land Acquisition and Involuntary Resettlement**
- **Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources**
- **Performance Standard 7: Indigenous People**
- **Performance Standard 8: Cultural Heritage**

The performance standards will be triggered are shown in Table-1.5 with explanations. The project must be managed in a manner consistent and compliant with the World Bank's PSs and applicable guidelines.

Performance Standard (PS) 1: Assessment and Management of Environmental and Social Risks and Impacts

PS 1 describes the importance of an integrated assessment to identifying the environmental and social impacts, risks, and opportunities of the project, an effective community engagement through appropriate and timely disclosure of information and consultation; and the private entity's management of environmental and social performance throughout the project lifecycle. This Performance Standard applies to business activities with environmental and/or social risks and/or impacts, which fits the requirements of BTL Technosity Ltd (**BTL**).

BTL has conducted an environmental and social assessment presented in this report with active collaboration of the stakeholders, and has already established a rudimentary Environmental and Social Management System (ESMS) appropriate to the nature and level of environmental and social risks and impacts assessed; which will be progressively strengthened as necessary. This ESMS includes the following elements: (i) policy; (ii) identification of risks and impacts; (iii) management programs; (iv) organizational capacity and competency; (v) emergency preparedness and response; (vi) stakeholder engagement; and (iv) monitoring and review.

Performance Standard 2: Labor and Working Conditions

PS 2 recognizes that pursuit of economic growth through employment creation and income generation should be accompanied by protection of the fundamental rights of workers. This standard maintains that failure to establish and foster a sound worker-management relationship can undermine worker commitment and retention, can jeopardize a project and hamper its overall sustainability. Guided by conventions and instruments of the International Labour Organization (ILO) and the United Nations (UN).

The objectives of this performance standard are to: (i) promote the fair treatment, non-discrimination and equal opportunity of workers, (ii) establish, maintain and improve the worker-management relationship, (iii) promote compliance with national employment and labour laws, (iv) protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the client's supply chain, (v) promote safe and healthy working conditions, and the health of workers, and (vi) avoid the use of forced labor.

The environmental and social risks of this factor are established during the impacts identification process, and managed through the private entity's ESMS. BTL shall ensure that all identified risks and impacts are managed following international and national standard policies and procedures. These are either documented in this report or included in supporting documents, plans and/or policies to this report.

Performance Standard 3: Resource Efficiency and Pollution Prevention

This standard recognizes that increased economic activity and urbanization often generate increased levels of pollution to air, water and land, and consume finite resources in a manner that may threaten people and environment at the local, regional and global levels. In the light of more efficient and effective resource use and pollution prevention technologies, this performance standard takes a project-level approach to efficiency and pollution prevention and control in line with international best practices.

The levels of emissions for Greenhouse Gases (GHGs) and other recorded pollutants have been measured in this study and the expected levels during BTL plant operation documented in this report as part of an environmental and social risks and impacts identification process. BTL will

consider all ambient conditions and apply technically and financially feasible resources efficiency and pollution prevention techniques best suited to avoid, or minimize adverse impacts on human health and the environment. The abatement measures to be implemented as highlighted in the Environmental and Social Management Plan (ESMP) and other supporting plans are consistent with national environmental laws and internationally recognized sources, including the World Bank Group Environmental, Health and Safety Guidelines (EHS Guidelines).

Performance Standard 4: Community Health, Safety, and Security

The objective of this performance standard is to scope and avoid adverse impacts on the health and safety of the project area during the lifecycle of the project from both direct and indirect project activities. It is also to ensure that property and personnel are safeguarded in a manner that avoids or minimizes risks to the local community especially to vulnerable groups. Following an expansive scoping process and stakeholder engagement, BTL has documented environmental and social risks and impacts affecting the community. Mitigation measures where these impacts can not be avoided have been preferred in the report. Further to this, actions required to meet the requirements of this Performance Standard are managed by BTL's ESMP and ESMS.

Performance Standard 5: Land Acquisition and Involuntary Resettlement

This performance standard recognizes that project-related land acquisition and land use change can have adverse impacts on persons and communities that use this land. Among the objectives of this standard are: (i) to avoid, and when avoidance is not possible, minimize displacement by exploring alternative project designs, (ii) to avoid forced eviction, (iii) to improve, or restore, the livelihoods and standards of living of displaced persons, where applicable (iv) To anticipate and avoid, or where avoidance is not possible, minimize adverse social and economic impacts from land acquisition or restrictions on land use.

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

This Performance Standard addresses how the private entity can sustainably manage and mitigate impacts on biodiversity and ecosystem services throughout the project's lifecycle. The objectives of this performance standard are: (i) to protect and conserve biodiversity, (ii) maintain the benefits from ecosystem services, (iii) promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities.

Scoping during assessment of environmental and social conditions for the BTL project identified modified habitats, which will experience direct and indirect impacts because of the development. Threats to biodiversity and ecosystem services have been mapped in this report and mitigation measures proffered. Implementing measures that ensure resource efficiency and proper utilization of land area to ensure minimal distortion to biodiversity are methods proffered to minimize impacts.

Performance Standard 7: Indigenous Peoples

This standard recognizes that indigenous peoples have identities that are distinct from mainstream groups in national societies, and are often among the most marginalized and vulnerable segments of the population. This performance standard among other things aims to

ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods of indigenous peoples.

Performance Standard 8: Cultural Heritage

This recognizes the importance of cultural heritage (both tangible and intangible) for current and future generations. The requirements for this performance standard on a project's use of cultural heritage are based in part on standards set by the Convention on Biological Diversity. The aim of this performance standard is to protect cultural heritage from the adverse impacts of project activities and support its preservation, and to promote the equitable sharing of benefits from the use of cultural heritage.

2.3 ENVIRONMENT-RELATED LAWS, RULES, POLICIES, GUIDELINES AND INTERNATIONAL CONVENTIONS IN BANGLADESH

The GoB has developed a policy framework that requires environmental issues to be incorporated into economic development planning. The key tenets of the various applicable policies are subsumed in the WBG PS as shown in table-1.5-1 in Chapter-1. So, these are not be discussed in any detail here. However, some highly relevant GOB laws/regulations/guideline are included in Annex-XIX in this document. However, any difference in application will be pointed out if such cases arise.

2.3.1 Other Relevant National Legal Instruments for the Project

Table 2.3-1 presents an outline of other National legal instruments that will have relevance to the proposed Project with respect to the social and environment considerations.

Table 2.3-1 National Legal Instruments relevant to the Project

<u>Act/ Rule/ Law/ Ordinance</u>	<u>Enforcement Agency - Ministry/ Authority</u>	<u>Key Features</u>	<u>Applicability to proposed Project</u>
The Environment Conservation Act, 1995 and subsequent amendments in 2000 and 2002	Department of Environment Ministry of Environment and Forests,	<ul style="list-style-type: none"> • Define Applicability of environmental clearance • Regulation of development activities from environmental perspective • Framing applicable limits for emissions and effluents • Framing of standards for air, water and noise quality • Formulation of guidelines relating to control and mitigation of environmental pollution, conservation and improvement of environment • Declaration of Ecologically critical areas 	Applicable
Environmental Conservation Rules, 1997 and subsequent amendments in 2002 and 2003	Department of Environment Ministry of Environment and Forests	<ul style="list-style-type: none"> • Declaration of Ecologically critical areas • Requirement of environmental clearance certificate for various categories of projects • Requirement of IEE/EIA as per category • Renewal of the environmental clearance certificate within 30 days after the expiry • Provides standards for quality of air, water and sound and acceptable limits for emissions/ discharges from vehicles and other sources 	Applicable Projects falls under Red Category and require environmental clearance
Environment Court Act, 2000 and subsequent amendments in 2002	Ministry of Environment and Forests and Judiciary	<ul style="list-style-type: none"> • GOB has given highest priority to environment pollution • Passed 'Environment Court Act, 2000 for completing environment related legal proceedings effectively 	Applicable for completing environmental legal requirements effectively
he Vehicle Act, 1927; The Motor Vehicles Ordinance, 1983; and The Bengal Motor Vehicle Rules, 1940	Bangladesh Road Transport Authority	<ul style="list-style-type: none"> • Exhaust emissions • Vehicular air and noise pollution • Road/traffic safety • Vehicle Licensing and Registration • Fitness of Motor Vehicles • Parking by-laws. 	Applicable for proposed Project in relation to road transport
Water Supply and Sanitation Act, 1996	Ministry of Local Government, Rural Development and Cooperatives	<ul style="list-style-type: none"> • Management and Control of water supply and sanitation in urban areas. 	Not directly applicable, however, indirectly applicable when considering water usage management and sanitation facilities
The Ground Water Management Ordinance, 1985	Upazila Parishad	<ul style="list-style-type: none"> • Management of ground water resources 	Proposed Project will use surface water source

<u>Act/ Rule/ Law/ Ordinance</u>	<u>Enforcement Agency - Ministry/ Authority</u>	<u>Key Features</u>	<u>Applicability to proposed Project</u>
		<ul style="list-style-type: none"> Installation of tube-wells at any place after license from Upazila Parishad only 	however, should groundwater also be required then licenses will need to be obtained prior to installation of any tube-wells.
The Forest Act, 1927 and subsequent amendments in 1982 and 1989	Ministry of Environment and Forests	<ul style="list-style-type: none"> Categorization of forests as reserve, protected and village forests Permission is required for use of forest land for any non-forest purposes 	Not applicable as proposed Project is not on forest land
The Private Forests Ordinance Act, 1959	Regional Forest Officer, Forest Department	<ul style="list-style-type: none"> Conservation of private forests and for the afforestation on wastelands 	Not Applicable
Bangladesh Wild Life (Preservation) Act, 1974	Ministry of Environment and Forest; Bangladesh Wild Life Advisory Board	<ul style="list-style-type: none"> Preservation of Wildlife Sanctuaries, Parks, and Reserves 	Not applicable as the Project study area does not have any wildlife areas
National Biodiversity Strategy and Action Plan (2004)	Ministry of Environment and Forest Bangladesh Wild Life Advisory Board	<ul style="list-style-type: none"> Conserve, and restore the biodiversity of the country for well being of the present and future generations Maintain and improve environmental stability for ecosystems Ensure preservation of the unique biological heritage of the nation for the benefit of the present and future generations Guarantee the safe passage and conservation of globally endangered migratory species, especially birds and mammals in the country Stop introduction of invasive alien species, genetically modified organisms and living modified organisms 	Applicable for conservation of bio-diversity
National Water Bodies Protection Act, 2000	Town development authority/Municipalities	<ul style="list-style-type: none"> The characterization of water bodies as rivers, canals, tanks or flood plains identified in the master plans formulated under the laws establishing municipalities in division and district towns shall not be changed without approval of concerned ministry 	Applicable due to the proximity to and use of surface water bodies
The Protection and Conservation of Fish Act 1950 subsequent amendments in 1982	Ministry of Fisheries and Livestock	<ul style="list-style-type: none"> Protection and conservation of fish in Government owned water bodies 	Not directly applicable
The Embankment and Drainage Act 1952	Ministry of Water Resources	<ul style="list-style-type: none"> An Act to consolidate the laws relating to embankment and drainage and to make better provision for the construction, maintenance, management, removal and control of embankments and water courses for the better drainage of lands and for their protection from floods, erosion and other damage by water 	Not Applicable

<u>Act/ Rule/ Law/ Ordinance</u>	<u>Enforcement Agency - Ministry/ Authority</u>	<u>Key Features</u>	<u>Applicability to proposed Project</u>
Antiquities Act, 1968	Ministry of Cultural Affairs	<ul style="list-style-type: none"> This legislation governs preservation of the national cultural heritage, protects and controls ancient monuments, regulates antiquities as well as the maintenance, conservation and restoration of protected sites and monuments, controls planning, exploration and excavation of archaeological sites 	Not applicable as the study area does not have any likely cultural heritage or ancient monuments of national or international significance. However in case, any such evidence of archaeological findings arise, the Project will act in consonance to the Act
Administrative and Regulatory Guidelines and Instructions for Land Acquisition	Ministry of Land	<ul style="list-style-type: none"> Regulation of land acquisition process by certain administrative instructions and procedural requirements 	Not applicable
Framework for Leasing of Government (Khas) Agricultural Land	Ministry of Land	<ul style="list-style-type: none"> The rules for allotting and leasing Government-owned (khas) land to land less families 	Not applicable
The Building Construction Act 1952 and subsequent amendments	Ministry of Works	<ul style="list-style-type: none"> This act provide for prevention of haphazard construction of building and excavation of tanks which are likely to interfere with the planning of certain areas in Bangladesh 	Applicable
The Factories Act, 1965 Bangladesh Labour Law, 2006	Ministry of Labour	<ul style="list-style-type: none"> This Act pertains to the occupational rights and safety of factory workers and the provision of a comfortable work environment and reasonable working conditions 	Applicable
Ozone Depleting Substances (Control) Rules, 2004	Ministry of Environment and Forests	<ul style="list-style-type: none"> Ban on the use of Ozone depleting substances Phasing out of Ozone depleting substances 	Applicable
Noise Pollution (Control) Rules 2006	Ministry of Environment and Forests	<ul style="list-style-type: none"> Prevention of Noise pollution Standards for noise levels 	Applicable
Source: Websites of DOE, Legislative and Parliamentary Affairs Division:: Bangladesh Laws and Bangladesh Board of Investment: Business laws			

2.4 APPLICABLE ENVIRONMENT STANDARDS

2.4.1 Ambient Air Quality Standards

The ambient air quality standards shall be applicable only during the construction phase of the project and the wastewater discharges from the project during both construction and operation phases shall be as per the general discharge standards as sector specific standards are not available for this project.

Standards for Ambient Air Quality shall be applicable for construction phase only as no air major polluting process is expected during operation phase of the project.

Ambient Air Quality Standards (AAQS), as notified under Environment Conservation Rules 1997 and revised through Environment Conservation Rules Amendment Rules, 2005 are given in Table 2.4-1 below.

Table-2.4-1 Ambient Air Quality Standards

Pollutant	Time Weighted Average	Concentration in Ambient Air	
		National Industrial, Residential, Rural and other Areas ($\mu\text{g}/\text{m}^3$) (ECR'97)	WHO Guideline Value in $\mu\text{g}/\text{m}^3$
Sulphur Dioxide (SO_2), $\mu\text{g}/\text{m}^3$	Annual*	80	
	24 Hours**	365	125 (Interim target-1) 50 (Interim target-2) 20 (guideline)
	10 minute		500 (guideline)
Nitrogen Dioxide (NO_2), $\mu\text{g}/\text{m}^3$	Annual*	100	40 (guideline)
	1 hour		200 (guideline)
Particulate Matter (size less than $10 \mu\text{m}$) or PM_{10} , $\mu\text{g}/\text{m}^3$	Annual*	50	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline)
	24 Hours**	150	150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)
Particulate Matter (size less than $2.5 \mu\text{m}$) or $\text{PM}_{2.5}$, $\mu\text{g}/\text{m}^3$	Annual*	15	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline)
	24 Hours**	65	75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)
Ozone (O_3), $\mu\text{g}/\text{m}^3$	8 Hours**	235	160 (Interim target-1) 100 (guideline)
	1 Hour**	157	
Lead (Pb), $\mu\text{g}/\text{m}^3$	Annual*	0.5	
	8 Hours	10	

Pollutant	Time Weighted Average	Concentration in Ambient Air	
		National Industrial, Residential, Rural and other Areas (µg/m ³) (ECR'97)	WHO Guideline Value in µg/ m ³
Carbon Monoxide (CO), mg/m ³	1 Hour**	40	

Source: ECR, 1997 (Amendment , 2005)

* Not to be exceeded more than once per year

*Annual average value will be less than or equal to 50 microgram/cubic meter (Ga) Average equal to 150 microgram/cubic meter for one day each year.

* Maximum average value for every one hour each year will be qual or less than 0.12 µg/m³

2.4.2 Water Quality Standards

The designated best use classification as prescribed by DoE for surface water is as given in Table 2.4-2. Table 2.4-3 and Table 2.4-4 highlight standards for drinking water and IFC treated sewage discharge guideline.

Table 2.4-2: Primary Water Quality Criteria for Designated-Best-Use-Classes

Parameters	Unit	Inland Surface Water Quality Standards
Temperature	Centigrade	40
Biological Oxygen Demand (BOD ₅) at 20 ^o C	mg/l	50
Chemical Oxygen Demand (COD)	mg/l	200
Dissolve Oxygen (DO)	mg/l	4.5-8
Total Dissolved Solids (TDS)	mg/l	2,100
pH	-	6-9
Suspended Solid (SS)	mg/l	150
Nitrate	mg/l	10.0
Arsenic	mg/l	0.2
Lead	mg/l	0.1
Chloride	mg/l	600
Iron	mg/l	2
Manganese	mg/l	5
Copper	mg/l	0.5
Oil & Grease	mg/l	10

Source: ECR, Schedule-10

Table 2.4-3: Standards for Drinking Water

Parameters	Unit	DoE (Bangladesh) Standard for drinking water
pH	-	6.5-8.5
Hardness(as CaCO ₃)	mg/L	200-500
Iron	mg/L	0.3-1.0
Chloride	mg/L	150-600
Arsenic	mg/L	0.05
Residual chlorine	mg/L	0.2
Total Coliform	n/mL	0
Fecal Coliform	n/mL	0
Ammonia	mg/L	0.5
Nitrate	mg/L	10
Phosphate	mg/L	6

Parameters	Unit	DoE (Bangladesh) Standard for drinking water
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Source: ECR, Schedule - 3

Table 2.4-4: Treated Sewage Discharge Guideline IFC

S. No.	Parameter	Guideline Value
1	pH	6-9
2	BOD	30 mg/l
3	COD	125 mg/l
4	Total Nitrogen	10 mg/l
5	Total Phosphorus	2 mg/l
6	Oil and Grease	10 mg/l
7	Total Suspended Solids	50 mg/l
8	Total Coliform bacteria	400 MPN/100 ml

Notes: MPN = Most Probable Number

2.4.3 Ambient Noise Standards

Noise standards notified by the MoEF under Environment Conservation Rules, 1997 based on the weighted equivalent noise level (Leq) are as presented in Table 2.4-5. Ambient noise standard by IFC is highlighted in Table 2.4-6.

