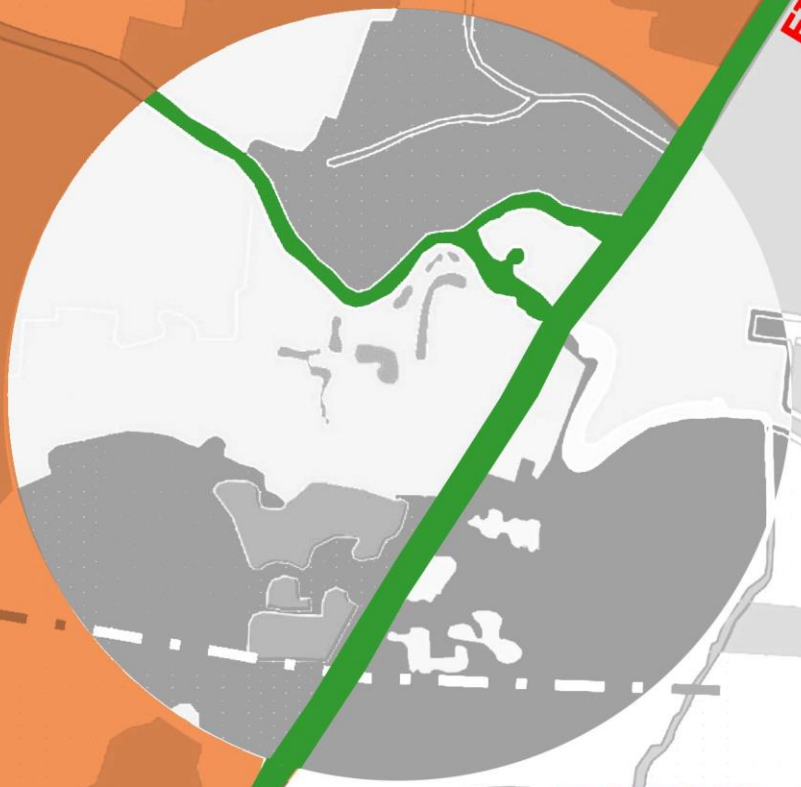

FINAL

DETAIL ENVIROMENTAL IMPACT ASSESSMENT OF SHEOLA LANDPORT

Bangladesh Trade and Transport Facilitation Studies RETF Project
(BLPA Component)

Bangladesh Land Port Authority (BLPA)
TCB Bhaban, 5th Floor, Kawaran Bazar,
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15th October 2016

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List of Acronyms

BLPA	Bangladesh Land Port Authority
CSC	Construction Supervision Consultant
DoE	Department of Environment
EA	Environmental Assessment
ECA	Environmental Conservation Act; Ecologically Critical Areas
ECC	Environmental Clearance Certificate
ECoP	Environmental Code of Practice
ECR	Environment Conservation Rules
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMP	Environmental Management Plan
ESIA	Environmental and Social Impact Assessment
E&S	Environmental and Social
FGD	Focus Group Discussions
GoB	Government of Bangladesh
GRM	Grievances Redress Mechanism
GRC	Grievances Redress Committee
IDA	International Development Association
IEE	Initial Environmental Examination
IUCN	International Union for Conservation of Nature
LC	Land Customs
MOEF	Ministry of Environment and Forest
MoS	Ministry of Shipping
NOC	No Objection Certificate
NGO	Nongovernmental Organization
OP	Operational Policy
O&M	Operation and Maintenance
PD	Project Director
PIU	Project Implementation Unit
PM	Particulate Matter
RPF	Resettlement Policy Framework
t	Metric ton or tonnne
ToR	Terms of Reference
USD	US Dollars
VOC	Volatile Organic Compounds
WB	World Bank
WBG	World Bank Group
WHO	World Health Organization

Executive Summary

A. Introduction

The Bangladesh Regional Connectivity Project 1 (the Project) is the proposed Project by the Government of Bangladesh (GoB) to lower time and costs associated with trade and improve infrastructure and conditions for trade along strategically important regional transport corridors. One of the components of the Project include investments to develop key land ports essential for trade with India and Bhutan. These include development of a new land port in Sheola, land port at Beanibazar, Sylhet. This Environmental Impact Assessment Report (EIA) presents the environmental assessment of the proposed Sheola Land Port (the Subproject). A Social Impact Assessment (SIA) and Resettlement Action Plan (RAP) have also been prepared for the Sheola Land Port and are presented in separate covers.

The above-mentioned project activities will impact environment. The project authority intended to develop and implement the project with sustainable manner as per DoE and WB guideline.

B. Policy, Legal Administrative and Regulatory Framework

The Environmental Conservation Act (ECA, 1995) is the main legislative framework related to environmental protection in Bangladesh. This umbrella Act includes laws for conservation of the environment, improvement of environmental standards, and control and mitigation of environmental pollution. In accordance with this Act, the proposed Project will need to be cleared by DoE before commencing the project following procedures given in the Environment Conservation Rules (ECR) 1997 amended on 2010. ECR classify the projects in to various categories (Green, Orange A, Orange B and Red) for the purpose of environmental clearances. Construction of land port is not included in the classification of different industrial units or projects list in ECR.

However, considering the previous experience of BLPA on obtaining environmental clearances for other land ports and scope of works involved in those ports, it can be expected that development of new land port or up gradation of existing land ports will also fall in to ‘Orange B’ category. The Project is expected to be categorized as “Orange” and hence BLPA will submit the following documents to DOE: An Initial Environmental Examination (IEE) with Environmental Management Plan (EMP).

Among the World Bank Safeguards, from an environmental perspective, the Environmental Assessment (OP/BP 4.01) is triggered. Since most of these impacts are site specific and can be mitigated with standard mitigation measures, hence the proposed project falls under category B. Environmental Impact Assessment (EIA) report prepared for Sheola land port in compliance with the WB policy. Stakeholder and Public consultation and disclosure requirements are performed duly on 7th June 16 and national consultation workshop are performed on 10th August 16 as per the World Bank policy DoE requirement.

C. Project Description

Overall Project and Components

Sheola Land Customs Station (LCS) started its operation the export and import activities were conducted with the Kushiyara river route since 1948. In 1996, this Sheola LC station was transferred to the Sutarkandi under Dubagh union near border line 2km away to the South-East location and started its activities as LC station depending of the road network only. But the name of this LC station remains named Sheola LC Station. Recently the number of vehicle using Sheola LC is increasing over time and the importance of the location considering, the Government has already declared the Sheola LC station as Sheola Land Port on 30.06.2015.