Table 2.4-5: Ambient Noise Standards

Areas	Day Time (dB A)	Night Time (dB A)
Silence Zone: Zone A	50	40
Residential Area: Zone B	55	45
Mixed Activity Area: Zone C	60	50
Commercial Area: Zone D	70	60
Industrial Area	75	70

The second column of limits values refer to daytime (06:00 to 21:00) and the third column to night time (21:00 to 06:00). A silence zone is defined as an area within 100m, around hospitals or educational institutions.

Table 2.4-6: Ambient Noise Standards by IFC

Receptor	One Hour Leq (dBA)	
	Day Time (07:00 - 22:00)	Night Time (22:00 - 07:00)
Residential, Educational, Institutional	55	45
Industrial and Commercial	70	70

Noise standards in the work environment are specified by Occupational Safety and Health Administration (OSHA-USA) (Table-2.4-7) which in turn is being enforced by Government of Bangladesh (GoB) through model rules framed under the Factories Act.

Table 2.4-7: Standards for Occupational Noise Exposure

Total Time of Exposure per Day in Hours (Continuous or Short term Exposure)	Sound Pressure Level in dB(A)
8	90
6	92
4	95
3	97
2	100
3/2	102
1	105
$\frac{3}{4}$	107
$\frac{1}{2}$	110
$\frac{1}{4}$	115
N	>115

No exposure in excess of 115 dB(A) is to be permitted

2.5 ADMINISTRATIVE FRAMEWORK RELATED TO ENVIRONMENT IN BANGLADESH

The Ministry of Environment & Forests (MoEF) is the nodal agency in the administrative structure of the GoB, for overseeing all environmental matters relating to national environmental policy and regulatory issues in the country. The MoEF oversees the activities of the following technical/implementing agencies:

- ✓ Department of Environment (DOE);
- ✓ Forest Department (FD);
- ✓ Bangladesh Forest Industries Development Corporation (BFIDC);
- ✓ Bangladesh Forest Research Institute (BFRI); and
- ✓ Bangladesh National Herbarium (BNH).

Other Related Organizations

There are several other organizations under the administrative framework, which would govern social and environmental functions related to the proposed Project, namely:

- ✓ Forest Department;
- ✓ Ministry of Land: Land reform and land acquisition directorate; and
- ✓ Local Government Engineering Department (LGED)

2.5.1 Department of Environment (DOE)

The DOE has been placed under the MoEF as its technical wing and is statutorily responsible for the implementation of the Environment Conservation Act, 1995. The Department was created in 1989, to ensure sustainable development and to conserve and manage the environment of Bangladesh.

The principal activities of the DOE are:

- Defining EIA procedures and issuing environmental clearance permits the latter being the legal requirement before the proposed Project can be implemented;

- Providing advice or taking direct action to prevent degradation of the environment;
- Pollution control, including the monitoring of effluent sources and ensuring mitigation of environmental pollution;
- Setting the Quality Standards for environmental parameters;
- Declaring Ecologically Critical Areas (ECAs), where the ecosystem has been degraded to a critical state; and
- Review and evaluation of Initial Environmental Examinations (IEEs) and EIAs prepared for projects in Bangladesh.

2.5.2 Environmental Clearance Process

As mentioned in the Section 2.3.2, ECR has classified projects to be assessed by the DOE in four categories based on the severity of impacts on IECs:

- Green: Nil;
- Orange A: minor;
- Orange B: medium; and
- Red: severe.

The applicability of Environmental clearance and the process in Bangladesh is described in Figure 2.5-1.

The EIA process consists of three stages, screening, IEE, and detailed EIA:

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

The BHTC authority has taken site clearance of the BHTC from DOE. EIA approval is done for the BHTC. However, a separate DOE clearance would be needed for BTL of this project.

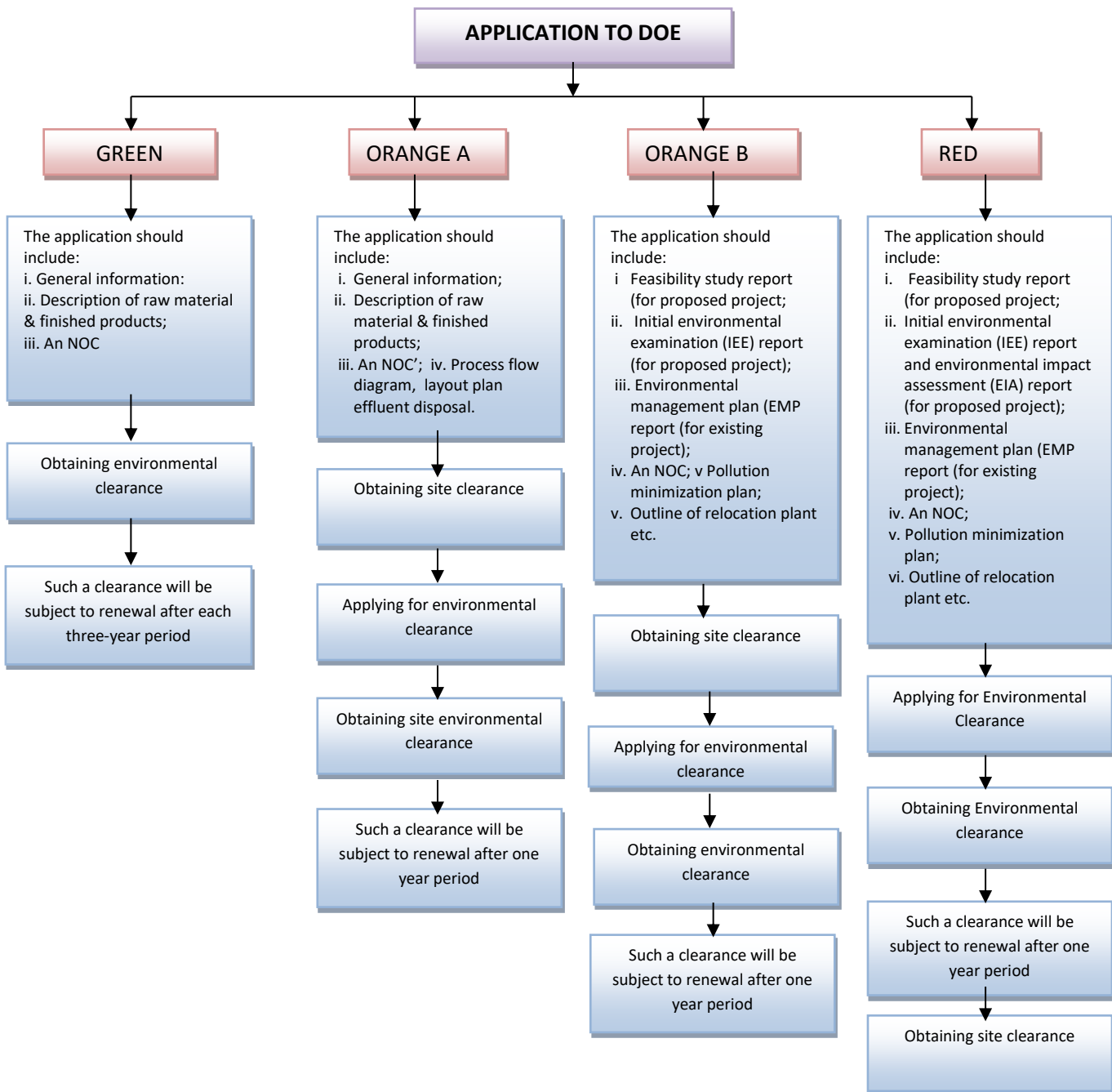


Figure 2.5-1 DOE Environmental Clearance Applicability and Procedure

2.6 INTERNATIONAL TREATIES AND CONVENTIONS

Bangladesh is a party to a number of international environmental convention, treaties and agreements. The international treaties and conventions relevant to the project signed, ratified

and in the process of ratification by Bangladesh are detailed in Table 2.6-1.

Table 2.6-1 Project Relevant International Treaties and Conventions

<u>Environment related International convention and Treaties</u>	<u>Status</u>
International Plant Protection Convention (Rome, 1951.)	01.09.78 (ratified)
Plant Protection Agreement for the South East Asia and Pacific Region (as amended) (Rome, 1956.)	04.12.74 (accessed) (entry into force)
Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar, 1971) ("Ramsar Convention").	20.04.92 (ratified)
Convention Concerning the Protection of the World Cultural and natural Heritage (Paris, 1972.)	03.08.83 (accepted)03.11.83 (ratified)
Convention on International Trade in Endangered Species of Wild Fauna and flora (Washington, 1973.) ("CITES Convention")	18.02.82 (ratified)
Vienna Convention for the Protection of the Ozone Layer (Vienna, 1985.)	02.08.90 (accessed) 31.10.90 (entry into force)
Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal 1987.)	02.08.90 31.10.90 (accessed) (entry into force)
London Amendment to the Montreal Protocol on substances that Deplete the Ozone Layer (London, 1990)	18.03.94 (accessed) 16.06.94 (entry into force)
Copenhagen Amendment to the Montreal protocol on Substances that Deplete the Ozone Layer, Copenhagen, 1992	27.11.2000 (accepted) 26.2.2001 (entry into force)
Montreal Amendment of the Montreal Protocol on Substances that Deplete the Ozone Layer, Montreal, 1997	27.7.2001 (Accepted) 26.10.2001 (Entry into force)
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (Basel, 1989.)	01.04.93 (accessed)
United Nations Framework Convention on Climate Change, (New York, 1992.)	09.06.92 (signed) 15.04.94 (ratified)
Convention on Biological Diversity, (Rio De Janeiro, 1992.)	05.06.92 (signed) 03.05.94 (ratified)
International Convention to Combat Desertification, (Paris 1994.)	14.10.94 (signed) 26.01.1996 (ratification) 26.12.1996 (entry into force)
Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques, (Geneva, 1976.)	03.10.79 (accessed) (entry into force)
Agreement Relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982 (New York, 1994.)	28.07.96 (signed)
Convention on persistent Organic Pollutants, Stockholm	23.5.2001 (signed) 12.03.2007 (ratified)
Kyoto protocol to the United Nations Framework Convention on Climate Change	21.8.2001 (accessed)
Bangladesh has ratified 35 ILO conventions of which 30 are in force, 2 Conventions have been denounced; 3 instruments abrogated; none has been ratified in the past 12 months. - ILO Convention 87 on Freedom of Association and Protection of the Right to Organize - ILO Convention 98 on the Right to Organize and Collective Bargaining - ILO Convention 29 on Forced Labor - ILO Convention 105 on the Abolition of Forced Labor - ILO Convention 138 on Minimum Age (of Employment) - ILO Convention 182 on the Worst Forms of Child Labor - ILO Convention 100 on Equal Remuneration - ILO Convention 111 on Discrimination (Employment and Occupation) - UN Convention on the Rights of the Child, Article 32.1 - UN Convention on the Protection of the Rights of all Migrant Workers and Members of their Families	Those are ratified on 22nd June 1972; 17 Apr 1979; 28 Jan 1998; 12 Mar 2001; 28 Apr 2014; 08-Jun-2017; 08-Jan-2019

Source: DOE

CHAPTER-3: DESCRIPTION OF THE PROJECT

3.1 INTRODUCTION

Bangladesh Technosity Limited (BTL) has been awarded to work as a developer of Block-3 of Bangabandhu Hi-tech City (BHTC) located in Gazipur. As a developer of the park, they planned to build up a number of buildings in Block-3 to attract investments from various IT and Hi-Tech Industries, including IT/ ITES, BPO and Software Development, Hardware and Accessories Manufacturers, Data Center, Multimedia & Animation, Electronic Industry, Bio-Technology, Robotic Engineering, Telecommunications, R&D, Renewable energy, Automobile, Education & Training Institutes etc. In this connection BTL is going to seek fund from Investment Promotion and Financing Facility (IPFF) of World Bank, managed by Bangladesh, with a view to support its development work in the park.

BTL intends to hire the consultancy service for conducting an Environmental and Social Impact Assessment (ESIA) of the proposed development work at the project initial stage to ensure that the proposed project takes environmental concerns into account. The objective of the ESIA of the proposed project is to ensure that neither the development work nor the social and environmental aspects of the project area is compromised through the project activities.

3.2 LOCATION OF THE PROJECT

The site of the BTL project is in Gazipur district and connected to Dhaka-Tangail Highway and Railway. It is around 32 Km away from Dhaka Airport, 8Km away from Savar EPZ and 3Km away from proposed BangaBandhu-1 Satellite transceiver Station. In future it will be connected to the proposed Elevated Expressway.



Figure 3.2-1 Project Location

3.3 PROJECT INFORMATION

Bangladesh is preparing to join a middle income country by 2021. To materialize this vision, Bangladesh Government has taken various initiatives among which development of economic zones is one of them. Bangabandhu Hi-tech City (BHTC) will be the first special economic zone for IT/ITES and Hi-Tech Industry in Bangladesh. The BHTC site is located in Gazipur district which is 32 km away from Dhaka. The site is well connected to the Dhaka-Tangail Highway and Railway and just 8 km away from Savar EPZ. Bangladesh Technosity Limited (BTL) has been awarded to design, develop and operate Block-3 of BHTC Project. Block- 3 is a 40 acres of land where BTL will develop facilities for industries like IT/ ITES, BPO and Software Development, Hardware and Accessories Manufacturers, Data Center, Multimedia & Animation, Electronic Industry, Bio-Technology, Robotic Engineering, Telecommunications, R& D, Renewable energy, Automobile, Education & Training Institutes. The master plan of Block-3 prepared by BTL includes development of the allocated land and construction of a number of multi-tenant buildings (MTB), convention hall, data center, office spaces for IT/ITES, dormitories, food court, training facility, amphitheater, recreational facilities etc. The company will also construct and coordinate industrial facility, assembly line, commercial offices on behalf of the clients in the empty plots. BTL has planned to make Green Buildings providing solar panel at roof top as a renewable energy source, rainwater harvesting system to reduce the water usage, independent sewage treatment plant, LED light fixtures at all the common areas, proper shading device to reduce heat gain inside office space etc. Inclusion of all these features will make the project sustainable.

3.4 DEVELOPMENT PLAN OF THE HI-TECH CITY

The land use plan determines specific uses for definite areas of land allocated for the Hi-Tech City. The objective has been to produce a unified development, which can be built economically, operated efficiently and maintained at normal expense.

The plan has been influenced by the topography of the area. Undulating topographic characteristics made it necessary to consider three alternatives:

- ❖ The land in its natural form can be maintained. This is, however, very difficult because the complex physical requirements of modern living rarely fit the natural form.
- ❖ The natural form may be altered by changing its shape by grading, terracing, or removing natural ground cover or trees. Unfortunately, this approach has been taken too many times in the past without full consideration of the consequences.
- ❖ The most rational approach, however, is to accentuate the essential character of the site, highlighting notable features and letting them determine the form of plan and elevation. This, although more challenging from planning and design points of view, has been followed in the present case.

The land use plan, thus strikes a balance and harmony between nature and the built environment.

Considering the types of companies, which will choose to locate in the area, infrastructure, business and administrative support services that will be required in the Park and the time frame for the implementation of the plan, the whole Park has been divided into five land use blocks. Total area available above 10m contour level has been considered for development to avoid inundation even by a 100 year flood. The land use blocks are described below:

Block-I: This block will have ready to occupy offices, laboratory facilities, incubators and factory spaces for Hi-Tech industries (mainly IT and Electronics). Administrative, business and infrastructural support services including housing provisions, community services and recreational facilities will also be located in this block. Companies having insufficient capital to build their own factories will find this block serving their needs. They can start their business here right away. This block is adjacent to the national highway leading to the Bangabandhu (Jamuna) Bridge and is directly accessible from the Dhaka-Tangail road. The block is relatively flatter which make it more suitable for the types of uses mentioned above. Development of this block will be completed in Phase-I.

Block-II: This block is meant for mixed type of development targeting a broad range of companies including information and communication technology, electronics, as well as companies intending to carry out research and development activities on textiles, garments, plastics, metals and metal products etc. This block will have mainly ready-to-occupy plots for the types of companies mentioned above. This block will be developed in **Phase-II**.

Block-III: Build-to-suit facilities and ready-to-occupy plots will be available for electronics and IT companies in this block. Larger electronics and IT companies needing larger space and wishing to build their own facilities would find this block serving their needs. Smaller companies starting initially in Block-I and growing bigger gradually may find the existing space limited. Such companies faced with the need for expansion would also be able to move to this block. BTL has awarded the Block-III. Area Chart of BLOCK-3 is annexed in Annex-XII.

Block-IV: This block would be reserved exclusively for medical and bio-technology related companies such as medical equipment, medical devices, pharmaceuticals, bio-medical research, agri and food research etc. A separate block has been reserved for such companies because of the need to keep them separate due to the nature of their activities.

Block-V: This is the institutional block which will house the institutions of higher learning for producing highly skilled knowledge workers for industrial and entrepreneurial needs. Institutions focusing on Information Technology, Multimedia and Telecommunications, Engineering, Biotechnology etc. may be set up in this block.

Physical Infrastructure

In Block I, the main building called Hi-Tech Tower I would be housing incubation facilities, ready to occupy office spaces, and required administrative support services. In addition a few ready to occupy plots would also be developed in Block I. The Tower is going to accommodate Banks, Freight services and Clearing and forwarding agency, Medical centre, Multi-cultural cuisine food

courts, single window clearance facilities, conference facilities including video conferencing, fiber optic LAN for high-speed data transfer and Incubators.

The main circular/ring road passing through all the blocks eventually moves towards Block V. Also approached through a second entry, by the side of this road at Block-V, the Hi-Tech University is proposed. The 15-storied building is proposed to accommodate academic buildings, library, seminar/conference hall and classroom facilities.

Water Supply

It is essential that adequate and reliable supply of good quality water is ensured in the Hi-Tech Park. The various uses of water may include drinking, commercial, industrial and recreational. Good quality groundwater (primary data provided in Environmental and Social Baseline Section) is available in and around the project site. There is no source of surface water nearby which can be used. It is therefore, suggested that groundwater shall be used as the source of water supply in the proposed Hi-Tech City.

In Madhupur tract area (Gazipur and Mymensingh) the aquifer lies at a depth between 80 -200 ft. The Discharge Capacity of DTW of Gazipur District is 1.25-1.5cusec and the well spacing recommended 1800ft to 2800ft where radius of interference (R) would be 900 to 1400ft. The transmissivity (using drawdown, distance draw-down and time recovery method) of DTW observed in Gazipur is 508.48 m²/day which is too minimum. In Gazipur, the groundwater has been lowered about 9.75 m during 2006 to 20011, which indicates that groundwater utilization by using tube-wells has already been limited for agricultural purpose in this district. (Source: "Final Report on Detection of Zone of Influence of Deep Tubewell (DTW) and Shallow Tubewell (STW)" of BADC, June 2015). Thus, in future the Hi-Tech City should find a surface water source for its water supply.

Initially, two 8" power driven deep tube-wells shall be installed - one in Block I and the other in Block V. Pump houses shall be constructed at each well location and water will be directly pumped to user ends through two separate pipe networks in two blocks. Two additional deep tube-wells shall be installed in two blocks at some later stage that will serve the purpose of standby pumps according to need.

Eventually, as the development of the Park progresses, the entire area shall be covered by a full-fledged, modern piped water supply system with provisions for water reserves in the proposed overhead water tank in **Block II** to be built in **Phase II**.

Sewerage

Ready-built spaces, administrative service areas, incubation facilities, educational institution, housing and other community facilities will be provided with modern water and wastewater appliances. Wastewater that will be generated in the Hi-Tech Park will be disposed of in a manner that is technically efficient, economically viable and environmentally sound.

The BHTC authority has already built a ETP for wastewater treatment; but the collection wastewater collection system is still not in place. For the interim period until a collection system in place, BTL will built wastewater treatment plants to manage its wastewater. For the time being,

the domestic wastewater disposal system at the Hi-Tech Park complex would consist of septic tank-soak pit arrangements. The efficiency of these systems should be regularly monitored. BHTC might start with small capacity sewage system which may be expanded as need arises. In the Google Satellite Image, the built up Sewage Treatment Plant (STP) has been shown in Figure-3.4-1 and relative location of Block-3. Individual industries producing waste/wastewater (if any) must take appropriate steps following the guidelines set in ECR 1997.

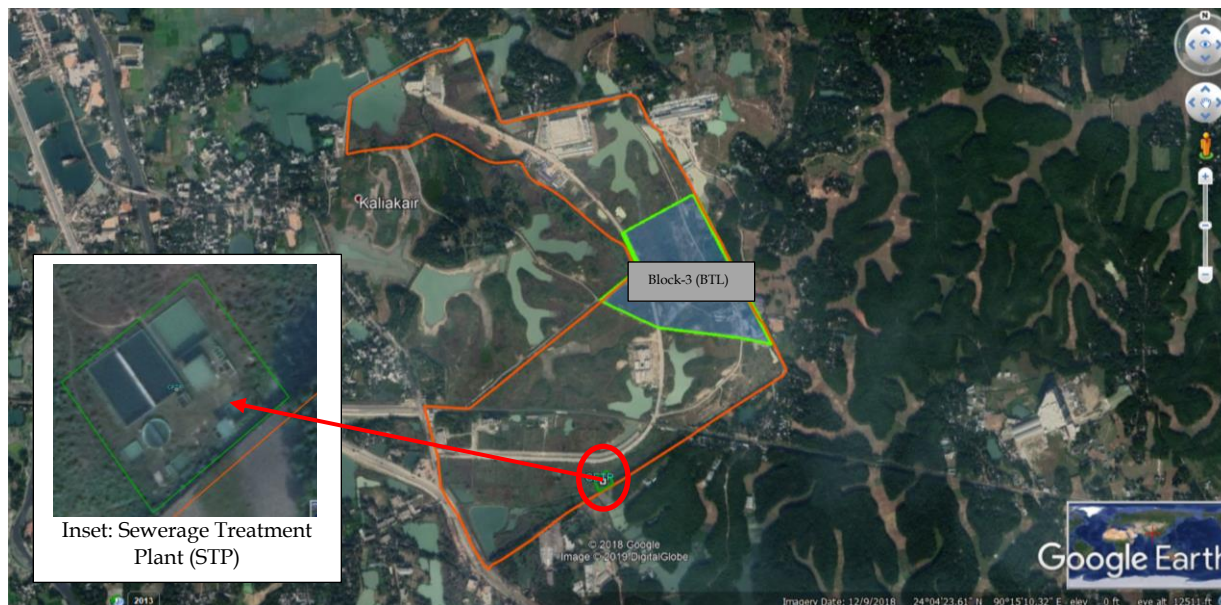


Figure-3.4-1 STP location in the BHTC (Green Boundary is Block-3)

Drainage and Flood Control

Storm runoff generated from the project area would be drained through natural drainage paths. These drainage paths are through ditches and low-lying areas. The project area is close to the Dhaka city and the rainfall is not much different from that in the Dhaka city.

The design intensity-duration-frequency (IDF) curve that has been used in the master plan of storm drainage in the Dhaka Metropolitan area, may therefore be used for designing drainage channel in the project area.

A planning decision is that the areas above 8.91m PWD elevation which is the recorded highest flood level during last 52 years, would be utilized to construct buildings and roads. It is recalled that the river water level of 10.5m PWD is close to the 100-year flood level.

Power Supply

Among all of the common facilities, power and communication are two vital facilities for the proposed BTL. Bangladesh Technosity Limited (BTL) is one of the developers of BHTCA responsible for block-3 of Bangabondhu Hi-Tech Park City. BTL's responsibility is to organize utility facility for the tenants of Block-3. BTL organized an un-interrupted electricity line for 5MW from BHPTA. So the company was allotted with 2.5 MW and the remaining will be allotted within September 2019. As the company completes the further construction more electricity supply will

be required and will be provided by BHTCA according to the arrangement between these two parties. These diesel generators could be quite polluting in respect of PM2.5 emission; but these will be kept standby for power outage only and will not be operated continuously. In practice, power outages are infrequent and thus these generators are not likely to contribute substantially to air emissions.

The back-up electricity supply system's responsibility for the tenants of BTL lies with individual tenant. So far, BTL itself has organized back-up generator system for 2 MW and other tenants of the company have organized 6.3 MW of back-up generator system.

At the medium voltage level, the nearest power source for the Park would be Joydevpur and Mirzapur 33 kV substations. 11 kV lines have to be drawn from both the substations in order to provide the redundancy in the source. Three 33/11/0.4 kV substations have to be built in three different location of the proposed Park.

Roof Top Solar Panel as Renewable Energy:

The total area of Block 3 will be 40 acres. As per building code one-third of the total land which is 14.4 acre need to be allocated for roads, pavement etc. Therefore, the land size for constructing building will be 25.6 acre where 22 acre of space will be available on the rooftop. Here, 50% of the roof top space may allocate for outdoor of air-conditions, chillers, spaces between solar panel, angels to get proper solar light and others. The solar panel, size of 4 acres can produce 1 MW electricity. In this regard, BTL will get 10-11 acre approx. to produce 2.5 to 2.75 MW electricity.

3.5 TARGET INDUSTRY

BTL targets to manage the following industries:

- IT/ ITES
- BPO & Software Development
- Hardware & Accessories Manufacturers
- Data Center
- Multimedia & Animation
- Electronics Industry
- Bio-Technology
- Robotic Engineering
- Telecommunication
- R&D
- Renewable Energy
- Automobile
- Education & Training institutes

3.6 PROJECT ACTIVITIES

In the project, Master Plan the BTL will carry out the following activities:

- Product & Services

- 01 Signature Multi-Tenant Building
- 01 Landmark MTB Convention Hall
- 01 Data Center Building
- 05 Standard Multi-Tenant Buildings
- 34 Different Sized Open Plot

■ Facilities

- Office space for IT/ITES
- Convention Hall
- Industrial Plots
- Data Center
- Dormitories
- Training Facility
- Food Courts
- Amphitheater
- Recreational Facilities

BTL will also construct and coordinate industrial facility/ assembly line/ commercial offices on behalf of the clients in the empty plots.

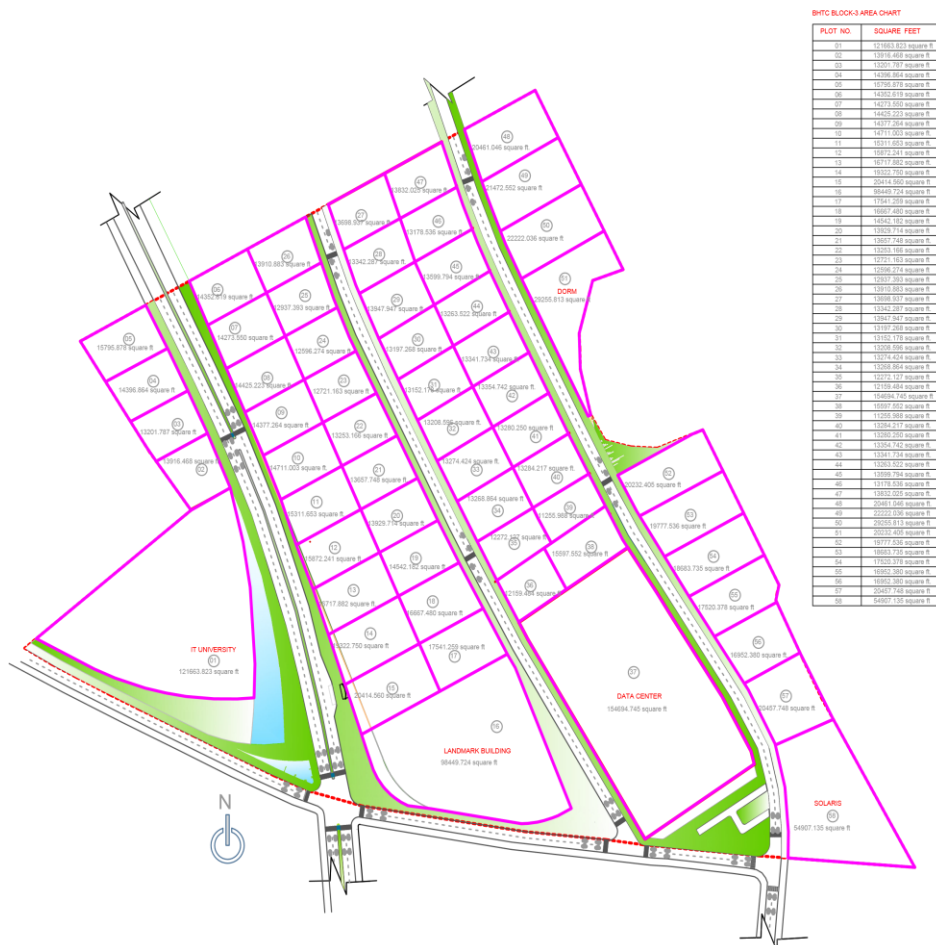
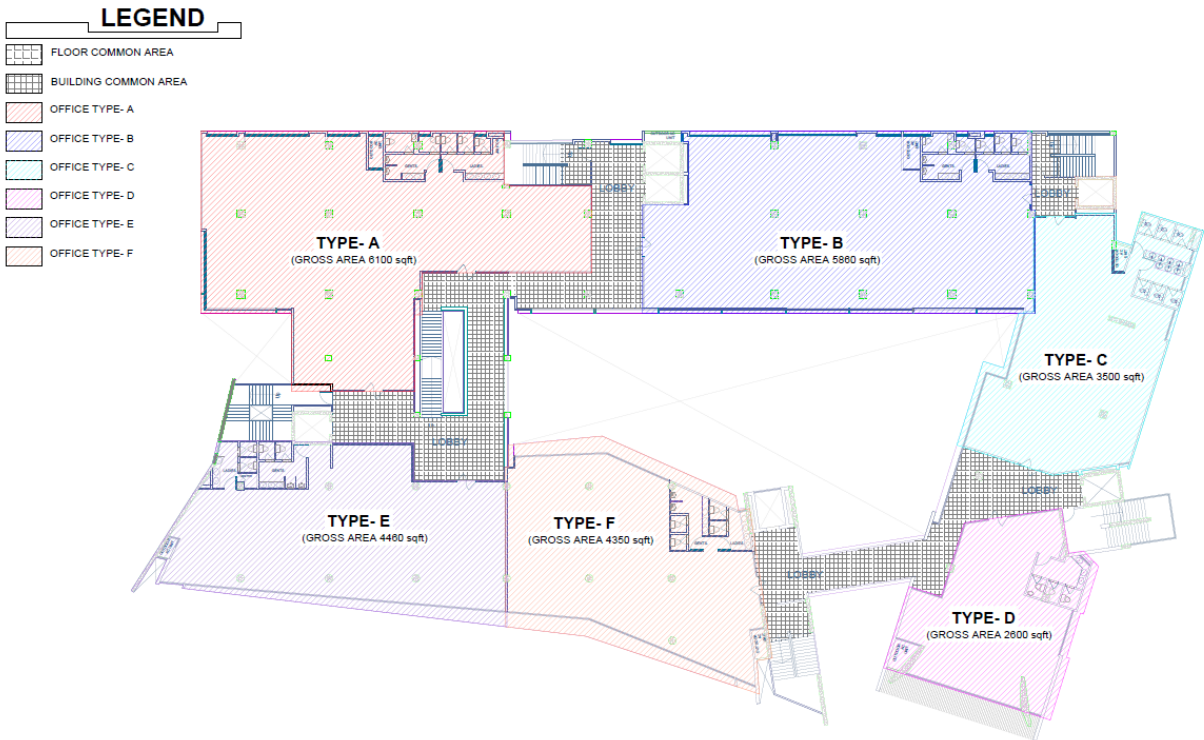
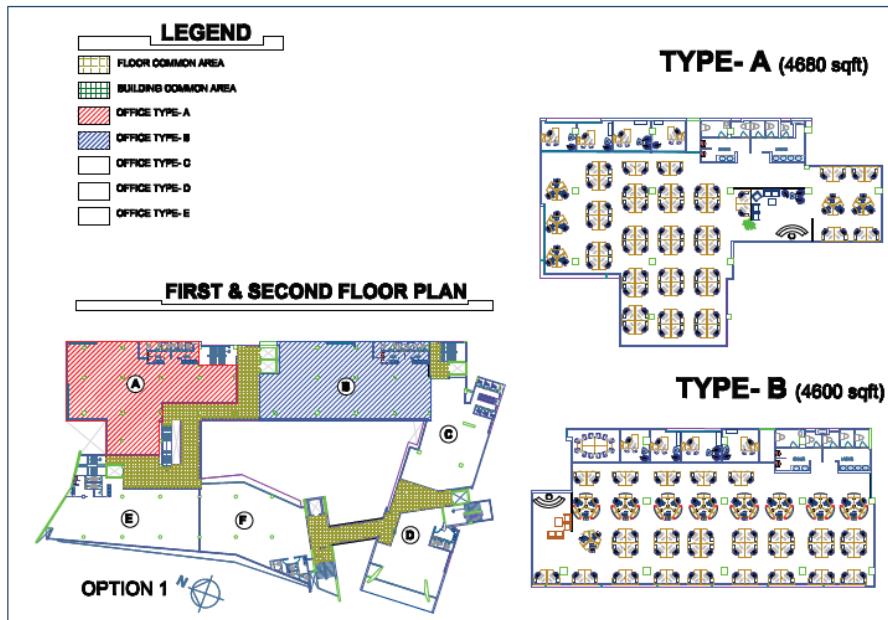


Figure- 3.6-1: Site plan for Block-3 allotted to BTL by BHTC Authority



1st FLOOR PLAN



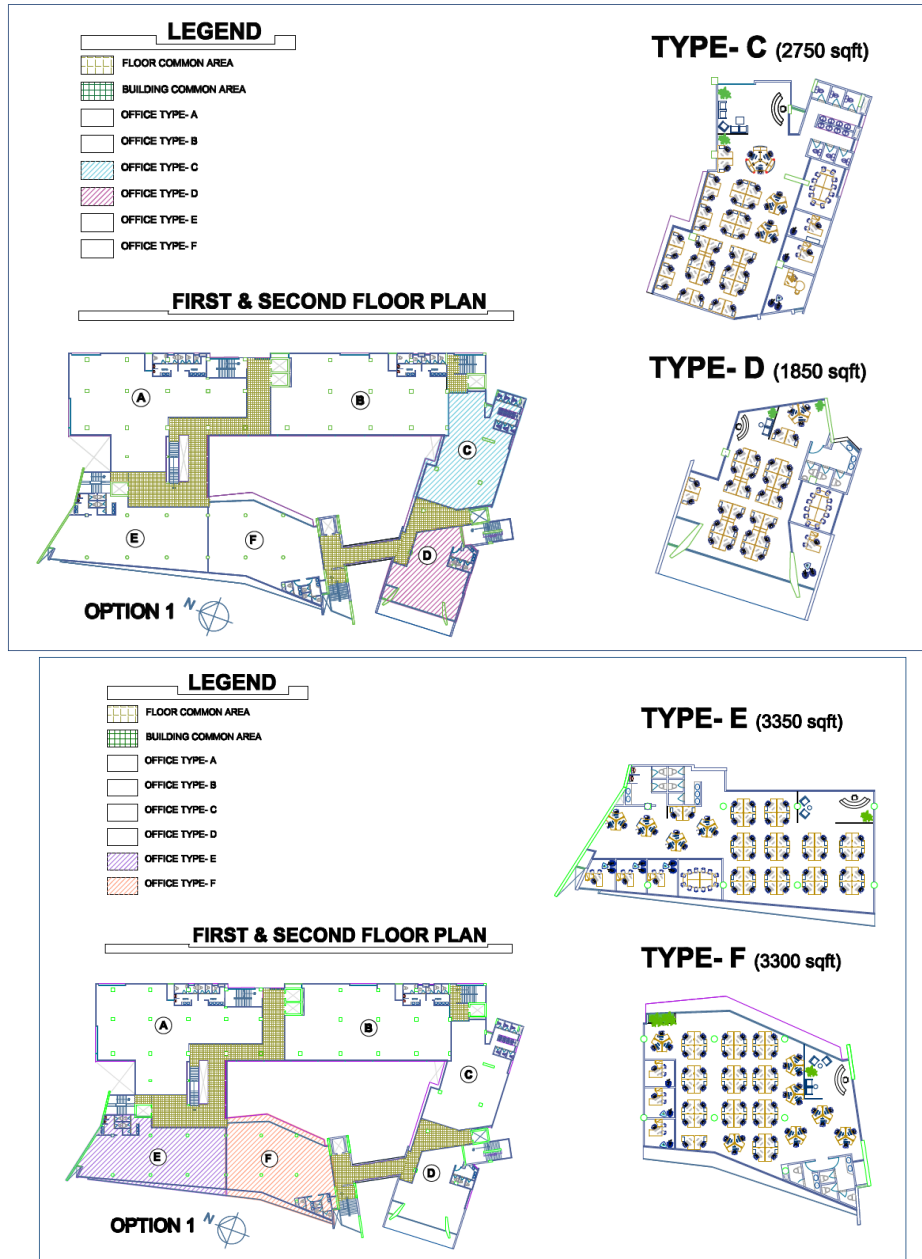


Figure-3.6-2 Plan of the BTL Project



Photo: 3D View of the Landmark MTB

Current Status of the Project:

- BTL is ahead of schedule as per the commitment(s) in the Concession Agreement with the BHTCA. To initiate the development of Block 3, the Group has already injected equity amount BDT 267.0 million.
- Completed rentable space of around 207,000 SFT. Out of which 25,000 SFT has already been rented out with effect from May 2019.
- The Master Plan for Block 3 development includes a number of MTBs, Industrial Sheds for factories/assembly plants, Restaurants, Gymnasium, and Data Center etc.
- The entire 40 acres of land area in Block 3 will soon be landscaped to create some aesthetic beauty of the environment and for the demarcation of available plots.
- Simultaneously, the BHTCA are continuing on with infrastructure works to support the BHTC, e.g. Internal Roads, Water Reservoir, Effluent Treatment Plan, Drainage Systems, Power Supply etc.
- Bangladesh Railway (BR) has already completed the construction of Rail station and inaugurated.