Sheola Land Port will be developed into two phases, phase 1 and phase 2. Phase 1 development year is 2016-2019 and operational from 2010 to 2030. Phase 2 development year 2027-2029 and operational year is from 2030 to 2040.

This EIA covers both phase 1 and phase 2 of project development; however, the World Bank is considering financing only Phase 1 of the 2-Phase development of the project. The implementing agency for this project is Bangladesh Land Port Authority (BLPA).

The proposed facilities to be built are:

- **Port facilities**: administrative building, ware houses, transshipment Sheds, open stack yards, and Bangladesh and India truck terminals;
- **Service Areas**: barrack, dormitory, restaurant, substation/generator and fuel house, and mosque;
- **Infrastructure**: fencing/boundary wall, internal road network, drains, footpath, parking, and landscaping, tree plantation along the boundary wall
- **Electrification Works**: area lighting, boundary wall lighting, footpath lighting, road lighting, substation equipment and diesel generators, and solar power;
- **Water Supply and Sanitation Works**: water supply, sanitation facilities solid waste collection
- **Safety and Security**: fire protection and detection, first aid facilities, CCTV system, intruder alarm system, car park management, access control system, physical security, and watch towers.

Other facilities like as toilet facilities for women, women-only waiting rooms and differently abled users, and address safety-related issues for all users. All terminals will be provided with separate women counters, waiting rooms and toilets for women passengers, and ramps for movement of differently abled people and need to be provided with drinking water facilities.

Associated Activities

Road Connectivity: The road from Sylhet to Sheola L.C Station is constructed by the LGED and Paved. But the road connectivity needs to be strengthened and widened for heavy vehicles. The existing road condition is adequate for five years initially for operation of the land port, but during later stages, the road needs to be improved. Therefore, its upgrading is not considered an associated activity under the proposed

World Bank project, given that it is not essential for the Phase 1 functioning of the port. At the time of the future second phase of development of the land port – which is not part of the proposed World Bank project -- the road will need to be strengthened.

Power Line: For operation of the port facilities, the capacity of an existing power line from Beanibazar to the proposed land port needs to be upgraded. The length of this power line will be 13 km. The new capacity will be added over the existing line along the road side. The work will be carried out by PDB, but BLPA shall seek to ensure that basic worker safety requirements are followed during its construction. In addition to the power line, a solar power of 25 kW and two generators will be installed and managed by BLPA at the site as a backup power source.

During construction, the site for the proposed construction will be used for establishing construction camps and material storage facilities. About 200,000 cubic meters of the borrow material would be required for filling of the land above the flood levels. The borrow material will be extracted from the abandon fallow land and pond of the area within 10 km. The location of borrow land is primarily identified Naya Dubagh, Uttar Dubagh, and un-utilized, non-agricultural land nearby Dubagh, Beanibazar area. This land and activities are associated with the project and are covered under this EIA.

D. Initial Screening and Scoping of Environmental Impacts

The Sheola land port is to be established around the existing port areas currently is being used by land customs station. The land port will be located in a flood plain land, which is a barren land during dry season and is being used for parking of vehicles, and some residential areas in the South side of the project. A summary of the potential impacts associated with the proposed land port development are given below along with potential mitigation measures:

- Some part of the proposed site is located in a flood plain land named Dubagh beel land hence filled with water during rainy season. An inland water basin, MurihaHaour, is located1.5 km South of Sheola land port. Generally, flood plains are fish spawning areas and haors are the fish habitats. Care should be taken to avoid waste water runoff from proposed port facilities to adjacent Dubagh beel and MurihaHaour.
- Fill material for land port land development will be collected from the abandon and unused land, silted pond and non-agricultural land near the Uttar Dubagh and Naya Dubagh area. During carrying of earth truck should be cover with triple and dust suppression through water sprays should be done.
- The major import item is coal about 97% of total import per year. Loading and unloading operation, store on the open stack yard and management of coal dust and coal wash water during rainy season should be control through equalization followed by multi-grade filter and this should be considered during design of the facilities.A spill basin should be constructed to remove the dirt, silt and other material in the storm water before discharge to the canal.
- Few residences are located near the South side of the proposed port site. Hence noise would be a major concern during the operation phase and dust will be less concern due to general wind flow from South to North. Major part of the port will

be constructed in North side. Adequate noise control measures such as developing buffer zones and tree plantation around the port facilities should be considered in the design of the port. Dust control measures, cover storage areas, sweeping and vacuum collecting equipment should be considered during design of the facilities.

No waste collection system, rotten and rejected goods and disposal facilities are not available. Waste collection and location of disposal facilities should be considered in the port design.

Rotten materials and rejected imported goods, solid wastes from all sources, contaminated soils or materials following spillage of fuels, oils and other chemicals, and waste effluents from workshops and washing bays, etc. initially collected in the separate bin and dispose properly to the Land ports own sanitary landfill. A small sanitary land fill with 3 acres of land with composting facilities should be implemented for mentioned waste. The Land Port itself should include adequate transfer facilities, collection and segregation of waste for recycling or final disposal. Three garbage bin should be provided in three suitable locations and fifteen litter bin provided in different locations.

All necessary waste management and final disposal infrastructure included in Phase-I development. Waste Management Cell with its institutional arrangement included in the final design of LP. Oil spill and grease will be collected separately and dispose to the DoE registered vendor for disposal after treatment.

- Separate facilities like toilets and waiting room in custom office and immigration counter for women traveller and traders should be design in the port facilities. Ramp facilities should be provided for disable people.
- A rainwater drain (canal) passes through the North side of project site, which carries rain water during monsoon and has a limited catchment area. The canal alignment is not straight, and has a mender and therefore canal erosion is noticed along the banks. Bank protection measures are required to control the erosion. The port site developed above the 100-year flood level data and also considered the climate change impacts.

E. Environmental Assessment

Environmental assessment (EA) of the Project has been carried out using Environmental Management Framework (EMF) provided by the World Bank Consultant. In the studies ensured all relevant environmental issues are mainstreamed into the design and implementation of the proposed project, ensure compliance of the Project with national and World Bank requirements, and conducting EIA for the Sheola Land Port project.

The following environmental issues were considered baseline survey of during EIA study.

i. Source of land fill material and land development
ii. Hydrology of the project area
iii. Biological species study (Flora and fauna, endangered species)
iv. Climatic condition (Temperature, rainfall, humidity)

v. Environmental quality (Air, water, noise)

vi. Socio economic condition (Population, demography, archeology, economy and culture, indigenous people, water supply and sanitation and affected person)

Mitigation measure developed as per impact identified.