Current Status of Construction work in Photos

3.7 PROJECT SCHEDULE & COSTING

The total CAPEX of the project is estimated 2,137.89 Million BDT. BTL has already completed 22-25% of its project works. Details of the project CAPEX is listed in Table-3.7-1.

Table-3.7-1: CAPEX of Block-3 Project

Item	Nos.	Vertical Units	Buildable Area (SFT)	CAPEX per BDT/SFT	Total CAPEX (Mn BDT)	Total CAPEX (Mn \$)	%
General Land & Park Development	-	-	1,742,000	60	102.11	1.22	4%
Landmark MTB	1	10	108,875	2250	195.94	2.33	10%
Landmark MTB-Convention Hall	1	3	42,461	2100	89.17	1.06	4%
Data Center Building	1	3	45,728	3450	157.76	1.88	7%
Data Center Equipment	0	3	45,728	4340	198.46	2.36	8%
Standard MTB	5	8	373,659	1600	597.85	7.12	25%
Type A-1 Acre Plot with Utility Connection	8	1	348,400	140	47.65	0.57	2%
Type B-2 Bigha Plot with Utility Connection	8	1	232,267	140	31.77	0.38	1%
Type C-1 Bigha Plot with Utility Connection	18	1	261,300	140	35.74	0.43	2%
Landscaping Development	1	1	261,300	100	25.53	0.30	1%
ROAD	1	1	456,840	170	75.87	0.90	3%
Logistics	1	1	1,742,000	30	49.23	0.59	2%
Other Investment	-	-			171.60	2.04	4%
Pre-Operation Expense					90.74	1.08	5%
IDCP					268.46	3.20	20%
Total			3,918,556		2,137.89	25.45	100%

The project has started its work from June 2016 and will be completed the construction work by August 2022. Annex-XX detailed out the project activities with Schedule.

Present Activities: At present, the activities in the project area are development of Common Infrastructure (General Land & Park Development, Type A-1 Acre Plot with Utility Connection, Type B-2 Bigha Plot with Utility Connection, Type C-1 Bigha Plot with Utility Connection, Landscaping Development, Road & Logistics), landmark MTB (Solaris West Building, Solaris East Buildings, Solaris South Building) and other investment (Steel structured building) under CAPEX. The progress of the construction works are listed in Table-3.7-2.

Table-3.7-2: Work progress of Construction Activities under land and park development item of CAPEX.

Work Progress Report as on 20 March, 2019

Working Area	Work Progress	Work Volume
Common Infrastructure	Land acquisition	100% Completed
	Offsite infrastructure	100% (Road and Rail Connectivity)
	Land Development	38% Completed
	Onsite infrastructure	35% Completed
	Civil Construction	40% Completed
Solaris West Building	i) Civil Works: Civil Work completed. ii) Brick Works: Brick & Plaster Works completed. iii) Floor Finishing: Floor finishing works going on and shall be completed very soon. iv) Electro Mechanical works: Lift Installation work is going on and will be completed very soon. Electrical wiring also going on. v) Thai Aluminum & Glass Works: Thai Aluminum Installation work is going on and will be completed very soon. vi) Sanitary Works: Sanitary & Plumbing work is going on and will be completed very soon.	i) Civil Works: 100% ii) Brick Works: 100% iii) Floor Finishing: 90% iv) Electro Mechanical works: 90% v) Thai Aluminum & Glass Works: 90% vi) Sanitary Works: 90%
Solaris East Building	i) Civil Works: Civil Work completed. ii) Brick Works: Brick & Plaster Works completed. iii) Floor Finishing: Floor finishing works going on and shall be completed very soon. iv) Electro Mechanical works: Lift Installation work is going on and will be completed very soon. Electrical wiring also going on. v) Thai Aluminum & Glass Works: Thai Aluminum Installation work is going on and will be completed very soon. vi) Sanitary Works: Sanitary & Plumbing work is going on and will be completed very soon.	i) Civil Works: 100% ii) Brick Works: 100% iii) Floor Finishing: 90% iv) Electro Mechanical works: 90% v) Thai Aluminum & Glass Works: 90% vi) Sanitary Works: 90%
Solaris South Building	i) Civil Works: Civil Work completed. ii) Brick Works: Brick & Plaster Works completed. iii) Floor Finishing: Floor finishing work is going on and shall be completed very soon. iv) Electro Mechanical works: Lift Installation work is going on and will be completed very soon. Electrical wiring also going on. v) Thai Aluminum & Glass Works: Thai Aluminum Installation work is going on and will be completed very soon. vi) Sanitary Works: Sanitary & Plumbing work is going on and will be completed very soon.	i) Civil Works: 100% ii) Brick Works: 100% iii) Floor Finishing: 95% iv) Electro Mechanical works: 95% v) Thai Aluminum & Glass Works: 95% vi) Sanitary Works: 90%
Steel structured building	i) Civil Works: Civil work of Foundation, Gread Beam & columns are completed. Total area each of floor is 27,800 Sft. ii) Brick Works: Brick works below grade beams are completed. Brick works above gread beams are going on iii) Steel Framing: Fitting & fixing of all cloumns & beams are completed. others steel materials fixing are going on. iv) Electro Mechanical works: Electrical will be started very soon.	i) Civil Works: 100% ii) Brick Works: 85% iii) Steel Framing: 70% iv) Electro Mechanical works: 0

Future Activities:

The implementation schedule of BTL is divided into 3 phases to develop block 3. BTL has already completed phase 1. Now, BTL is going forward to complete phase 2 & 3 and final handover. In phase 2, BTL will perform Multi-Tenant Building (MTB) 4 and Multi-Tenant Building (MTB) 5 and it will require 750 and 720 days respectively to complete the whole construction work properly.

After completing phase 2, BTL will spend 720 days for phase 3 for constructing MTB 6. After completing all the MTB's, BTL will do complete the handover session.

Table-3.7-3 Future activities of BTL project

Task name	Duration	Start	Finish	Predecessors
Phase-2	990 days	Fri Sep 14, '18	Wed Jun 29, '22	
Block-3	990 days	Fri Sep 14, '18	Wed Jun 29, '22	
Construction work	990 days	Fri Sep 14, '18	Wed Jun 29, '22	
MTB-4	750 days	Fri Sep 14, '18	Wed Jul 28, '21	
Preparation of design document	60 days	Fri Sep 14, '18	Thu Dec 6, '18	66FF
Construction of sub structure	90 days	Fri Dec 7, '18	Wed Apr 10, '19	73
Construction of super structure	180 days	Thu Apr 11, '19	Wed Dec 18, '19	74
Installation of electro-mechanical component	180 days	Thu Dec 19, '19	Wed Aug 26, '20	75
Installation of external envelope	180 days	Thu Dec 19, '19	Wed Aug 26, '20	75
Interior finishing	210 days	Thu Aug 27, '20	Wed Jun 16, '21	77
Commissioning and handover	30 days	Thu Jun 17, '21	Wed Jul 28, '21	75,76,77,78
MTB-5	720 days	Thu Sep 26, '19	Wed Jun 29, '22	
Preparation of design document	60 days	Thu Sep 26, '19	Wed Dec 18, '19	75FF
Construction of sub structure	90 days	Thu Dec 19, '19	Wed Apr 22, '20	81
Construction of super structure	180 days	Thu Apr 23, '20	Wed Dec 30, '20	82
Installation of electro-mechanical component	180 days	Thu Dec 31, '20	Wed Sep 8, '21	83
Installation of external envelope	180 days	Thu Dec 31, '20	Wed Sep 8, '21	83
Interior finishing	180 days	Thu Sep 9, '21	Wed May 18, '22	85
Commissioning and handover	30 days	Thu May 19, '22	Wed Jun 29, '22	82,83,84,85,86
Phase-3	720 days	Thu Sep 26, '19	Wed Jun 29, '22	
Block-3	720 days	Thu Sep 26, '19	Wed Jun 29, '22	
Construction work	720 days	Thu Sep 26, '19	Wed Jun 29, '22	
MTB-6	720 days	Thu Sep 26, '19	Wed Jun 29, '22	
Preparation of design document	60 days	Thu Sep 26, '19	Wed Dec 18, '19	75FF
Construction of sub structure	90 days	Thu Dec 19, '19	Wed Apr 22, '20	92
Construction of super structure	180 days	Thu Apr 23, '20	Wed Dec 30, '20	93
Installation of electro-mechanical component	180 days	Thu Dec 31, '20	Wed Sep 8, '21	94
Installation of external envelope	180 days	Thu Dec 31, '20	Wed Sep 8, '21	94
Interior finishing	180 days	Thu Sep 9, '21	Wed May 18, '22	96
Commissioning and handover	30 days	Thu May 19, '22	Wed Jun 29, '22	93,94,95,96,97
Handover	112 days	Thu Apr 7, '22	Fri Sep 9, '22	
Commissioning of all logistics	30 days	Thu Apr 7, '22	Wed May 18, '22	42FF,97FF
Preliminary inspection	30 days	Thu May 19, '22	Wed Jun 29, '22	100
Test run of all logistics	15 days	Thu Jun 30, '22	Wed Jul 20, '22	101
Rectification, if any	30 days	Thu Jul 21, '22	Wed Aug 31, '22	102
Handover of the project	7 days	Thu Sep 1, '22	Fri Sep 9, '22	103

CHAPTER-4: ENVIRONMENTAL AND SOCIAL BASELINE

4.1 PROJECT LOCATION

The BTL project site is located at Uttar Baktarpur village of Kaliakoir Union. The 10 km study area map is shown in Figure-4.1-1. The study area is situated at Kaliakair and Gazipur Sadar upazila of Gazipur district, and Dhamrai and Savar upazila of Dhaka districts.

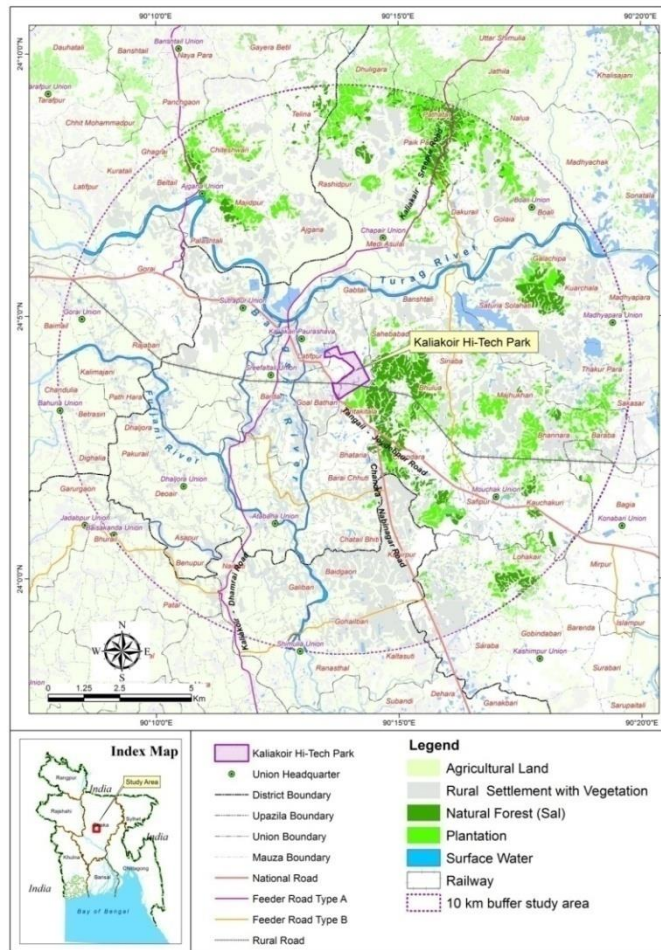


Figure-4.1-1 BTL Project Site in GIS Map

The proposed BHTC is having all the infrastructure facilities like electricity, gas, telephone, national highway, river transport and railway etc. The project location has got a good communication network with other parts of the country. The Bangshi River passes through adjacent to the site. The Bangshi river is connecting with the Turag River. The river has good navigation facility in the rainy season but limited navigation facility the dry season.

4.2 TOPOGRAPHY AND FLOODING POTENTIAL

The study area mostly lies in flat topography. Presently, the area is dominated by agricultural practices followed by settlements, forest, fishing during wet season. According to the Digital Elevation Model and Area Elevation curve, land elevation of the proposed Project site ranges

between 3.7-12.5 m PWD. Analyses of the historical water level data of Kaliakoir (Strn. ID 301) shows that the maximum water level reached at about 8.91m PWD. Since 1988 which was an extreme flood event in Bangladesh. The concerned study area is prone to occasional riverine flood but the project area has been developed considering 100 years flood level analysis.

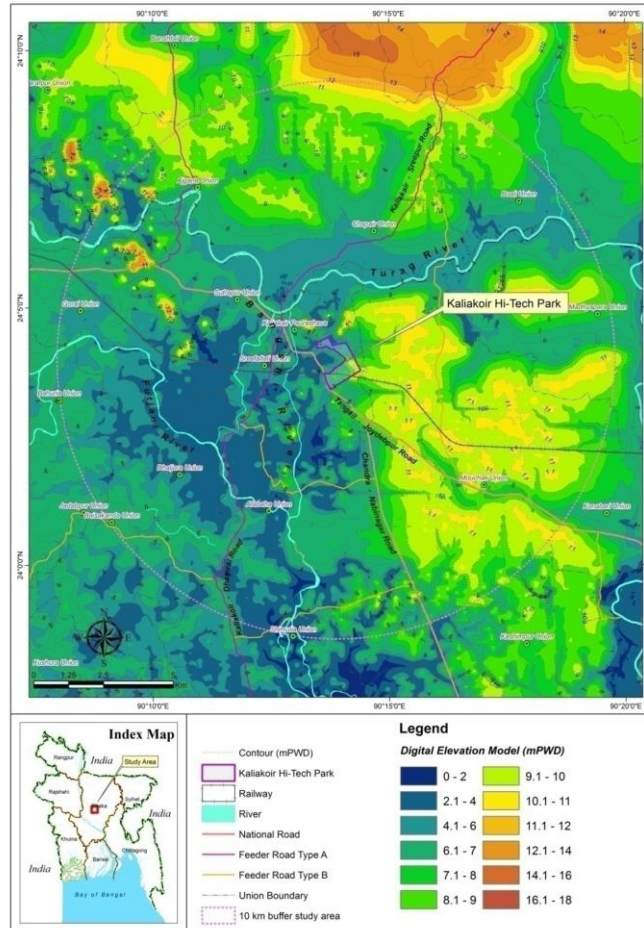


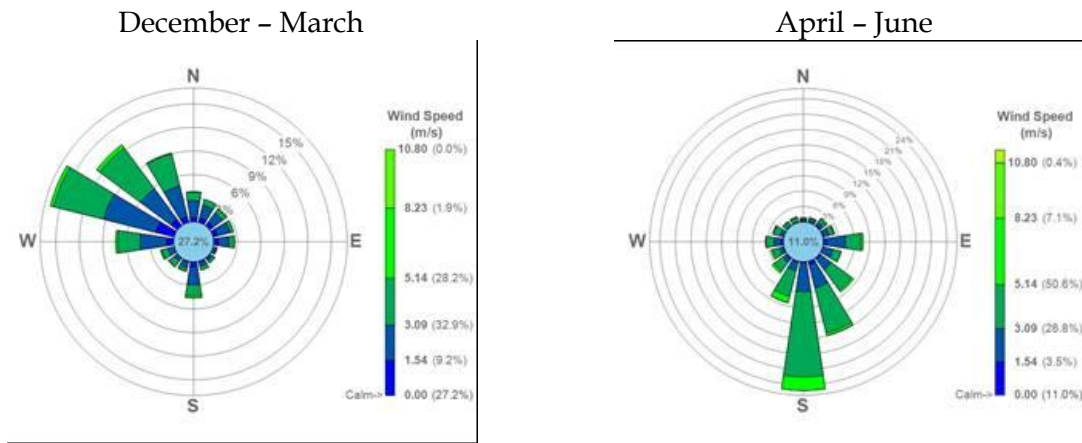
Figure-4.2-1 Digital Elevation Map of the Study Area

4.3 GROUND AND SURFACE WATER QUALITY

Ground water quality of April 2019 data comply with the National drinking water standards. Dry seasons surface water quality data of December last year was not available in the BWDB so the data for a full hydrological cycle (year) was not possible to analyze for this study. Similarly, the surface water quality data of full hydrological cycle was not possible to analyze due to unavailability of dry season data of BWDB. Comparison of the field-tested data of April 2019 with the surface water quality standards reveal the fact that water from the surface water bodies are fit for potable water supply after conventional treatment, usable for fisheries, Industrial process and cooling water requirement of industries and for irrigation. Surface & Ground Water sampling and analysis are detailed out in Annex-I of Volume-II of the ESIA report.

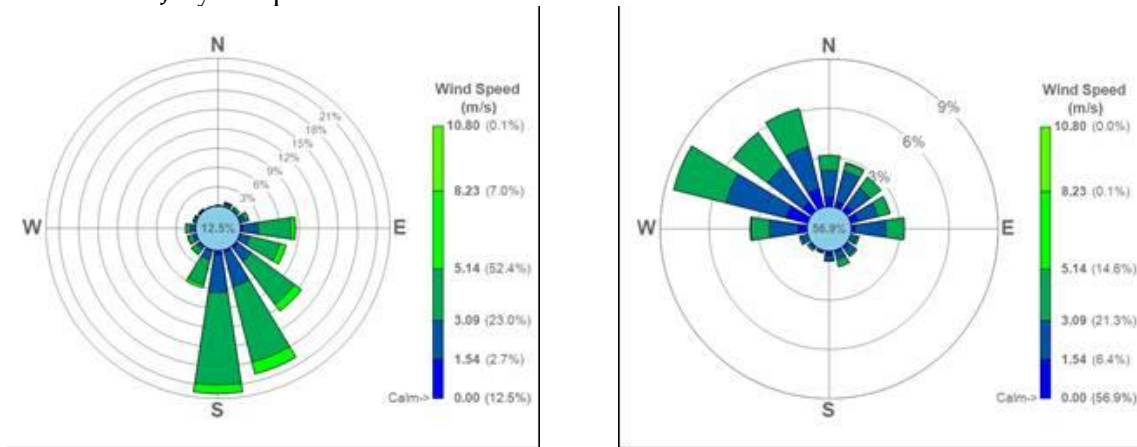
4.4 WIND SPEED AND DIRECTION

The direction of wind varies depending on the seasons. Therefore, whole year has been categorized into four clusters of months and these are: Cluster-1: December-March, Cluster 2: April-June, Cluster 3: July to September, and Cluster 4: October to December. Wind speed data and direction have been collected from the Dhaka BMD station at a height of 10 m from the ground level. During clusters 1 and 4 months wind direction is predominantly from northwest to southeast direction, inclined towards east and for clusters 2 and 3 it is predominantly from south and southeast to north and northwest. In cluster 1 calm wind prevails for 27.2% of total period, similarly it is 11.0% for cluster 2, 12.5% for cluster 3, and 56.9% for cluster 4, respectively. Figure 4.4-1 (a, b, c and d) present wind speed and direction graphically round the year.



(a): Wind rose diagram for December-March
July – September

(b): Wind rose diagram for April-June
October – December



(c): Wind rose diagram for July-September

(d): Wind rose diagram for October-December

Figure 4.4-1: Wind Rose at Dhaka Station

4.5 AIR QUALITY

There is a CAMS (Continuous Air Monitoring Station) belonging to DOE at Gazipur which is in the same air-shed considering weather parameters. In order to compensate for the local sources, the Gazipur CAMS data (2018) have been normalized using the site-based measurements. The data shows the general trend of high PM_{2.5} levels during dry period (November–April) in most areas of the country. There are no significant point sources of air emission within 10 km of the project site and hence the air pollutants in the area transported from other areas.

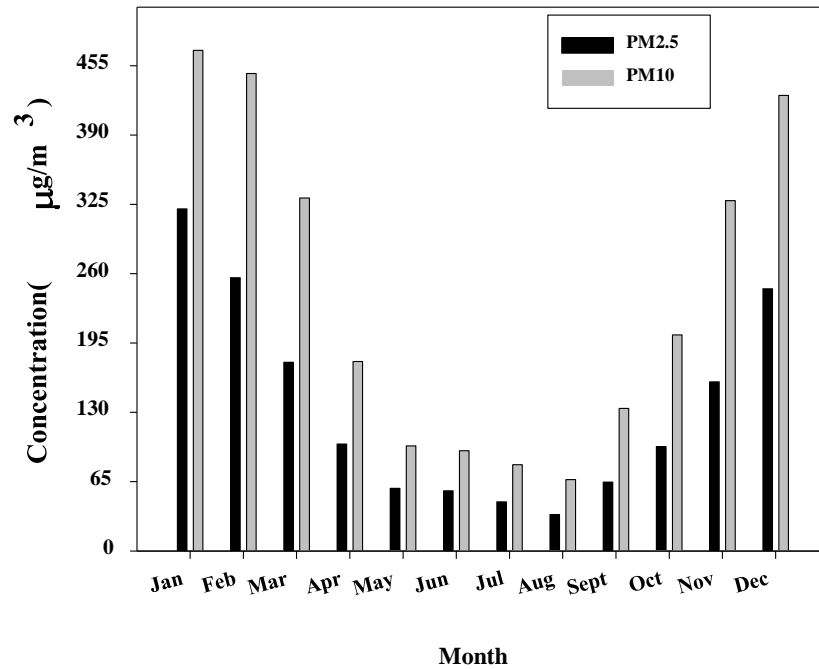


Figure-4.5-1: Yearly plot for ambient PM₁₀, PM_{2.5} concentrations at the Project site using normalization procedure

Ambient air quality of the project area:

PM_{2.5}&PM₁₀

Four days ambient PM₁₀, PM_{2.5}, concentrations are higher than the yearly average Bangladesh National Ambient Air Quality Standards. As the project is now in the construction stage so the PM_{2.5} seems always higher in the sample analysis. PM₁₀ looks much better for the 24 hour standards which is due to the wet season sampling.

SO₂

The 24-hourly SO₂ concentration was recorded in the range of 8.02–27.45 µg/m³. Average concentration of SO₂ is reported much lower due to the agricultural setup. SO₂ concentration at project location was reported well below of 365µg/m³, which is a 24-hourly National Ambient Air Quality Standard (NAAQS) for SO₂ in Bangladesh. The results were also compared with the WHO guideline values for SO₂ and it is noted that the average SO₂ concentrations at the park is a bit higher than the stipulated guideline value (20µg/m³).

NO_x

The 24-hourly NO_x concentration was recorded in the range of 10.3 – 42.6 µg/m³. During the monitoring period, the maximum NO_x concentration is reported at BHTC site as 0.076 mg/m³. There are no stipulated standards for 24-hourly NO_x concentration in Bangladesh and also there is no WHO guideline value for the same. The annual Bangladesh standard and WHO guideline value for NO_x are 100 µg/m³ and 40 µg/m³ and present average concentration at the BHTC is well below these values.

CO

Average concentration of CO is reported low at the monitoring location while comparing with the Bangladesh Standards as well as WHO guideline (10 mg/m³).

Air sampling and analysis are detailed out in Annex-I of Volume-II of the ESIA report

CO₂ Emission from 5MW Power Plant:

In the project, 5MW generator shall be installed for the power supply of the BTL facilities. The power of the generator will be the diesel. The estimated carbon emission for the 5MW power plant is calculated below:

As per Table 4–Typical CO₂ emissions performance of new thermal power plants of IFC guideline of “Environmental, Health, and Safety Guidelines for Thermal Power Plants-May/June-2017”, the CO₂ emission of <3000MWe will be ranged 823gm/kWh for Simple Cycle technology oil driven power plant.

Therefore, for the 5MW power generation the carbon emission would be:

$$= 5000 \times 0.823 \text{ kg CO}_2/\text{hour}$$

$$= 4115 \text{ kg CO}_2/\text{hr.}$$

To abate the Generator generated Carbon emission, BTL will install 2.5 to 2.75 MW capacity of rooftop solar system on the project building.

4.6 ACOUSTIC ENVIRONMENT

Noise levels were recorded at four corners of the study area during the monitoring period. The monitoring data of the project study area is compliant with the National Noise Level Standards (ECR1997). Noise level data and analysis are detailed out in Annex-I of Volume-II of the ESIA report

Envisaged sound level at the Project Area:

Source of Noise: Generator in Block-3.

Residential Area: 1500m from the Generator in Block-1.

Assuming 4MW power will be generated by a generator of Block-3. The reference sound level at 1m distance from the generator would be 110dB. So, calculated sound level at the receptor of residential area would be 47dB which is within the WB and DOE guidelines and standards.

4.7 GEOLOGY, SEISMICITY & CYCLONE

As per tectonic classification, the area falls under Madhupur Tripura threshold of eastern platform flank of the Bengal basin. Tectonically this area is inactive and no apparent major structure like fault or fold exists in the region that might be geologically significant. According to the records, collected and reviewed, the project site falls in an area from where the nearby known earthquake epicenter has been at least 50 Km distant and the nearest position of magnitude of about 6 has been encountered hundreds of Kilometers away. Therefore, the area is not depicted as lying on an earthquake prone area nor the area has any active tectonic movement to initiate thus catastrophic events. Project Area falls under Zone-II which comprising the central part of Bangladesh consists of the regions of recent uplifted Pleistocene blocks of the Barind and Madhupur and the western extension of the folded belt and the Bask coefficient for this zone is 0.05g.

Devastating cyclones hit the coastal areas of Bangladesh almost every year usually accompanied by high-speed winds, sometimes reaching 250 km/hr or more causing extensive damage to life, property and livestock. Because of the funnel shaped coast, Bangladesh repeatedly becomes the landing ground of cyclones formed in the Bay of Bengal. The proposed BTL project site is far from the coastal belt, the likely impact of cyclones is relatively small.

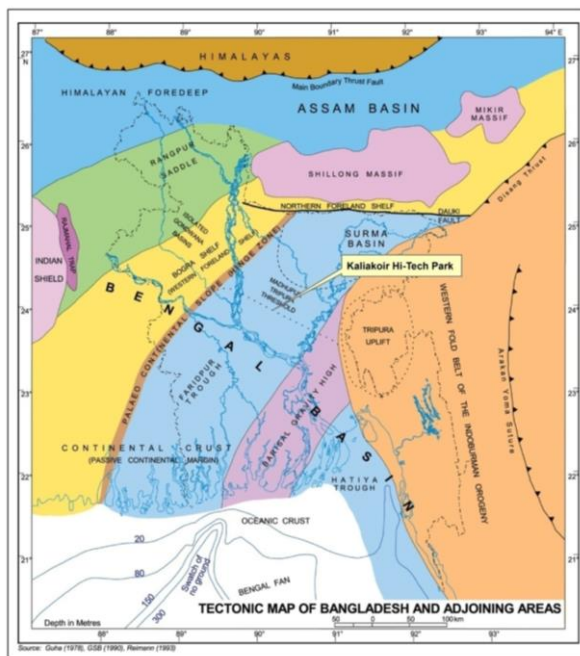


Figure-4.7-1 Generalized Tectonic Map of Project Area



Figure-4.7-2 Seismic Zone Map of the Project Area

4.8 CLIMATE

The project site is located in Dhaka Division. According to Köppen climate classification, it falls under Aw category, which is characterized by tropical wet and dry climate. Hence, it experiences hot and humid summer and dry winter. According to the climatic characteristics, Bangladesh is divided into 7 different climatic sub-regions. The study area of the project falls under category “G”, which is the south-central climatic zone of the country.

The maximum recorded temperature in Dhaka station was 39.6°C, which occurred on March, 1999 and April, 2009. On January 1995, the minimum temperature was recorded as 6.5°C in Dhaka and its surrounding areas. The warmest month of the year is April and the coldest month of the year is January. Figure 4.8-1 shows the maximum, minimum, average of maximum and average of minimum temperature of Dhaka station from 1980 to 2013.

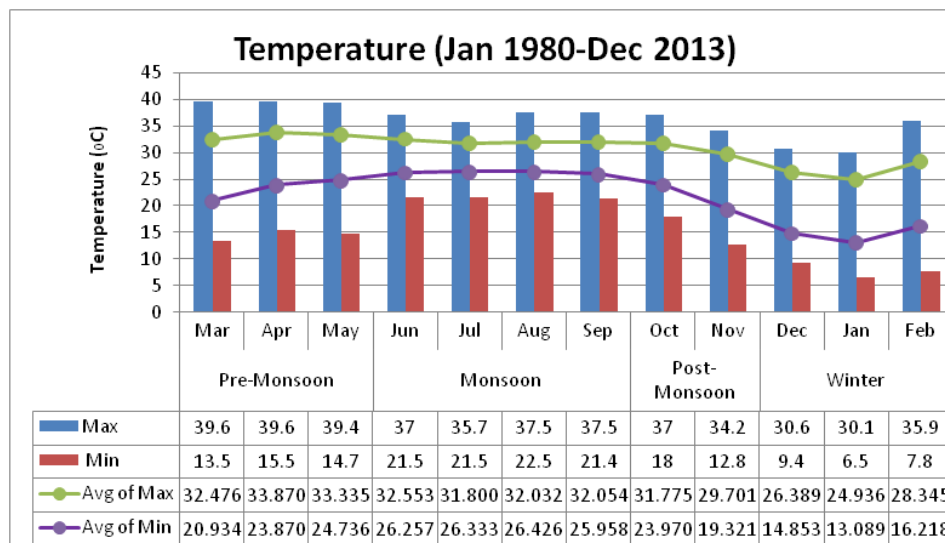


Figure-4.8-1: Monthly maximum, minimum and average temperature

The variance in the maximum rainfall during monsoon season is 836 mm/month to 552 mm/month, whereas the variance in the minimum rainfall is 136 mm/month to 59 mm/month. The maximum 836 mm/month rainfall was recorded during September of the year 2004. Annual average rainfall is 2066 mm/year and the highest recorded yearly rainfall was 3028 mm in the year 1984. The driest period of the year is winter when the average monthly rainfall varies from 21 mm/month to 7.21 mm/month.

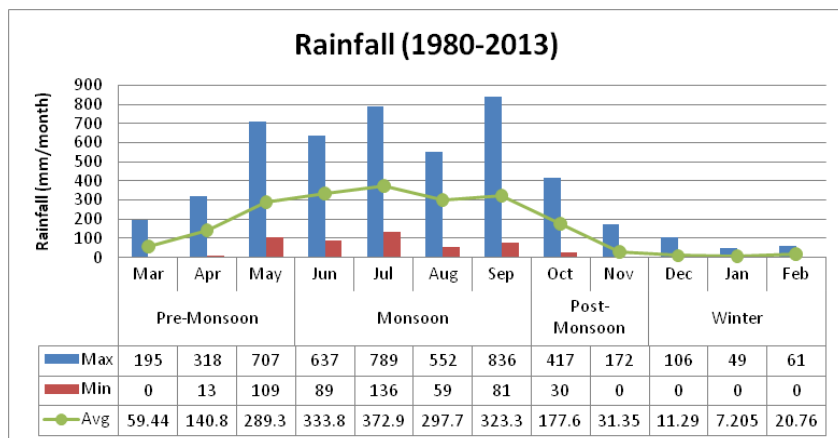


Figure 4.8-2: Monthly Maximum, Minimum and Average Rainfall

4.9 SOIL AND AGRICULTURE

The main constraint of crop production is the scarcity of irrigation water during dry season. Transplanted Aman crops are grown under rain fed condition. Delay onset of monsoon rainfall and drought in late monsoon season affect normal yield of T. Aman. Soil sampling and analysis are detailed out in Annex-I of Volume-II of the ESIA report.

In the study area, almost 80% of the cultural practices for crop production are being done manually. So, agricultural labor is considered as one of the essential inputs for crop production. The labor requirement is not uniform throughout the year. The number of labor requirement varies from crop to crop.

4.10 CURRENT PRACTICE ON ACQUIRED LAND

The proposed site is a fallow land mostly covered with climbers, herbs and shrubs. There are some trees also seen in the site. No commercial farming activity is taken place in the project area.

4.11 ECOSYSTEM AND HABITAT

Field investigation revealed that there is no ecological hot-spot within the study area. The entire study area possesses both terrestrial and aquatic ecosystem having moderate to low floral and faunal diversity.

Terrestrial Ecosystem

The major terrestrial ecosystems of the area are as follows: (i) Homestead/settlements; (ii) Crop-field; (iii) Roadside; (iv) Woodland; and (v) Sal forest.

The BHTC is out of the Sal forest. So, world bank OP related to forestry will not be triggered.

Homesteads/Settlement Ecosystem

This type of ecosystem is usually evolved by the interaction of vegetation planted by the owners for their interests and the dependent wild fauna.

- Homestead Flora

The major plant species of this ecosystem are: Tal (*Borassus flabelifer*), Kanthal (*Artocarpus heterophyllus*), Narikel (*Cocos nucifera*), Pepey (*Carica papaya*), Aam (*Mangifera indica*), Jarul (*Lagerstomia speciosa*), Rendi Koroï (*Albizia saman*), Akashmoni (*Acacia auriculiformis*), Eucalyptus (*Eucalyptus citriodora*), Bansh (*Bambusa Spp.*) etc. Besides these, there ecologically important herbs and shrubs also exist in this ecosystem.

- Homestead Fauna

The homestead vegetation plays an important role in sheltering a variety of wild animals. Among them, the major ones are: Common Toad (*Duttaphrynus melanostictus*), Cricket Frog (*Fejervarya limnocharis*), Common Tree Frog (*Polypedates maculates*) under amphibian group; House Gecko (*Hemidactylus frenatus*), Common Garden Lizard (*Calotes versicolor*), Bengal Monitor (*Varanus bengalensis*), Common Skink (*Mabuya carinata*) as reptiles; Common Myna (*Acridotheres tristis*), Asian Pied Starling (*Sturnus contra*), Red-vented Bulbul (*Pycnonotus cafer*), Oriental Magpie Robin (*Copsychus saularis*), Spotted Dove (*Streptopelia chinensis*), Blue Rock Pigeon (*Columba livia*), Coppersmith Barbet (*Megalaima haemacephala*) and Black-hooded Oriole (*Oriolus xanthornus*) under avifauna; Common Mongoose (*Herpestes edwardsii*), Small Indian Mongoose (*Herpestes auropunctatus*), Asian Palm Civet (*Paradoxurus hermaphroditus*), Common House Rat (*Rattus rattus*), Irrawaddy Squirrel (*Callosciurus pygerythrus*), Greater Short-nosed Fruit Bat (*Cynopterus sphinx*) and Indian Pipistrelle (*Pipistrellus coromandra*) as mammals.

Functionally, this ecosystem provides various goods and services, such as bamboos are inevitable elements for engraving the corpse of the villagers and also contribute in earning of the villagers. In addition, the homestead vegetation supports in meeting food, fuel, medicine and other household requirements.

Detail of the project ecological resources are described in Annex-I of the ESIA report.

4.12 DEMOGRAPHY AND COMMUNITIES

The study area is the home of 330,307 people belonging to 77,267 households. Of the total population; 173,092 (52.4%) are male and 157,215 (47.6%) female. The average household size is 4.6, which is slightly higher than the national average of 4.50 [BBS, (HIES) 2010]. The average population density is 2,511 per square kilometer which is more than double compared to national average of 1,055. The project area does not have any indigenous people.