F. Alternative Analysis

There are three potential options for multimodal transport, one through Kushiara river, which is located about 3 km north of the current Sheola LCS, and the second one is through railway line, which is located about 8 km south of the Sheola LCS, and third option is the Sheola LCS itself. Before partition of India in 1947, both the KushiaraRiver and railway line were used for transport of passengers and good. The current Sheola LCS location has been considered for further development, since India has already built huge land port infrastructure on the other side of the border.

Three options have been considered for finalizing the location of the port site. Analyzing all the options, Traditional design has been selected as it will give most of the benefit. The pros and cons of options that are analyzed for Traditional, Co-located or Juxtaposed, Staggered design.

Three layouts have been considered for the site development. The layout 1 is spread over 43.3 acres of land and includes facilities for private warehouses and traders. The Layout 2 is spread out 22.1 acres of land. The third layout is the selected option spread over in 22.1 acres of land and will not cover any facilities for the private traders. The selected layout 3 as better option and considered for design phase.

G. Stakeholder and Public Consultation

The stakeholder and public consultation program is an essential part of the environmental assessment process and has been undertaken both formally and informally throughout the study to ensure that the knowledge, experience and views of stakeholders and the general public are taken into account during the study. The information shared and recorded where relevant, been applied to justify design, construction methodology and timing changes, in order to reduce predicted negative effects. This approach satisfies statutory consultation requirements of the DoE.

The primary methods followed in the consultation process are:

- Individual level consultation/discussion;
- Key Informant Interview
- Focus group discussion;
- Free prior informed Public Consultation

In April 2016, meet Sheola Union Parishad Chairman requesting them to assist the Consultant with the organization of public meetings and FGD at a number of locations in the Project area. The Union Parishad Chairman were also asked to actively participate in, and in most cases chair the consultations.

Free prior informed public consultation meetings were held at Sheola during project preparation and to share the draft EIA report. A public consultation meeting was held on 7th May 2016 with the local communities. Notices about the consultation meeting were

circulated to the local communities through leaflets one week in advance of the meeting. Posters were also displayed at public places (at Union Parishad Bhavan, market). All types of stakeholder Upazila Chairman, UP chairman, Business leader, local elites, Imam of Mosque, Hotel owner, truck driver, C&F agent including project affected person (PAPs) were present and participated in the exchange view session. Additionally, meetings were also held with local government officials and customs officials. They are happy to know the implementation of the Sheola land port project. They want proper compensation for their land acquisition, loss of structure and livelihood and proper environmental mitigation measure during pre-construction, construction and operation period. They will cooperation in the project since their socio-economic condition will improve after implementation of the project.

A national consultation on draft environmental and social assessment study was held on 10th August 16 at BLPA auditorium in Dhaka. Photographs of these consultations are given at the end of report for local and national consultations, respectively. During these consultations, leaflets on key environmental and social issues were distributed to the participants (these were prepared in local language in Bangla) and big size posters were also displayed at the venue. Power point presentations were made by the environmental and social experts. Participants were encouraged to ask questions on the social and environmental issues.

Before the commencement of the EMP meetings the following materials were disseminated and invite all stakeholder and affected person, postering in important place one day before the consultation meeting, with the aim of developing positive and constructive relationships with stakeholders and improving their knowledge about the project and therefore enhance their ability to ask informed questions and to provide useful input and advice.

These materials were:

- Summary of the mitigations proposed during Project Disclosure meetings
- Written and visual information, including leaflet/brochure in Bangla, maps, drawings and diagrams, detailing the Project activities; and
- Identification of environmental impact including land fill
- The draft EMP
- Grievance Redress Mechanism (GRM)

General findings of the public consultation: Some issues, as described by those who attended in the consultation are summarized below:

Sands/earth used for filling the lowland, Acquisition of low land, small part of agricultural land and structure, Socio-Economic Benefit, Job facility and Communication, Accident, Noise pollution, Air pollution, Traffic congestion, Contribution of improvement of traffic communication system

H. Environmental Management and Monitoring Plan

The basic objective of the EMP is to manage adverse impacts of proposed project interventions in a way that minimizes the adverse impact on the environment and people at the subproject sties. The specific objectives of the EMP are to:

- Facilitate the implementation of the mitigation measures discussed earlier in the document.
- Maximize potential project benefits and control negative impacts;
- Draw responsibilities for BLPA, contractors, consultants, and other members of the project team for the environmental and social management of the Project;
- Define a monitoring mechanism and identify monitoring parameters in order to:
- Ensure the complete implementation of all mitigation measures,
- Ensure the effectiveness of the mitigation measures;
- Maintain essential ecological process, preserving biodiversity and where possible restoring degraded natural resources; and
- Assess environmental training requirements for different stakeholders at various levels.
- Contractor Code of conduct provided in the annexure.

The EMP will be managed through a number of tasks and activities and site specific management plans. One purpose of the EMP is to record the procedure and methodology for management of mitigation identified for each negative impacts of the subproject. The management will clearly delineate the responsibility of various participants and stakeholders involved in planning, implementation and operation of the subproject.

I. Institutional Arrangements

The Project implementation will be led by the Project Implementation Unit (PIU) that will be established within BLPA. The PIU will be responsible for procurement of consultants for carrying out the EIA and engineering designs for the proposed sub components. The PIU will be headed by the Project Director (PD). The E&S Cell will also provide trainings to the BLPA field personnel responsible for monitoring of environmental compliance including waste management call during both construction and O&M phases of the project. In addition, BLPA will recruit a permanent Environmental, Health and Safety Specialist in all the proposed land ports, who will be responsible for overseeing the environmental mitigation measures during operation and maintenance period.

The overall responsibility of environmental performance including EMP implementation of the Project will rest with the PIU.

Chapter -1: Introduction

1. INTRODUCTION

The Bangladesh Regional Connectivity Project 1 (the Project) is the proposed Project by the Government of Bangladesh (GoB) to lower time and costs associated with trade and to improve infrastructure and conditions for trade along strategically important regional transport corridors. One of the component of the Project includes investments to develop key land ports essential for trade with India and Bhutan. These include development of a new land port in Sheola, land port at Beanibazar, Sylhet.This Environmental Impact Assessment Report (EIA) presents the environmental assessment of the proposed Sheola Land Port(the Subproject). A Social Impact Assessment (SIA) and Resettlement Action Plan (RAP) have also been prepared for the Sheola Land Port and are presented in separate covers.

1.1 Background

Geographically, Bangladesh is well located to play an important role in the South Asia region as a logistic and transit country. It can facilitate movements between several surrounding countries especially between mainland India and its North East (NE) Region states, and landlocked Nepal and Bhutan as well as overland trade flows between South Asia and Myanmar and the rest of East Asia. Thus the land ports are strategically important for bilateral trade flows and through transit traffic movements across the region. Of the various flows, the greatest potential lies in the traffic moving between Northeast India and the rest of India. According to 2009 estimates, more than 40 million tons of traffic move annually through the Siliguri Corridor (a 40 km corridor located between Nepal and India, also known as the Chicken's Neck) between Northeast India and the rest of India. In addition, about another one million tons also move between Kolkata, Nepal and Bhutan. There is, therefore, potential that in addition to current bilateral flows, Bangladesh borders could handle a significant proportion of the more than 41 million tons of traffic (Table 1.1). These numbers reflect the current long transit route and do not reflect the enormous trade volumes that could increase a more direct transit route through Bangladesh and become facilitated.

Table 1.1: Major Regional Trade Flows in the NE Region of South Asia Region

Trade flow	Volume (million tons)
Rest of India – NE States	38.5
NE States – Rest of India	2.35
Nepal/Bhutan – Kolkata	0.92
Total	41.8

Source: Government of Bangladesh, 2011

1.2 The Proposed Subproject

The proposed Sheola Land Port (the Subproject), located on the Assam border, is one such potential land port that could be benefitted from enormous trade potential from mainland India to north eastern parts of India. A Land Customs station (LCS) already exists in Sheola since 1948, however in the current location since 1996 along with an immigration check post. The land port will be developed around these facilities in an area about 22 acres. The proposed subproject is located in the village of Borogram of Beanibazar Upazila of Sylhet district. The distance of Sheola from Beanibazar is 13km and 45km from Sylhet district Headquarter. The Indian part of it is called Sutarkandi, which is situated under Karimgang district of Assam State. The distance from Sutarkandi to Guwahati, capital of Assam is 341 km Location of Sheola Land Port is shown in Figure 1.1.

This EIA covers both phase 1 and phase 2 of project development; however, the World Bank is considering financing only Phase 1 of the 2-Phase development of the project. The implementing agency for this project is Bangladesh Land Port Authority (BLPA).The objective of the overall Project is to lower trade transaction costs associated with complying

with government regulatory requirements for import and export activities; reduce border crossing times at selected border crossing points; and enhance connectivity for trade along strategically important regional transport corridors. While, the expected outcomes of the subproject are: (i) reduction in border crossing time at Sheola, (ii) increased cross-border trade flows, (iii) enhanced connectivity between economic centers in Bangladesh and NE India states, and (iv) reduction in the time required to comply with regulatory requirements associated with import/export activities.

1.3 Environmental Assessment of the Project

Environmental Assessment of Sheola Land Port has been carried out in accordance with the EMF and RPF of the Project with an objective to:

(i) ensure all relevant environmental and social issues are incorporated /mainstreamed into the design and implementation of the proposed land ports,
(ii) consider in an integrated manner the potential environmental and social risks, benefits and impacts of the proposed subprojects and identify measures to avoid, minimize and manage risks and impacts while enhancing benefits, and
(iii) ensure compliance with national and World Bank requirements

1.4 EIA Study Methodology

This EIA has been prepared by the BLPA[1] and submitted to the World Bank for the project.

The methodology followed in preparing the EIA consists of the following steps:

- Review of available details of the Sheola land port and meeting/discussions with various stakeholders including local communities
- Review of the policy and regulatory requirements; and EMF
- Reconnaissance field visit and initial scoping and screening of the identified proposed investment sites to determine the key environmental parameters and aspects that are likely to be impacted by the project activities. The purpose of such screening is to get a preliminary idea about the degree and extent of potential environmental impacts of a particular sub-project, which would subsequently be used to assess the need for and the scope of further detailed environmental assessment.
- Field investigations to collect baseline data using structured questionnaires, and sampling and analysis for air, water and noise
- A detailed assessment of potential impacts of the Project activities and prepare detailed mitigation measures.
- Consultations at both local and national level with various stakeholders including affected communities

1.5 Contents of the EIA Report

Chapter 2 reviews the prevailing WB policies and national regulatory requirements relevant to environmental assessment. Chapter 3 presents description of the project and other salient information relevant for environmental assessment. Description of the baseline environmental conditions is presented in Chapter 4. Assessment of potential environmental issues as well as the appropriate mitigation measures to address these negative impacts have been discussed in Chapter 5. Chapter 6 presents the environmental management plan (EMP). Finally, Chapter 7 describes the consultations that have been carried out with the stakeholders and details of disclosure.

[1]BLPA engaged services of Yooshin and Vitti JV to prepare feasibility and detailed design of Shaula Land Port. The EIA team is led by Dr. Jagadish Chandra Saha with the support of Dr. VenkataNukala, an individual environmental consultant of Ministry of Shipping of GoB.

Figure 1.1: Locations of Proposed Sheola Land Port

Chapter -2: Policy and Regulatory Framework

2 Policy and Regulatory Framework

2.1 Applicable Legislation and Policies in Bangladesh

Bangladesh Environmental Conservation Act, 1995 and amended in 2010: The Environmental Conservation Act (ECA) of 1995 is the main legislative framework related to environmental protection in Bangladesh. This umbrella Act includes laws for conservation of the environment, improvement of environmental standards, and control and mitigation of environmental pollution. This Act has established the Department of Environment (DoE), and empowers its Director General to take measures that he considers necessary which includes conducting inquiries, preventing probable accidents, advising the Government, coordinating with other authorities or agencies, and collecting and publishing information about environmental pollution. According to this act (Section 12), no industrial unit or project shall be established or undertaken without obtaining, in a manner prescribed by the accompanying Rules, an Environmental Clearance Certificate (ECC) from the Director General of DoE. In accordance with this Act, the proposed Project will need to be cleared by DoE before commencing the project following procedures given in the Environment Conservation Rules (ECR) 1997 (discussed below).

Other Relevant Acts, Laws and Rules in Bangladesh: Other legislation relevant to the proposed project are listed below.