The employment rate in the study area is 51.6 whereas the unemployment rate is 48.4. It is evident that about half of the total economically active population is still unemployed. Most of the unemployment populations are females who are solely involved in household work, and only 0.5% populations are looking for work.

The study area shows the predominance of kutchha houses (66%) compared to other three types of houses such pukka, semi-pukka and jhupri. 23% houses are semi-pukka, 10% pukka and one percent is still jhupri. Most of the pukka houses are located in municipal areas, whereas semi-pukka are predominant at the peripheral areas of municipality. Kutchha houses are predominant in the rural area.

The Kaliakair upazila has 413 Mosques, 92 temples, 7 churches as Religious institutions. Cultural organizations of this upazial are 38 Library, 132 clubs, 2cinema halls, 5 theatre groups, 6women societies. Amusement centers and Tourist spots of this upazial are Nandan Park, Shiddhimadhav Pillar, Ansar VDP Academy, Bangladesh Scouts' National Training Centre, Baliadi Zamindar Bari, Sreefaltali Zamindar Bari, Talibabad Satellite Ground Centre. So far, there is no cultural heritage this upazila.

In the study area 33% households use non-sanitary latrines, 44% use non water-sealed sanitary latrines and 19% use sanitary water-sealed latrines. However, there are 4% houses, which have no sanitation facilities but tend to use sanitary facilities on shared basis and in some cases use open spaces.

There is no social conflicts are existing in the study area without some separated incidents (political and family related).

A number of local, national and international NGOs are working in the Project area. The main activities of these NGOs are to operate micro credit programs among the rural poor and landless women/men. The major NGOs working in the area include BRAC (Bangladesh Rural Advancement Centre), ASA (Association for Social Advancement), Muslim Aid UK, CARE and Grameen Bank etc. Social Resources of the project area are detailed out in **Annex-I of Volume-II of the ESIA report.**

CHAPTER-5: ANTICIPATED ENVIRONMENTAL AND SOCIAL IMPACTS

5.1 POTENTIAL ENVIRONMENTAL IMPACT

This project will not create any severe adverse environmental impacts by its construction & operational activities. Most of the listed adverse impacts are reversible in nature and could be mitigated or removed with appropriate environmental management. Table 5.1-1, 5.1-2 & 5.1-3 shows the potential environmental impacts of the project.

Table-5.1-1 Checklist for Environmental Impacts resulting from Construction Activities

Environmental Parameters	Environmental Assessment					
	Positive Impact	No Impact	Adverse Impact			
			Low	Minor	Moderate	Major
A. Ecological						
Fisheries				S, R		
Aquatic Weeds				S, R		
Eutrophication				S, R		
Wetland				I		
Bushes/trees				I		
Animals			I			
Species Diversity		√				
Endangered Species		√				
B. Physico-chemical						
Erosion and siltation		√				
Flooding			S, R			
Drainage congestion			S, R			
Air pollution				S, R		
Noise pollution					S, R	
Solid Waste					S, R	
Water pollution				S, R		
C. Human interest related						
Loss of agricultural land			I			
Resettlement		√				
Service facilities	S					
Health and Nutrition			S, R			
Navigation		√				
Transport	S					
Employment	S					
Land ownership pattern		√				
Landscape			S, R			
Industrial Activities	S					

Note: L: Long-term and S: short-term impacts; R: reversible and I: irreversible

Table-5.1-2 Summary of Environmental Matrix for Construction Phase

Ecological Issues	Potential Impact (Consequence)	Consequence Severity Ranking	Impact Likelihood Ranking	Risk Rating
Flora	Minor impact to flora may occur. Construction of BHTC may displace or remove terrestrial/ aquatic undergrowth /floral species; Such type of undergrowth is available in the proposed project adjacent areas. As these are grows naturally and seasonality, no plantation program required; hence no major effects are expected.	Low	Possible	Low
Fauna	Minor impacts (temporary displacement) to all types of fauna. Construction of BHTC has negative impacts (e.g., habitat loss). Since the activities are temporary in nature, no major or long-term effects are anticipated, except loss of some habitat.	Low	Possible	Low
Fish	Low impact to fish community may occur; Minor impact may also occur due to deposition of excavated soil on fish habitat (e.g. existing lake), contamination of water, destruction of shallow fish habitat or saturated ground by movement of project vehicles, etc. But the impact is short term and reversible. The nearby fish communities will temporarily be impacted. The majority of impacts would be temporary in nature; fish may avoid the impacted areas during construction period, but return when it ceases.	Low	Possible	Low

Table-5.1-3 Checklist for Environmental Impacts resulting from Operational Phase of the Project

Environmental Parameters	Environmental Assessment						
	Positive Impact	No Impact	Adverse Impact				
			Low	Minor	Moderate	Major	Critical
A. Ecological							
Fisheries	L						
Aquatic Weeds		√					
Eutrophication			L				
Wetland		√					
Bushes/trees	L						
Animals		√					
Species Diversity		√					
Endangered Species		√					
B. Physico-chemical							
Erosion and siltation		√					
Flooding		√					
Drainage congestion		√					
Air pollution					S		
Noise pollution					S		
Solid Waste					S		

Environmental Parameters	Environmental Assessment						
	Positive Impact	No Impact	Adverse Impact				
			Low	Minor	Moderate	Major	Critical
E-Waste					S		
Water pollution					S		
C. Human interest related							
Loss of agricultural land		√					
Resettlement		√					
Service facilities	L						
Health and Nutrition	L						
Navigation		√					
Transport	L						
Employment	L						
Land ownership pattern	L						
Landscape	L						
Industrial Activities	L						

Note: L: Long-term and S: short-term impacts; R: reversible and I: irreversible

The environmental impact assessment above shows that there are some potential long-term impacts like solid waste and e-waste management. The BHTC authority has already built an ETP for wastewater treatment; but the collection of wastewater collection system is still not in place. For the interim period until a collection system in place, BTL will built wastewater treatment plants to manage its wastewater. BTHC Authority has committed under its sustainable environmental management program, to set up an e-waste disposal plant and to arrange for final disposal of solid waste to serve the all installations in the Hi-Tech City. The letter from the Authority is included Annex-XXI and it may be noted that BHTC is supported by another WB project Private Sector Development Support Project (PSDSP). The e-waste is a long-term issue as the manufacturing builds up. Thus, the overall environmental risk is assessed as moderate and project environment is categorized in category B (i.e., medium risk category).

5.2 IMPACT ASSESSMENT & EVALUATION

A. Construction Phase:

✓ Impact on Fauna including Fish:

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, birds and mammals from the use of vehicle or machineries over terrestrial or aquatic faunal habitats. Quantification of these losses is difficult; however, the impact is expected to be low and short-term in nature.

✓ Impact on Amphibians:

Construction activities may cause temporary or permanent disturbance of amphibian habitat. Impacts on amphibian population could be evaluated by monitoring the changes of species composition and richness and their relative abundance.

✓ **Impact on Aquatic Flora:**

Due to proposed project activities (e.g. conversion of low land to high land), some aquatic flora may have to face potential adverse impacts. People, vehicle and material movement over the aquatic floral habitat may cause damage or uproot them from the ground.

✓ **Sanitation and Solid Waste**

Problems related to sanitation and solid waste may result from improper/inappropriate facilities at the labor sheds. Lack of proper sanitation facilities for project people, including the labor/construction worker and absence of proper solid waste (e.g., food waste, construction debris) disposal facilities may create an unhealthy environment within and around the project sites.

✓ **Noise and Air Pollution**

Some noise and air pollution could result from excavation and other construction activities. Noise generated by construction activities will typically be for a short duration with minor adverse impact. During the construction phase of the proposed BTL 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.

Drainage Congestion

Since the construction phase involves significant earthwork, there are chances of stagnation and ponding of storm water if care is not taken for proper drainage of storm water.

B. Operation Phase

✓ **Noise Impact**

Prolonged exposure to 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.

Noise assessment during the operational phase of BTL is important to understand the noise level of the working environment.

✓ **Air Quality Impact:**

As there will be generator for generating power supply to the BTL, so the exhaust emission needs to be monitored.

✓ **Water Quality Impact:**

Water quality impact would be due to sewage discharge generated from residential areas, probable industrial wastewater (water used for washing may contain heavy metals, organic chemicals from industrial processing). Lake water quality should be checked periodically to make

sure that the surface water quality is guided by the national and IFC guided standard and guidelines.

✓ **Solid Waste Impact:**

The sources of solid waste at BTL shall include residential, commercial, institutional, and IT/ITES industrial activities. All nonhazardous solid waste from a community that requires collection and transport to a processing or disposal site is called refuse or municipal solid waste (MSW).

✓ **Beneficial Impacts, Employment and Commercial Activities**

Overall, it can be concluded that *no environmental component will be significantly affected negatively as a result of the project activities*. Socioeconomic environment can be considered to be affected positively as the project activities will create new job opportunities for the local people and local commerce and business will get a big boost from the project. All these impacts are likely to contribute to improve the quality of life of the local community, in addition to contributing to national economic growth by initiating “knowledge intensive” industrialization.

BTHC is a long-term project, which may take a decade or more to be fully operational. As leaseholders set up more and industries, in the BTL block and the other blocks in BTHC, all the activities will give rise to individual impacts. These impacts, although small from individual units, these can add up to Cumulative Impacts that may be significant. There are a few cumulative impacts expected in the proposed BHTC project affecting available resources or receptors. The growth of other industries impact zone considered here, may also add to the Cumulative Impact. As the course of development in the BHTC is still uncertain, a prudential monitoring plan has to be in place, so that emerging issues can be identified and addressed. The e-waste issue calls for especial attention and this is like to emerge as significant in near term (probably 5 years). The planned e-waste management plan of BHTC should be timely constructed to manage the e-waste problem in the BTL block and also others.

A simple semi-quantitative descriptive checklist method has been applied to evaluate the potential environmental impacts. Firstly, the activities during construction and operation were identified and listed in the impact table. Then the corresponding impacts on the specific ecological components (terrestrial and aquatic flora and fauna, fish), socio-economic parameters and physico-chemical environment attributes were evaluated based on the baseline scenario and an assessment of the typical interactions with BTL project activities. Annex-II has described the impact evaluation of the project.

This chapter summarized the anticipated environmental and social impacts of the project area. The details are annexed in Annex-II of ESIA Report: Volume-II.

CHAPTER-6: ANALYSIS OF ALTERNATIVES

6.1 GENERAL

The purpose of the analysis of alternatives as part of the ESIA process is to select the best among all possible project options. The assessments and recommendations made by the EISA team are presented below.

6.2 SITE SELECTION

The critical and attentive issues for selection of Hi-Tech Park site are listed below:

- Avoiding the following twelve (12) Ecologically Critical Areas: Human Settlements, Forest Sanctuaries, National Parks, Game Reserves, Mangroves, Forest Areas, Wetlands, Wildlife Habitats, Archaeological Sites, Ancient Monument Sites, Biodiversity Areas and Similar Other Areas.
- Preference of Non-productive Land: The non-productive land as an alternative just near the proposed agriculture land is preferable for environmental soundness.

The Hi-Tech Park land is a Government owned land and has no dispute with the locality. More on the land is out of the DOE identified twelve ecologically critically areas.

The site is well located considering the following:

- Easy access
- Close proximity to organized industrial zone
- Close proximity to the already existing national electric transmission lines
- Close proximity to the already existing natural gas transmission lines

6.3 NO PROJECT SCENARIO

Since independence, Bangladesh has been striving to develop its agricultural resources and primary industries in an effort to bring welfare to its vast population of about 160 million. In order to further hasten the development process, Bangladesh had to encourage manufacturing activities parallel to agricultural development. Greater emphasis was placed on ready-made garment industries and subsequently Export Processing Zones (EPZ) were established at different parts of the country to accelerate employment generation, export of manufactured goods and thus earn foreign exchange for the country.

In line with world trends, Bangladesh has also recognized that new directions have to be set for the future prosperity of the country. Information technology has been identified as a "thrust sector" for Bangladesh economy. Plans have been prepared to enable Bangladesh to embrace the information age and to become an important player in the global market in information and other high technology sectors. Accordingly, the GoB decided to develop a Hi-Tech Park at Kaliakoir, about 40 km from Dhaka City and 25 km from the Zia International Airport in Dhaka. The proposed Hi-Tech Park at Kaliakoir is envisaged as an integrated, ultra-modern techno-township

that would be designed to attract some of the large transnational companies and to serve the world class business enterprises. This may be considered as one of the most important steps to the proposed transformation of Bangladesh from agro/industrial economy to knowledge-based industrial/services economy. This will make significant contributions to local, regional and national economic development through job creation/retention and as regional gateways for generating value adding economic activities. . It may be noteworthy that even the total employment in the ICT industry has kept pace with overall economic growth, with present levels of employment in the ICT industry estimated at nearly 25,000 employees. The no-project scenarios will oversight various benefits like employment generation, industrial growth and revenue etc. which would not be obtained without the project.

CHAPTER-7: INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

7.1 FOCUS GROUP DISCUSSION (FGD)

One focus group discussion was held in the Bakhtarpur village on 26th April 2019. The overall outputs from the FGD are given below.

- This project will help the nation in contribution of national economic growth by initiating the “knowledge intensive” industrialization;
- Maiaboti, Nim, Gaejon, Chamkathal etc. should be planted in the hi-tech park area. These plants will stay around 200 years to protect the environment of the project area;
- Local peoples have acknowledged the project activities of the BTL;
- Safety of the Construction work should be improved so that the nearby residences are not affected;
- Job opportunity should be created for the local people so that they can get job in the Construction and Operation phases;
- This project will open job opportunity for the jobless young people of the country.

Table-7.1-1 Participant list of the FGD

Sl. No.	Name of the Participants	Profession	Contact Information
1.	Mohammad Abdul Amir	Farmer	Bakhtarpur Village
2.	Mr. Saizuddin Sikder	Farmer	Ditto
3.	Mohammad Sohel rana	Small Shopkeeper	+8801713579382
4.	Mohammad Alamgir	Day laborer	Bakhtarpur Village
5.	Ram Chandra Shill	Barber	+8801935199485
6.	Mohammad Hasan	Garments Worker	+8801775407664
7.	Mr. Suman	Student	Bakhtarpur High School
8.	Mohammad Abdul Matin	Auto Rickshaw Driver	+8801835541064
9.	Mr. Zakir Hossain	Staff Bus Driver of Apex Group	+8801825906687

The photographs and participants list is annexed in Annex-XV of ESIA Report: Volume-II.

7.2 PUBLIC DISCLOSURE

The draft I ESIA report was disclosed in the BTL website (<https://technosity.net/>) for public comments on 26-05-2019. The final ESIA will be made available at accessible places (e.g. local government offices, libraries, community centers, etc.), and a summary translated into local language (Bengali) in the BTL and Bangladesh Bank websites. The final ESIA document will be shared with WB for clearance and disclosure according to its procedure. As a part of the disclosure, all versions (Bengali and English) will be available at the project office in addition to BTL’s website. The details are annexed in Annex-III of ESIA Report: Volume-II.

CHAPTER-8: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) AND COMMITMENT PLAN (ESCP)

8.1 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

ESMP of this project clearly layout:

- 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) monitoring plan to assess the effectiveness of the mitigation measures employed.

Environmental management and monitoring activities for the BTL project could be divided into management and monitoring:

- i. during construction phase, and
- ii. during operation phase

8.2 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 head of BTL project for this specific project should take the overall responsibility of environmental management and monitoring. The head of project will form a team with required manpower and expertise to ensure proper environmental monitoring, as specified in the following sub-section, and to take appropriate measures to mitigate any adverse impact and to enhance beneficial impacts, resulting from the project activities. For this purpose, he will engage an environmental and social specialist in the Environmental Management Unit (EMU) who will assist him these activities. The head of the project 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 head of the project to ensure proper environmental management of the project activities. Figure-8.2-1 shows the ESMP organogram for the construction period of the BTL project. It should be emphasized that local communities should be involved in the management of activities that have potential impacts on them (e.g., traffic congestion in the surrounding areas). They should be properly consulted before taking any management decision that may affect them. Environmental management is likely to be most successful if such decisions are taken in consultation with the local community. The environmental management during the construction phase should primarily be focused on addressing the possible negative impacts arising from:

- (a) Cutting/ clearing of trees/ vegetation in the project site for preparation of land for construction
- (b) Air pollution
- (c) Traffic/communication problems
- (d) Noise pollution
- (e) Drainage congestion
- (f) Water and soil pollution
- (g) Employment of labor force giving priority to local people

The environmental management should also focus on enhancing the possible beneficial impacts arising from employment of local workforce for construction works. In addition, the PMU should set up a procedure to address complaints and grievances (e.g., receiving formal complaints/ grievances, arrange hearing involving all stakeholders and keeping records of such hearings, device and implement mitigation measures). However, the complaints and grievances redress procedure will not preempt aggrieved person's/ group's right to seek redress in the courts of law. The monitoring plan and monitoring schedule has been presented in the subsequent sections.

Operation Phase:

Most of the environmental parameters will experience beneficial effects during the operation phase of the BTL project. Efforts should be made to enhance these beneficial impacts, which may include incentives for proper growth of industries in the area. Environmental Management Unit (EMU) of the BTL project team will conduct the overall environmental management during operation phase of the project. Organogram of the ESMP of the BTL is shown in Figure 8.2-1. The issues which should be considered with utmost priority during operation phase of environmental management are: (a) Air pollution (b) Management of solid and hazardous waste (c) Noise pollution (d) Traffic congestion (e) Health care facility (f) Employment opportunity (g) Safety issues related to fire (h) Impact to Water resources.

In addition, the procedure to address complaints and grievances (noted above) should also be in place during operational phase. Table 8.2-1 summarizes the potentially significant environmental impacts during operation phase, the measures needed to eliminate or offset adverse impacts and enhance positive impacts. The monitoring plan and monitoring schedule has been presented in subsequent sections. Most of the mitigation and enhancement measures identified for operation phase. Table 8.2-1 will have to be addressed during the design phase and resources required will be within the estimated cost of the park construction.

Implementation Schedule:

An implementation schedule for environmental management and monitoring during the construction phase will be prepared by the Contractor as part of construction contract following recommended mitigation measures of potentially significant impacts. During the operation phase the EMU will prepare the monitoring reports. Table 8.2-1 shows a tentative plan for

environmental reporting. These reports should be shared with IPFF and the World Bank from time to time. The line of communication and reporting is described in Figure-8.2-1.

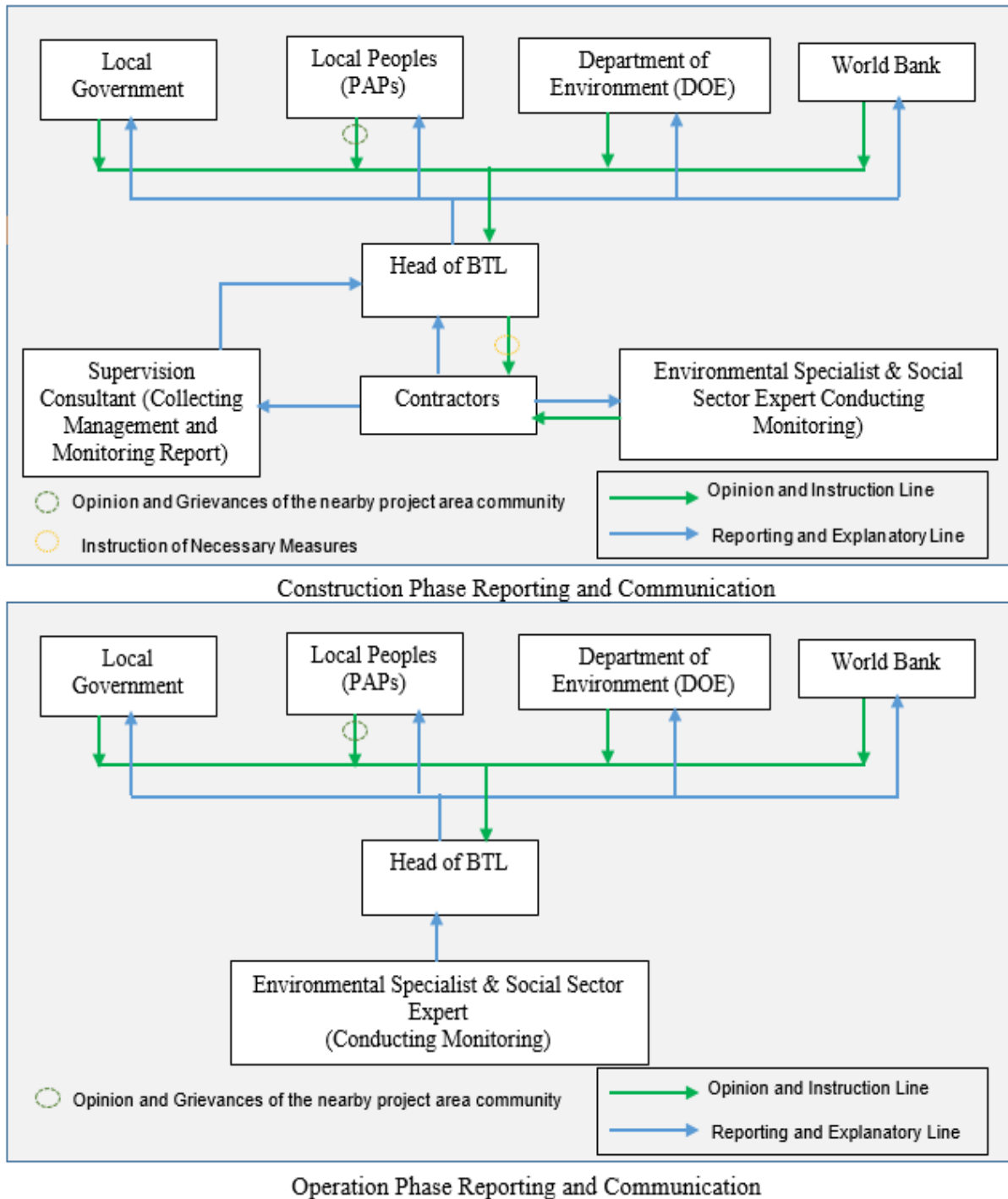


Figure-8.2-1 Line of communication and reporting

Table 8.2-1 Environmental monitoring reporting schedule

Stage/Topic	Frequency/Stage	Contributors
Initial review	Before start of work	BTL, Consultant
Routine Progress Report	Quarterly	Environmental and Social Sector Expert
Specific Problems and Solutions	As required	Environmental and Social Sector Expert
Mid-term Review: - review of activities - possible modification to procedure and/or overall plan	Approximate mid-way through the project	Consultant
Final Review	Toward the end of the project	BTL, Consultant, Contractor
Yearly Environmental Management Report for World Bank	Every Year	BTL

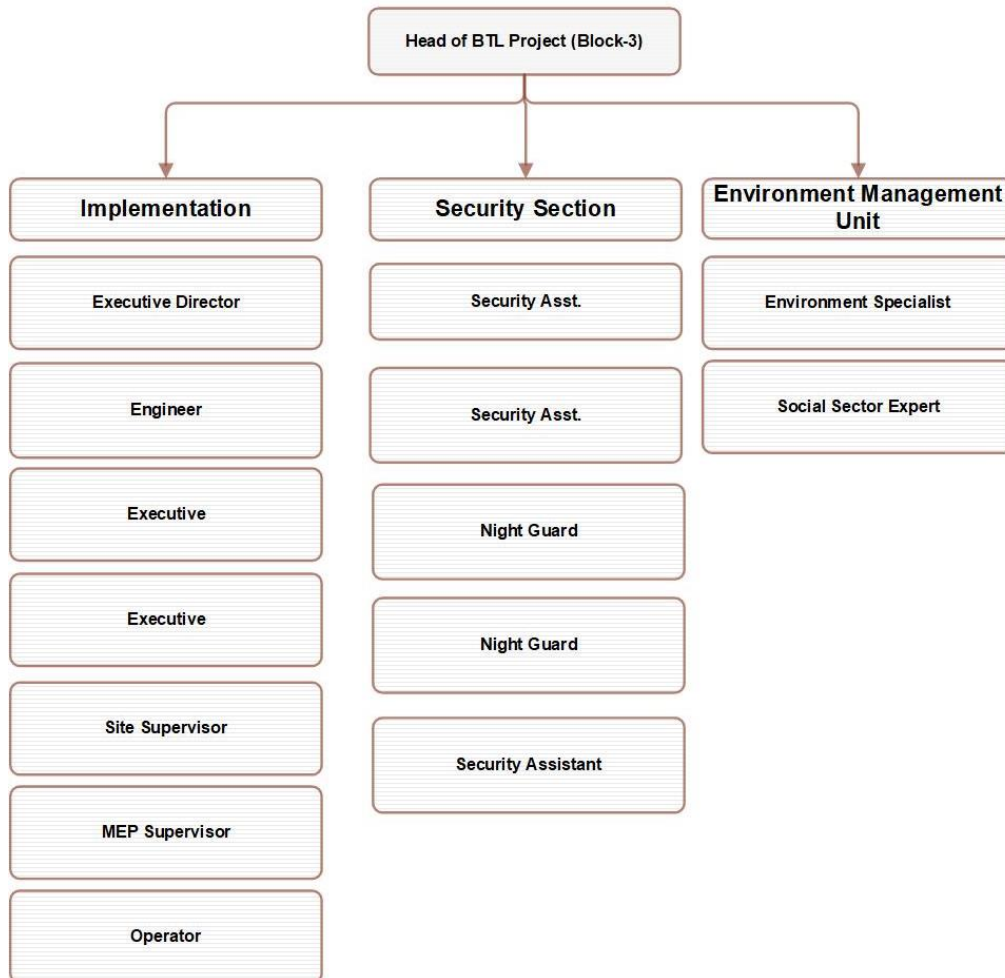


Figure-8.2-1 Project Team Organogram for Constructin and Operation Phases

8.3 ENVIRONMENTAL MONITORING DURING CONSTRUCTION PHASE

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. This section outlines the main environmental parameters to be monitored, timing of the monitoring work and the recommended frequency of monitoring during the construction phase of the project. Specific monitoring requirements for the environmental issues during construction phase listed in Table 8.3-1 are presented in Table 8.3-2.

Table 8.3-1 Monitoring issues/ requirements during Construction phase of the project

Environmental Issue	Monitoring requirements/issues
Air pollution	<ul style="list-style-type: none"> - Construction materials should be properly covered while hauled and stored, roads properly cleaned and water sprayed in order to minimize concentration of dust in air. - Use of equipment like stone crushers (for concreting work), which produce excessive noise as well as generate particulate matter, must not be used close to human settlement. - During trench construction activities, the topsoil removed should be placed in a location that ensures little or no fugitive dust formation from stockpile. - Concentration of particulate matter within and around the project site should be measured, at least once every three months, and air quality management plan should be revised, if needed.
Noise pollution	<ul style="list-style-type: none"> - Equipment producing excessive noise should not be operated after dark. - Use of equipment like stone crushers (for concreting work), which produce excessive noise as well as particulate matter, must not be used at the site. - Vehicle movement to and from the site should be properly managed in order to ensure that this causes minimum disturbance to the people living in the surrounding areas. - Noise levels along the perimeters of the project area should be monitored during the construction period and any defective equipment or vehicle removed from activities immediately.
Traffic congestion	<ul style="list-style-type: none"> - Hauling of materials and equipment to and from project sites should preferably be done after the regular working hours, so that it causes minimum disturbances to the regular traffic in and around the project site. - Contractor should take responsibility of proper traffic flow and management within the immediate vicinity of the project site.
Drainage congestion	<ul style="list-style-type: none"> - Appropriate measures should be taken to avoid temporary drainage congestion during construction activities
Impacts to Water Resources	<ul style="list-style-type: none"> - During excavation activities, the topsoil removed should be placed in a location that ensures no turbidity impacts to nearby water resources. - Should the contractor vacate the area leaving stockpiled material a suitable penalty (fine and removal cost) should be levied to remedy the situation. - Wastewater from workers' camp should be well managed.

Table 8.3-2 shows monitoring plan during construction phase of the project. The monitoring plan includes the parameters to be monitored, the time location and frequency of monitoring and the assignment of responsibilities. As can be seen from Table 8.3-2, monitoring is primarily the

responsibility of the Contractor. The Contractor will perform these monitoring activities as prescribed in Table 8.3-1 and will directly report the results to the head of the project. The project head will examine the performance of the contractor in carrying out these activities.

Table 8.3-2 Monitoring parameters and frequency during construction phase

Monitoring	Period/Location	Parameters to be monitored	Monitoring Frequency and responsibilities	Resources Required
Noise Level	<u>Baseline</u> One set of measurements at property boundaries of selected critical locations (the nearby residential plot, other residential areas, highways etc.) prior to commencing activities. One set of measurements at the same locations during construction activities	Equivalent Noise level (L_{eq}) with GPS location, wind speed and direction	Spot checking in a monthly basis; Contractor's Responsibility	Noise level meter, GPS;
Air Quality (dust particles/particulate matter)	<u>Baseline</u> Only at selected critical locations downwind of site activities (prior to commencement of work) and in close proximity to human receptors (specially the nearby residential plot). Only at selected critical locations downwind of site activities (during construction activities) and in close proximity to human receptors	PM ₁₀ , PM _{2.5} with GPS location, wind speed and direction	Once in three months or as deemed by the Project Coordinator; Contractor's Responsibility	PM sampling device*, GPS Wind speed/direction data to be collected from local BMD station
Surface Water Quality	<u>Baseline:</u> One measurement from a location of the project site of BHTC lake and the downstream of the Bangshi river. One measurement from the same location during construction activities.	Turbidity, Total Suspended Solids, Dissolved Oxygen, oil and grease, BOD, COD	Monthly and as directed by the Project team leader; Contractor's Responsibility	Laboratory facilities for water/wastewater analysis
Ground water quality	Chemical Analysis of Tube-well water used as drinking water source for the workers	Routine drinking water parameters	Once in six months; Contractor's Responsibility	Laboratory facilities for water/wastewater analysis
Soil Quality	Sample randomly selected at one or two locations within the project site	Selected heavy metals (Pb, Cr, Cd)	Once in six months; Contractor's Responsibility	Laboratory facilities for soil sample analysis

Monitoring	Period/Location	Parameters to be monitored	Monitoring Frequency and responsibilities	Resources Required
General site condition	<u>Baseline:</u> Visual survey (once) of proposed site before commencement of work. Visual survey of the project site during the entire period of construction	General site condition, traffic condition, pedestrian movement, vegetation clearance etc. by visual survey (photographs)	Weekly and as directed by the Project team leader; Contractor's Responsibility	Digital camera
House-keeping activities, Safety measures during construction	Visual survey of the project site during the entire period of construction	Construction debris management, road traffic/ river traffic management, management of flammable materials (if any), use of Personal Protective Equipment by workers etc.	Weekly and as directed by the Project team leader; Contractor's Responsibility	Digital camera

Note: *PM-sampling has to be done with USEPA-approved FRM-based or equivalent PM sampling device. The Project Coordinator will decide actual monitoring time and location.

The measured noise levels should conform to the national noise level standards as well as the IFC guidelines 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 as well as those mentioned in the IFC guidelines for particulate matters in the air. The surface water quality parameters measured should be within the limits of Bangladesh Standards for inland water quality. The drinking water quality parameters should be within Bangladesh drinking water quality standards.

8.4 ENVIRONMENTAL MONITORING DURING OPERATION PHASE

Environmental monitoring during operation phase must address the concerns of air and noise pollution as well as solid/liquid waste generated from the Hi-Tech park facility. This would be mainly the responsibility of BTL. Specific monitoring requirements for the environmental issues during operation phase listed in Table 8.4-1 are presented in Table 8.4-2.

Table 8.4-1: Monitoring issues/requirements during Operation phase of the project

Environmental Issue	Monitoring requirements/issues
Air pollution	- Ambient air quality should be monitored at different locations around the BHTC site within a 5-km radius
Noise pollution	- Indoor noise environment should also be assessed as a part of the occupational health and safety plan
Traffic congestion	- Hauling of materials and equipment to and from project sites should preferably be done after the regular working hours, so that it causes minimum disturbances to the regular traffic in and around the project site. - Contractor should take responsibility of proper traffic flow and management within the immediate vicinity of the project site.

Environmental Issue	Monitoring requirements/issues
Impacts to Water Resources	<ul style="list-style-type: none"> - Lake water quality i.e. Dissolved Oxygen, oil and grease etc. should be monitored. - The groundwater level along with the selected drinking water quality parameters (e.g., pH, Color, Turbidity, TDS, Ammonia, Nitrate, Phosphate, As, Fe, Mn and Coliforms) may be monitored since the groundwater would still be used for drinking purpose for the BTL officials.
Management of Solid Waste	<ul style="list-style-type: none"> - Amount of solid waste generated from the facility should be documented - The hazardous nature of the waste should be assessed before final disposal at a landfill

Table 8.4-2 Monitoring parameters and frequency during Operation Phase

Monitoring	Period/Location	Parameters to be monitored	Monitoring Frequency and responsibilities	Resources Required
Noise Level	<u>Baseline</u> One set of measurements at property boundaries of selected critical locations (the nearby residential plot, other residential areas, highways etc.) prior to commencing activities.	Equivalent Noise level (L_{eq}) with GPS location, wind speed and direction	Spot checking in a monthly basis; BTL's Responsibility	Noise level meter, GPS;
Ambient Air Quality (particulate matter)	<u>Baseline</u> At the BHTC gate.	SPM, PM ₁₀ , PM _{2.5} , SO _x , NO _x , CO, VOC with GPS location, wind speed and direction	Once in three months or as deemed by the EMU; BTL's Responsibility	PM sampling device*, GPS Wind speed/direction data to be collected from local BMD station. **CAMS is required to monitor the continuous air quality.
Surface Water Quality	<u>Baseline:</u> One measurement from a location of the project site of BHTC lake.	Turbidity, Total Suspended Solids, Dissolved Oxygen, oil and grease, BOD, COD	Quarterly and as directed by the EMU; BTL's Responsibility	Laboratory facilities for water/wastewater analysis
Ground water quality	Chemical Analysis of Tube-well water used as drinking water source for the officials	Routine drinking water parameters	Quarterly and as directed by the EMU; BTL's Responsibility	Laboratory facilities for water/wastewater analysis
Soil Quality	Sample randomly selected at one location within the BHTC site.	Selected heavy metals (Pb, Cr, Cd)	Once in a year; as directed by the EMU; BTL's Responsibility	Laboratory facilities for soil sample analysis
Management of Solid Waste	Visual survey of the BHTC Complex during operation.	Solid Waste Management of the BHTC	Weekly and as directed by the EMU; BTL's Responsibility in	Digital camera

Monitoring	Period/Location	Parameters to be monitored	Monitoring Frequency and responsibilities	Resources Required
			collaboration with Kalikoir Hi-Tech Park	
Management of Waste Water Treatment Plant	Visual survey of the BTL	BOD, COD, TSS, TKN, Ammonia Nitrogen, Total Phosphorous and Oil and Grease	Twice in a year	Laboratory facilities for water/wastewater analysis
Management of Sewage Treatment Plant	Visual survey of the BTL	Sewage Management of the BHTC	Once in a Year	Kaliakoir Pourashava Support would be required
Safety measures during Operation	Visual survey of the BTL Complex during operation.	Road traffic management, management of flammable materials (if any), use of Personal Protective Equipment by BTL officials etc.	Weekly and as directed by the EMU; BTL's Responsibility	Digital camera

Note: * PM-sampling has to be done with USEPA-approved FRM-based or equivalent PM sampling device. The Project Coordinator will decide actual monitoring time and location. Actual monitoring time and location will be decided by the proposed Environmental Management Unit (EMU). During the operation phase, the monitoring may be carried out by the EMU through its own staff and equipment, if available, or can be out-sourced to a competent Contractor. ** Continuous monitoring if a CAMS is established.

8.5 ESTIMATION OF COST OF EMP

Many of the activities to be carried out as a part of EMP would not involve any additional direct cost e.g., employing local work force, where appropriate; keeping subproject vehicles in good operating condition; scheduling deliveries of materials/ goods in off-peak hours; good housekeeping, avoiding spills; etc. Medical examination can be performed by in-house medical doctors. On the other hand, a number of activities would require additional cost. Environmental monitoring during construction phase would involve direct cost. At the same time, a number mitigation measures (including health and safety measures) would require additional cost; these include medical examination, water sprinkling on surfaces, protective gear etc. Table 8.5-1 provides method of estimation of costs of different items of EMP. It is advised that the BTL authorities develop in-house capacity of monitoring some of these environmental parameters such as laboratory facilities for analyzing water/wastewater samples etc.