- **Bangladesh Environment Conservation Rules (ECR), 1997** empowers the GoB to declare ecologically critical areas, classification of industries and projects into various categories, procedures for issuing the environmental clearance certificate, and determination of environmental standards. According to the Rule 7 (1) of the Environmental Conservation Rules 1997; for the purpose of issuance of Environmental Clearance Certificate (ECC), every industrial units or projects, in consideration of their site and impact on the environment, will be classified into the four categories and they are: Category I (green), Category II (Orange-A), Category III (Orange B) and Category IV (Red). Development or upgradation of land ports are not included in any of these categories.

- **Bangladesh Wildlife (Protection and Safety) Act 2012** protects 1,307 species of plants and animals; and mandates imprisonment and fines for wildlife poaching, capturing, trapping, and trading. There is a risk that construction workers will kill the wildlife. Mitigation measures to address these risks are covered in EMF.

- **Bangladesh Wildlife (Preservation) Order (1973) and Act (1974)** regulates the hunting, killing, capture, trade and export of wild life and wild life products. It designates a list of protected species and game animals. It empowers the Government to declare areas as game reserves, wildlife sanctuaries, and national parks to protect the country's wildlife. Mitigation measures to address impacts on wildlife are covered in EMF.

- **The Bangladesh Labor Act, 2006** provides the guidance of employer's extent of responsibility and workmen's extent of right to get compensation in case of injury by accident while working. Mitigation measures to address workers' health and safety are included in the EMF.

2.1.1 Implication of GoB legal and regulations on the Proposed Project

The legislations relevant for environmental assessment for development of land ports are the Environmental Conservation Act 1995 (ECA'95) and the Environmental Conservation Rules 1997 (ECR'97). Department of Environment (DoE), under the Ministry of Environment and Forest (MoEF), is the regulatory body responsible for enforcing the ECA'95 and ECR'97.

Development or upgradation of land ports are not included in any of these categories mentioned in ECR 97. However, considering the previous experience of BLPA on obtaining environmental clearances for other land ports and scope of works involved in those ports, it can be expected that development of new land ports or upgradation of existing land ports will also fall in to 'Orange B' category. However, final decision on categorization will solely depend on the DOE based on their review of EA documents.

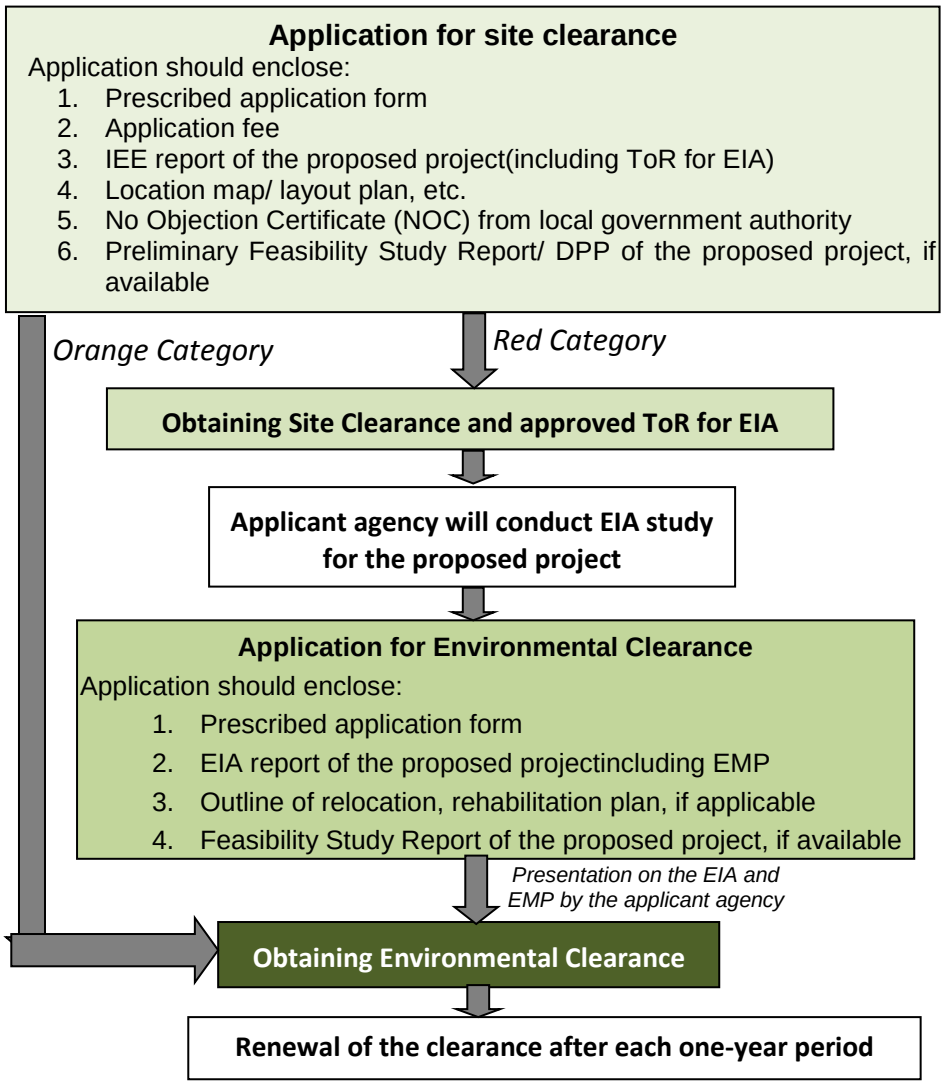
It is the responsibility of the BLPA as a proponent to conduct an environmental assessment of development proposal, the responsibility to review this assessment for the purpose of issuing Environmental Clearance Certificate rests on DoE. Based on the consultations with the DOE, the development of Sheola Land Port will be categorized as "Orange" and hence BLPA will submit the following documents to DOE:

- An Initial Environmental Examination (IEE)
- An Environmental Management Plan (EMP)

The IEE will be a checklist on the proposed activities involved in subproject development. On review of the above documents, the DOE will give the environmental clearance for the Project.

For "Red Category' Projects, the documents to be submitted to DOE are: (i) an Environmental Impact Assessment (EIA) and (ii) an Environmental Management Plan (EMP). The environmental clearance procedure for both Orange and Red Category projects can be summarized in the Figure 2.1.

Figure 2.1: Process of obtaining Clearance certificate from DoE



2.2 International Treaties signed by Bangladesh

Bangladesh is a signatory to a number of international environment-related treaties, conventions, declarations and protocols. The following are the relevant international treaties and conventions to which Bangladesh is a party:

- Convention of Biological Diversity, 1992 (Biodiversity convention – Rio de Janeiro). The Convention has three objectives: the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising out of the utilization of generic resources. All parties are required to cooperate for the conservation of biodiversity, in respect of areas beyond national jurisdiction and other matters of regional interests, and must develop national strategies for the conservation and sustainable use of biodiversity and integrate this into sectional or cross-sectional guidelines.
- 1974 Convention on Wetlands of International Importance especially as Waterfowl Habitat (RAMSAR). The Convention requires states to designate at least one wetland site on the basis of its ecology, biology, zoology, limnology or hydrology and requires the conservation of wetlands by establishing nature reserves. There is also a requirement that any loss of wetland should be compensated for by creation of new habitat.

- United Nations Framework Convention on Climate Change, Rio de Janeiro (1992). The convention is broadly applicable due to project construction and operation activities. Mitigation measures to address greenhouse gases emissions are covered in the EMF;
- Vienna Convention for the Protection of the Ozone Layer, Montreal (1987). Mitigation measures to address greenhouse gases emissions are covered in the EMF;
- Convention on Conservation of Migratory Species of Wild Animals (1979). Migratory birds visit the project areas and mitigation measures to address impacts on migratory birds are included in the EMF;
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Washington (1973). This is not directly relevant to the project since the project does not involve in any international trade of endangered species of wild fauna and flora. General restrictions have however been included in the Environmental Code of Practice;
- Convention concerning the Protection of World Culture and Natural Heritage (World Heritage Convention) (1972). Though directly not applicable to the project since there are no such known sites are located in the project area – measures to address chance finds are included in the EMF;
- Kyoto Protocol (1997) and Copenhagen Accord (2009) on climate change. Mitigation measures to address greenhouse gases emissions from the project activities are included in the EMF.
- The Minamata Convention on Mercury (2013) to protect human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds. This Convention was a result of three years of meeting and negotiating, after which the text of the Convention was signed by delegates from 140 countries on 19 January 2013. According to this convention, the trade related to mercury containing products will not be allowed through the land ports.
- The Paris Agreement (2015) is an agreement on climate change dealing with greenhouse gases emissions mitigation, adaptation for holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change. This agreement may be applicable to the project because use of emissions related to the construction and operation of land ports.

2.3 World Bank Safeguard Policies

The World Bank has developed a number of Safeguard Policies to ensure that all possible impacts are considered and mitigation measures are spelled out prior to the implementation of any proposed project. These policies ensure that the quality of operations is uniform across different settings worldwide. If the decision is taken that a Safeguard Policy should be applied, mitigation measures and plans must be developed and should be in place before the implementation of a proposed project.

The Bank requires environmental screening and classification for all investment projects proposed for Bank financing, to help ensure that they are environmentally and socially sound and sustainable. Screening and classification take into account the natural environment (air, water, and land); human health and safety; social aspects (including especially involuntary resettlement and presence of Indigenous Peoples); cultural property; and trans-boundary and global environmental aspects.

The objectives of environmental screening and classification are: to evaluate the environmental risks associated with a proposed operation; to determine the depth and breadth of Environmental Assessment (EA); and to recommend an appropriate choice of EA instrument(s) suitable for a given project. The Bank recognizes that environmental screening and classification is not absolute and involves professional Judgment on a case by case

basis. When screening, careful consideration needs to be given to potential environmental impacts and risks associated with the proposed project. Judgment is exercised with reference to the policy expectations and guidance; real impacts on the ground; and established regional and Bank-wide precedence and good practice.

The applicable WB safeguard policies are described below. In the following section, a table is provided indicating how each policy applies to the proposed investments.

2.3.1 Environmental Assessment (OP/BP 4.01)

EA requirement. The World Bank requires environmental assessment (EA) of projects proposed for Bank support to ensure that they are environmentally sound and sustainable, and thus to improve decision making. The Bank Policy OP/BP 4.01 considers that EA is a process whose breadth, depth, and type of analysis depend on the nature, scale, and potential environmental impact of the proposed project. EA evaluates a project's potential environmental risks and impacts in its area of influence; examines project alternatives; identifies ways of improving project selection, sitting, planning, design, and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts; and including the process of mitigating and managing adverse environmental impacts throughout project implementation. EA takes into account the natural environment (air, water and land); human health and safety; social aspects (involuntary resettlement, indigenous peoples and physical cultural resources); and trans-boundary and global environmental aspects. The Bank Policy also envisages that the borrower Government is responsible for carrying out the EA and the Bank advises the borrower on the Bank's EA requirements.

EA classification. The World Bank classifies the proposed project into one of the four categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts. These categories are defined below.

- ***Category A:*** A proposed project is classified as Category A if it is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works.
- ***Category B:*** A proposed project is classified as Category B if its potential adverse environmental impacts on human populations or environmentally important areas--including wetlands, forests, grasslands, and other natural habitats--are less adverse than those of Category A projects.
- ***Category C:*** A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental impacts. Beyond screening, no further EA action is required for a Category C project.
- ***Category FI***: A proposed project is classified as Category FI if it involves investment of Bank funds through a financial intermediary (FI), in subprojects that may result in adverse environmental impacts.

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2.3.2 Involuntary Resettlement (OP/BP 4.12)

The WB's experience indicates that involuntary resettlement under development projects, if unmitigated, often gives rise to severe economic, social, and environmental risks: production systems are dismantled; people face impoverishment when their productive assets or income sources are lost; people are relocated to environments where their productive skills may be less applicable and the competition for resources greater; community institutions and

social networks are weakened; kin groups are dispersed; and cultural identity, traditional authority, and the potential for mutual help are diminished or lost. This policy includes safeguards to address and mitigate these impoverishment risks.[2]

The overall objectives of the Policy are given below.

- Involuntary resettlement should be avoided where feasible, or minimized, exploring all viable alternative project designs.
- Where it is not feasible to avoid resettlement, resettlement activities should be conceived and executed as sustainable development programs, providing sufficient investment resources to enable the persons displaced by the project to share in project benefits. Displaced persons should be meaningfully consulted and should have opportunities to participate in planning and implementing resettlement programs.
- Displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.

2.3.3 Environment, Health and Safety Guidelines

The Environment, Health, and Safety (EHS) Guidelines[3]contain the performance levels and measures that are generally considered to be achievable in new facilities or project by existing technology at reasonable costs. In addition, there are also industry specific EHS guidelines.

[2] Excerpts from WB OP 4.12 WB Operational Manual. December 2001.