Table 8.5-1 Method/basis of estimation of cost of Monitoring

Monitoring Item	Basis of Cost/Estimated Cost
Noise level	Prevailing rate (~Tk. 5,000/- per measurement per day)
Ambient Air Quality	Prevailing rate (~ Tk. 40,000/- per measurement)
CAMS (Meteorological instrumentation with continuous data recorder)	3,000,000/-*
Routine Drinking water quality parameters	Prevailing rate (~Tk. 8,500/- per sample)
Surface Water quality (Turbidity, Total Suspended Solids, Total Solids, Dissolved Oxygen, Oil and grease, BOD, COD)	Prevailing rate (~Tk. 8,000/- per sample)

Monitoring Item	Basis of Cost/Estimated Cost
Waste Water Quality (BOD, COD, TSS, TKN, Ammonia Nitrogen, Total Phosphorous and Oil and Grease)	Prevailing rate (~Tk. 30,000/- per sample)
Soil Quality (Heavy metals Pb, Cr, Cd)	Prevailing rate (~Tk. 6,000/- per sample)
Water sprinkling on aggregate	Latest PWD/LGED rate (if available)/ A fixed rate per cubic meter of aggregate per day
Protective gear	Contractor to quote rate of different items of works considering the provision of adequate protective gear for workers, in accordance to the conditions of contract, specified in the Tender Document

*Meteorological Instrument with data recorder will be purchased in the 1st year of operation.

Yearly Budget for the Construction & operation phases of the project would be:

Yearly Environmental management budget during the Construction phase	= 800,000.00BDT
Yearly Operational budget for Environmental management	= 600,000.00BDT

This chapter summarizes the ESMP of the project. The details are annexed in Annex-IV of ESIA Report: Volume-II.

8.6 ENVIRONMENTAL AND SOCIAL COMMITMENT PLAN (ESCP)

Bangladesh Technosity Limited (BTL) is planning to implement the Bangabandhu Hi-tech City Project (the Project), with the involvement of the Ministry of Science and Information Technology (MoSICT). The World Bank has agreed to provide financing, implementation support and monitoring for the Project.

Bangladesh Technosity Limited (BTL) will implement measures and actions so that the Project is implemented in accordance with the World Bank Environmental and Social Standards (ESSs). This Environmental and Social Commitment Plan (ESCP) sets out a summary of the material measures and actions.

Where the ESCP refers to specific plans, whether they have already been prepared or are to be developed, the ESCP requires compliance with all mandatory provisions of such plans. In particular, the ESCP requires compliance with the mandatory measures and actions set out in ESIA that has been developed for the Project.

The table below summarizes the material measures and actions that are required, the basis of the requirement, the timing of the measure or action, and the criteria to be used for determining whether the required measure or action has been successfully achieved. BTL is responsible for compliance with all requirements of the ESCP even when implementation of specific measures and actions is conducted by the Ministry, agency or unit referenced in 1. above.

Implementation of the material measures and actions set out in this ESCP will be monitored and reported to the World Bank by BTL as required by the ESCP and the conditions of the legal agreement, and the World Bank will monitor and assess progress and completion of the measures and actions throughout implementation of the Project.

Where the material measures and actions set out in the ESCP involve the preparation of assessments, management tools, instruments, procedures, plans and other relevant documentation or actions, World Bank approval is needed before those measures and actions are considered complete, unless otherwise specified in the ESCP.

As agreed by the Bank and BTL, this ESCP may be revised from time to time during Project implementation, to reflect adaptive management of Project changes and unforeseen circumstances or in response to assessment of Project performance conducted under the ESCP itself. In such circumstances, BTL will promptly propose and agree changes with the Bank and will update the ESCP to reflect such changes. Agreement on changes to the ESCP will be documented through the exchange of letters signed between the World Bank and the BTL. The BTL will promptly disclose the updated ESCP.

Where risks and impacts arise during Project implementation, the BTL shall provide additional funds to implement actions and measures to address such risks and impacts, which may include risks and impacts that are relevant to the Project, such as, environmental, health, and safety impacts, labor influx, gender-based violence etc.

A. ESCP Monitoring and Reporting

<i>Summary of the Material Measures and Actions to Mitigate the Project's Potential Environmental and Social Risks and Impacts</i>		<i>Timeframe/ Completion Date</i>	<i>Responsibility / Authority</i>	<i>Deliverables/ Indicator of Completion</i>
1	<u>Regular reporting:</u> Prepare and submit regular monitoring reports (<i>regular reports</i>) on the implementation of the ECSP.	Indicate frequency of reporting, e.g. six monthly throughout Project implementation.	EMU of BTL	Regular reports submitted in form and substance acceptable to the Bank, providing details of: (i) status of implementation of the ESCP; (ii) conditions, if any, which interfere or threaten to interfere with the implementation of the ESCP; and (iii) corrective and preventive measures taken or required to be taken to address such conditions.
2	<u>Incidents and accidents notification:</u> Promptly notify any incident or accident related or having an impact on the Project which has, or is likely to have, a significant adverse effect on the environment, the affected communities, the public or workers.	Promptly after taking notice of the incident or accident.	Ditto	The notification provides sufficient detail regarding the incident or accident and indicates immediate measures taken to address them, and includes information provided by the contractor(s) and supervising entity(ies).
3	<u>Subsequent reporting on incidents and accidents:</u> Provide separate reports on the incidents and accidents at the request of the Bank.	Promptly upon Bank's request.	Ditto	Separate reports provided to the Bank regarding the on-going management of incidents and accidents previously notified in form and substance acceptable to the Bank.
SUMMARY ASSESSMENT				

B. ESS in the Project Works

<i>Summary of the Material Measures and Actions to Mitigate the Project's Potential Environmental and Social Risks and Impacts</i>		<i>Timeframe/ Completion Date</i>	<i>Responsibility/ Authority</i>	<i>Deliverables/ Indicator of Completion</i>
ESS 1: ASSESSMENT AND MANAGEMENT OF ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS				
1.1	<u>Organizational structure:</u> Establish and maintain an organizational structure with adequate policies, procedures, resources and qualified staff to support management of E&S risks. Development of Environmental Management Unit (EMU) for this project.	Construction and Operation phases	BTL & Contractor	Organizational structure established and maintained. Regular reports provides details on the organizational structure.
1.2	<u>Environmental and social assessment:</u> Carry out an environmental and social assessment to assess the environmental and social risks and impacts of the Project.	Before the Project Start	BTL	ESA prepared and disclosed in accordance with the Stakeholder Engagement Plan (SEP). The ESA takes into account the General Environmental, Health and Safety Guidelines (EHSG), and all relevant E&S risks of the Project.
1.3	<u>Management tools and instruments:</u> Develop and implement Environmental and Social Management Plan (ESMP).	Ditto	BTL	The ESMP prepared and disclosed in accordance with the SEP. Regular reports provide details on the implementation.

<i>Summary of the Material Measures and Actions to Mitigate the Project's Potential Environmental and Social Risks and Impacts</i>		<i>Timeframe/ Completion Date</i>	<i>Responsibility/ Authority</i>	<i>Deliverables/ Indicator of Completion</i>
1.4	<u>Management of contractors:</u> Develop and implement procedures for managing contractors and subcontractors.	Prior to the preparation of procurement documents. Maintain procedures throughout Project implementation in the Construction Phase.	BTL	Procedures developed and implemented include, as appropriate: <ul style="list-style-type: none"> • How relevant requirements are included in contracts and subcontracts (reflecting ESSs and ESCP); • codes of conduct; • coordination; • reporting and oversight, including requirement of promptly notifying incidents and accidents; • grievance mechanisms. Regular reports provide details on contractor oversight and contractor environmental, social, health and safety (ESHS) performance.
1.5	<u>Permit, consents and authorizations:</u> Obtain or assist in obtaining, as appropriate, the permits, consents and authorizations that are applicable to the Project from relevant national authorities, and comply or cause to comply, as appropriate, with the conditions established in these permits, consents and authorizations throughout Project implementation.	During the Construction and Operation Phases. Every year from the DOE for the ECC renewal.	BTL	Required permits, consents and authorization obtained. Regular reports provide details of compliance with applicable permits, consents and authorizations.
1.6	<u>Third Party Monitoring:</u>	Maintained throughout Project implementation.	Supervision Consultant	Third party selected in accordance with terms of reference acceptable to the Bank. Regular reports include reports prepared by third party monitor(s).

<i>Summary of the Material Measures and Actions to Mitigate the Project's Potential Environmental and Social Risks and Impacts</i>		<i>Timeframe/ Completion Date</i>	<i>Responsibility/ Authority</i>	<i>Deliverables/ Indicator of Completion</i>
ESS 2: LABOR AND WORKING CONDITIONS				
2.1	<u>Labor management procedures:</u> Develop and implement labor management procedures.	Prior to engaging project workers and maintained through Project implementation.	BTL	The labor management procedures are prepared and disclosed in accordance with the SEP. Regular reports provide details on its adoption and implementation, including status of contractor/subcontractor labor management policies. Annex-XXII describes the details of the Labor Management Procedures of this project.
2.2	<u>Grievance mechanism for Project workers:</u> Develop and maintain a grievance mechanism for Project workers.	Grievance mechanism operational prior to e.g. engaging project workers and maintained throughout Project implementation.	BTL & Contractor	Grievance mechanism for project workers established and maintained. Regular reports provide details on its functioning, including information of claims submitted to it and resolutions.
2.3	<u>OHS measures:</u> Develop and implement occupational, health and safety (OHS) plan.	Prior to initiating construction. Maintained throughout Project implementation.	BTL & Contractor	OHS plan prepared includes appropriate measures as required in ESS2 and applicable EHSGs. Regular reports provide details on OHS plan implementation, including incident and enforcement statistics, status of training, etc.
ESS 3: RESOURCE EFFICIENCY AND POLLUTION PREVENTION AND MANAGEMENT				
3.1	<u>Management of wastes and hazardous materials:</u> Develop and implement a procedure or plan to manage waste and hazardous materials.	Prior to initiating construction. Maintained throughout Project implementation.	BTL & Contractor	Plan prepared and disclosed in accordance with the SEP. Regular reports provide details on plan on status of plan development, training, and implementation.

	<i>Summary of the Material Measures and Actions to Mitigate the Project's Potential Environmental and Social Risks and Impacts</i>	<i>Timeframe/ Completion Date</i>	<i>Responsibility/ Authority</i>	<i>Deliverables/ Indicator of Completion</i>
ESS 4: COMMUNITY HEALTH AND SAFETY				
4.1	<u>Community health and safety training:</u> Implement training of Project workers designed to heighten awareness of risks and to mitigate impacts on local communities.	Prior to initiating construction, with regular refresher training.	BTL & Contractor	Regular reporting provides details on trainings.
4.2	<u>Traffic and road safety:</u> Develop and implement a procedure or plan to address traffic and road safety risks.	Prior to initiating construction. Maintained throughout Project implementation.	BTL & Contractor	The plan prepared includes e.g. undertake a road safety assessment for each phase of the project. monitor incidents and accidents and regularly report. Regular reporting provides details on plan implementation.
4.3	<u>Community health and safety plan:</u> Develop a procedure or plan to address specific risks and impacts to the community arising from Project activities.	Prior to initiating construction. Maintained throughout Project implementation.	BTL & Contractor	The plan or procedure includes identify the type or risks and impacts, e.g. housing, health issues, ecosystem services, labor influx. Regular reports provide details on plan implementation.

<i>Summary of the Material Measures and Actions to Mitigate the Project's Potential Environmental and Social Risks and Impacts</i>		<i>Timeframe/ Completion Date</i>	<i>Responsibility/ Authority</i>	<i>Deliverables/ Indicator of Completion</i>
4.4	<u>GBV and SEA risks</u> : Develop and implement a plan to address risks of gender-based violence (GBV) and sexual exploitation and abuse (SEA).	Prior to initiating construction. Maintained throughout Project implementation.	BTL & Contractor	The plan prepared considers incident notification requirements under the ESCP and is disclosed in accordance with the SEP. Regular reports provide details on plan implementation.
4.6	<u>Emergency Response Plan</u> : Develop and implement an Emergency Response Plan based on the risk hazard assessment undertaken as part of the environmental and social assessment.	Prior to initiating construction. Maintained throughout Project implementation.	BTL & Contractor	The plan prepared considers incident notification requirements under the ESCP and is disclosed in accordance with the SEP. Regular reports provide details on plan implementation.
4.7	<u>Security Management Plan</u> : Develop and implement a Security Management Plan to manage risks to human security of project-affected communities and project workers that could arise from the use of security personnel.	Prior to engaging security personnel/ prior to initiating construction. Maintained throughout Project implementation.	BTL & Contractor	Plan prepared and disclosed in accordance with the SEP. Regular reports provide details on plan implementation.
ESS 5: LAND ACQUISITION, RESTRICTIONS ON LAND USE AND INVOLUNTARY RESETTLEMENT				
	Not Applicable for this project			
ESS 6: BIODIVERSITY CONSERVATION AND SUSTAINABLE MANAGEMENT OF LIVING NATURAL RESOURCES				
	Not Applicable for this project			
ESS 7: INDIGENOUS PEOPLES/SUB-SAHARAN AFRICAN HISTORICALLY UNDERSERVED TRADITIONAL LOCAL COMMUNITIES				
	Not Applicable for this project			
ESS 8: CULTURAL HERITAGE				

<i>Summary of the Material Measures and Actions to Mitigate the Project's Potential Environmental and Social Risks and Impacts</i>	<i>Timeframe/ Completion Date</i>	<i>Responsibility/ Authority</i>	<i>Deliverables/ Indicator of Completion</i>
Not Applicable for this project			
Capacity Support			
Specify Training to be provided	Specify Targeted groups		Specify Training period

CHAPTER-9: RECOMMENDATIONS & CONCLUSION

9.1 RECOMMENDATIONS

The environmental assessment carried out for the proposed BTL sub-project of the BHTC suggests low to minor scale of adverse impacts, which can be reduced to acceptable level through recommended mitigation measures as mentioned in the EMP. As BTL will have sublease holders, who will be involved in manufacturing at the BTL's Block. It is recommended that the BTL should keep track of the sublease holders' activities and see that the suggested mitigation measures in this ESIA are adequately implemented. It is also recommended that the environmental monitoring plan may be revised from time to time in order to manage the unpredicted emerging impacts and take appropriate measures to offset any unexpected adverse effects.

Apart from risks associated with noise generation, solid waste, hazardous waste and wastewater disposal as a result of construction activities, there may be some degree of risk of accidents, that may endanger life and property. An emergency response plan (ERP) for the BTL has been developed; specifying various actions to be performed in a very short period of time; in a predetermined sequence if it is to deal effectively and efficiently with any emergencies like fire and other major accidental or natural disasters.

BTL should try to achieve the ISO certificates on Environmental and Occupational Health & Safety (i.e., ISO 14001:2015 (**Environmental Management Systems-Requirements with guidance for use**) and ISO 18001:2007 (**Occupational Health and Safety Management Certification**)) as the mark of successful environmental Management.

It will be the obligation of the contractor to submit their Environmental Management Action Plan (EMAP) before commencement of work and this should be clearly specified in the contract document; for which cost provisions are included in the contract BOQ. The EMAP should specify all affected environmental values, all potential impacts on environmental values, mitigation strategies, relevant monitoring together with appropriate indicators and performance criteria, reporting requirements and, if an undesirable impact or unforeseen level of impact occurs, the appropriate corrective actions available/undertaken.

9.2 CONCLUSION

The Environmental and Social Impact Assessment (ESIA) of the proposed BTL Technosity Limited has been carried in compliance to the WBG OP4.03 and WBG guidelines. As explained in the document. The document is also compliant to GOB Laws, Rules, guidelines and international conventions signed by the GOB. It is also compliant with Equator Banks' requirements.

The study demonstrated that proactive environmental actions mentioned in the report shall be incorporated in the project design, installation, construction and operational process.

Consultations with the project affected community and other stakeholders have been carried out and shall continue throughout the project lifecycle. Consultation and engagement meeting ensured that all the stakeholders' concerns about the proposed project were addressed to the satisfaction of the stakeholders.

Environmental baseline conditions (biophysical and socio-economic) as well as sensitive components of the study area were established through field data gathering/ sampling and complemented with information from the analysis of published literature, maps and information from articles on the project area. The established baseline data will serve as future reference and for monitoring purposes.

Climatic information was obtained from data published by GOB's department of meteorology. Results from laboratory analyses of surface water, groundwater, soil and sediments as well as air/ noise measurements were obtained from the area studied. The methodologies for quality assurance of the have been explained.

Air quality data shows that during dry season (December to May) AQ data especially PM_{2.5} levels exceeded NAAQS for a substantial number of days although there are no substantial air emission sources in the impact zone of the project (i.e., 10 km). Analysis in the report shows that the project will not add significantly to the local air emissions. Noise levels were found to be below regulatory limits. Surface water, groundwater, soil and sediment results showed that analyzed parameters were consistent across sample stations and compared well with control points values. It is observed that for groundwater is of high enough quality to meet the drinking water standard. Wastewater pollution may be a potential problem. The wastewater produced will be sent to CETP which is already operating for treatment. However, building-wise Mitigation measures for wastewater treatment using MBS/SBR technologies may also be built to meet the green building criteria.

Solid waste especially e-waste is a problematic issue and facility is currently available in the for its disposal in the country. BTL is tenant in BHTC Park, which is a GOB facility and it is being supported by another WB project PSDSP. The park authority has committed to build an e-waste facility. Until its services is available, the small volume e-waste produced will be kept in the storage for future disposal. As BHTC Park is a GOB facility, BTL qualifies for exemption for construction of a e-waste facility under clause 7 of WB OP4.03.

An Environmental and Social Action/Management Plan (ESA/MP) has been developed during this study to ensure that procedures for managing adverse impacts of the BTL facility operations as well as the implementation of the environmental and social commitments made are maintained throughout the duration of the project. The ESMP also contains the environmental monitoring program that would be used to monitor future changes to the environment from project activities. As a result, BTL would ensure that air pollutants, noise, surface water and groundwater are monitored in line with WBG standards.

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

REFERENCES

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