[3] EHS Guidelines available at: http://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES

2.3.4 Applicable World Bank Policies to the Subproject

The applicable World Bank policies for the development of Sheola Land Port are given in Table 2.1.

Table 2.1: Triggering the World Bank Policies for Subprojects

Directive	Policy	Applicability for the Subproject	Explanation
Environmental Assessment	OP/BP 4.01	Triggered.	Construction and operation of land ports expected to cause impact on natural environment (air and noise quality) and health and safety of local community and workforce. This subproject falls into Category B since most of these impacts are site specific and can be mitigated with standard mitigation measures.
Natural Habitats	OP/BP 4.04	Not Triggered.	No natural habitats are located in near the subproject
Pest Management	OP 4.09	Not triggered.	The subproject will not procure any pesticides, nor will they induce an increased use of pesticides.
Physical Cultural Resources (PCR)	OP 4.11	Not triggered.	No PCRs located in the proposed subproject
Indigenous Peoples	OP/BP 4.10	Not triggered	There are no indigenous people near the subproject
Involuntary Resettlement	OP/BP 4.12	Triggered	22.1 acres of Land is required for project infrastructure facilities. A Resettlement Action Plan (RAP) has been prepared under separate cover, detailing the relevant requirements to ensure compliance with this policy.
Forests	OP/BP 4.36	Not triggered.	No forests are located in the proposed port area
Safety of Dams	OP/BP 4.37	Not triggered	No dam are located near the project.
Projects in International Waterways	OP/BP/ GP 7.50	Not triggered	No international waterways are located near the project. The Kushiara river is located about 3 km from the project site.
Projects in Disputed Areas	OP/BP 7.60	Not triggered	The subproject is not located in a disputed area
Child labour		Not Triggered.	National laws on child labour will be strictly followed. No child labour will be hired by the contractors or subcontractors in any of the project activities.
Access to Information		Applicable to the project.	EIAwill be disclosed in country (on BLPA website) and will be sent to WB InfoShop.Public consultations with local community were held at Dubagh Union Parishad Bhaban on 7th May 2016. A national level public consultation was carried out on August 10, 2016. The executive summary of the EIA will be translated to Bangla will be made available in hard copy in locally accessible locations in the project area, including BLPA/Customs offices.

2.4 Compliance Status with Bangladesh and World Bank Requirements

The present compliance status of the project with Bangladesh legislation and World Bank safeguard policies is indicated in Table 2.2.

Table 2.2: Compliance of the Project with GOB Legislation and World Bank Safeguard Policies

Policy	Legislation/Policy	Actions Taken to Comply
GoB requirements	Environmental Conservation Rules	BLPA will submit IEE with EMP to DoE for environmental clearance certificate
	International treaties	Verification of protected sites, Red List and protection of vulnerable habitats in environmental screenings and assessments of the Sheola land port. No such protected or vulnerable sites are noticed in the project area.
	Public information and disclosure	The draft EIA report will be disclosed on BLPA's website. Public consultations meetings were held on Dubagh Union Parishad Bhavan (2km from the Shula land port site), on 7th May 2016, at Sheola and to solicit stakeholder feedback. National public consultation workshop was held on 10th August 2016 at Dhaka.
World Bank requirements	Early Screening and Scoping	Screening using structured questionnaires was carried out during the feasibility study of the Project.
	Participatory approach	Key informant interviews, participatory rural appraisals, consultation meetings and focus group discussions were held between March and May 2016.
	Integrate environmental and social assessment	Natural environment, public health, and social aspects are incorporated into EIA.
	Natural Habitats	Verification of protected sites and ecosystems, Red List and endangered flora and fauna has been done Sheola Land Port. No protected and ecosystems are located in the project area.
	Risk assessment	Health and safety risks for population and workers are identified in the EIA and management measures will be included in tender documents. BLPA capacity will also be strengthened on health and safety risk management.
	Climate Change and Floods	Impact of floods and climate change effects are considered for design of the Sheola land port.
	Alternatives	Alternatives have been considered for location of proposed land port including multimodal transport alternatives; and various layouts for siting of required facilities in the selected area.
	Pollution	Baseline survey of air, noise and water quality has been carried out. Environmental Code of Practices (ECoPs) are included in contractors‟ bidding documents
	Physical Cultural Resources	No physical, cultural resources which warrant special treatment under the World Bank OP 4.11 were identified in the proposed land port area. No mosques or graveyards are located in the proposed land port area.
	Social impacts	For negative social impacts on land/assets/livelihood/access to resources etc. mitigation plans will be prepared in keeping with the Bank's Operational policies triggered.
	Gender	Women participated in the consultation meetings. In the project design, female waiting rooms and toilets are included in the project design.
	Public Health	Public health aspects were studied and public health impacts are covered in EIA
	Consultation and access to information	The EIA will be disclosed on BLPA website and will also be sent to WB InfoShop. The executive summary of the EIA has been translated to Bangla and was circulated to local community. Public consultations were held in held on 7th May at Dubagh Union Parishad Bhabannearthe subproject area. A national public consultation workshop was held in Dhaka on 10th August 2016.

Chapter -3: Project Description

3 PROJECT DESCRIPTION

3.1 Description of Overall Project and Its Components

Bangladesh Regional Connectivity Project 1 (the Project) will finance interventions aimed to facilitate connectivity, trade and transport for national and regional trade. The Project consists of three components as follows:

***Component 1: Investments in infrastructure, systems and procedures to modernize and improve connectivity of key land ports essential for trade with India and Bhutan (BLPA-managed Component*)**.

- ***Component 1a: Land Ports Infrastructure:*** The land port proposed for development at Sheola, Beanibazar, Sylhet. Sheola is a key border crossing between Bangladesh and Sutarkandi of Assam state in Northeast India. There are currently rudimentary facilities and BLPA plans to develop this facility into a formal land port facility.
- ***Component 1b: Land Port Modernization and Process/Efficiency Improvement.*** Studies conducted during project preparation at Sheola identified significant opportunities for improvement in efficiency and effectiveness in land port operations through the streamlining and simplification of BLPA operational and business processes supported by the introduction of appropriate information technology. The automation of these processes will complement the reform and modernization activities at Sheola land port that will be implemented as part of the National Single Window and will focus predominately on internal BLPA processes particularly those associated with traffic management, warehousing operations, rationalization of the wide range of BLPA fees and charges as well as their collection and payment. Significant improvements could also be realized by policy and procedural changes not associated with the implementation of ICT. The Sheola Land Port component will therefore finance detailed work on reengineering existing manual systems to identify opportunities for improvement and will identify functional requirements for automation of processes not planned to be included in the National Single Window system. It will also consider the impact of the BBIN Motor Vehicle Agreement that, once appropriate implementation protocols are developed, will likely impact heavily on land port operations. In addition, to improve physical security, enhance cargo control of bonded goods and better manage risks posed by the unique physical circumstances presented by the Benapole land port facility, the sub-component will finance the construction of a secure perimeter fence as well as the procurement of an automated gate pass system and related entry and exit gate control equipment.

- ***Component 1c: Preparation Studies and Activities to Enhance Connectivity of Land Ports and Project Implementation Support.*** The access or connecting roads to many of BLPA's land port require strengthening or expansion to support increased trade, including at Sheola. This sub-component supports BLPA in financing preparatory studies for potential future investments in infrastructure that supports use of the land ports, such as improvements to access and connect roads. Support to BLPA's Project Implementation Unit is also incorporated in this sub-component including for project management, procurement, financial management, and environmental and social safeguards management.

Component 2: Support coordination for trade, and economic empowerment opportunities for women (IDA US$7 million managed by Ministry of Commerce, WTO Cell).

- ***Component 2a: Support the (Inter-ministerial) National Trade and Transport Facilitation Committee.*** Coordinating the multiple trade-related agencies in any country is a complex resource-intensive task. Moreover, the trade-related agencies require support for analytical work and technical assistance to develop specific trade-related projects, as well as on-demand just-in-time support for trade-related transactions. To strengthen trade-related institutional capacity, this component will finance support to strengthen Bangladesh's National Trade and Transport Facilitation Committee to ensure active and sustainable cooperation between multiple trade-related stakeholders and finance on-demand technical studies for specific topics that enhance trade.
- ***Component 2b: Develop (pilot) programs to support female traders and entrepreneurs.*** This sub-component will support activities or programs that support data collection on women's trade and entrepreneurial activities, as well as support capacity development for women in selected sectors where there are significant economic opportunities for women. A feasibility study and consultations are ongoing to select the most appropriate activities for piloting. Successful pilots can be scaled up in follow-on operations.

Component 3: National Single Window Implementation and Strengthening Customs Modernization. The lead implementation agency for this component is the Customs Department in National Board of Revenue.

- National Single Window Implementation. To improve its international trading performance, Bangladesh has committed to implement a National Single Window. The Bangladesh National Single Window (BD-NSW), through the introduction of an electronic, online solution, will facilitate faster and more transparent international trade procedures, reduce transaction costs borne by traders and provide consistency and certainty to the total process, from the start of the regulatory requirements to the processing and clearance of goods. The BD-NSW will deliver a user-friendly, electronic system that streamlines and automates procedures for registered private sector stakeholders and Government Agencies to facilitate the application, processing and issue of various international trade related permits, licenses, certificates and their integration with Customs declaration processing, clearance and payment of fees and taxes.

- Strengthening Customs Modernization through: (i) Implementation of a sophisticated Risk Management Module as well as providing resident technical support for its implantation and operationalization and ensuring its contribution to improving compliance management capabilities across an 18-24 months period in all trade-related agencies; and, (ii) Implementation of a Valuation (Price Reference) database as well as its full integration into the National Single Window system. The required system implementation and operationalization support to be financed by the Project will build upon and further strengthen initiatives currently underway supported by WBG's Trade and Competitiveness Practice under a parallel technical assistance project.

- ICT Infrastructure for selected Land Ports/Border Crossings including Hardware, Communications Infrastructure including last-mile connectivity between crossing points and Government Network backbone.

3.2 Proposed Developments in Sheola Land Port

Details of the facilities to be built in the proposed Sheola land port are given in Table 3.1. Layout drawing of the proposed facilities are given in Figure 3.1 and a rough aerial view of the facilities is given in Figure 3.2. The proposed facilities to be built are:

- **Port facilities**: administrative building, ware houses, transshipment Sheds, open stack yards, and Bangladesh and India truck terminals;
- **Service Areas**: barrack, dormitory, restaurant, substation/generator and fuel house, and mosque;
- **Infrastructure**: fencing/boundary wall, internal road network, drains, footpath, parking, and landscaping, tree plantation along the boundary wall
- **Electrification Works**: area lighting, boundary wall lighting, footpath lighting, road lighting, substation equipment and diesel generators, and solar power;
- **Water Supply, Sanitation and Solid Waste Management Works**: water supply and sanitation facilities; collection facilities and landfill for solid waste management
- **Safety and Security**: fire protection and detection, first aid facilities, CCTV system, intruder alarm system, car park management, access control system, physical security, and watch towers.

Table 3.1: Compliance of the Project with GOB Legislation and World Bank Safeguard Policies

A. Land Development		
Land Development (filling of the land above flood level)	-	89,468 m^2(≒ 3.66 m depth filling)
Boundary Wall	-	2,508 m long &1.50 m height
Internal Road Network	-	13.5 m wide ~ 196 m long 10.5 m wide ~ 774.0 m long 7.0 m wide ~ 125.0 m long
Footpath	-	1.5 m wide ~ 2,200.0 m long
Parking Bridge	~ ~	3.0 m wide ~ 1100.0 m long 840.0 m^2 12.00.mwide 42.0 m long
Landscaping	-	Plantation, Greenery, soft & hard landscaping
B. Building and Other Infrastructure		
Port Facilities		
Administrative Building(4-Storied),	-	2,397.70 m^2
Ware house1 no's	-	2,792.00 m^2
Transshipment Yard Shed 2 no's	-	2,800.00 m^2
Open Stack yard	-	6,000.00 m^2
Bangladesh & India Truck terminal	-	15,344.00 m^2
Inspection Building	-	304.00 m^2
Service Area		
Barrack (Border)	-	720.00 m^2
Dormitory-2 Storied	-	720.00 m^2
Guesthouse	-	720.00 m^2
Pump House &sub station	-	470.00 m^2
Store Building	-	470.00 m^2
Sand filtration	-	1130.00 m^2
C. Basic Services		

Area Lighting	-	85058.0 m^2
Boundary wall lighting	-	2,508.0 m
Footpath lighting	-	3,300.0 m
Road Lighting	-	1,005.0 m
Substation Equipment & Diesel Generator	-	1,600 KVA -2 no's, Sub-station, 650 KVA-1no, Diesel generator 110 KVA – 1 no's, Double Generator (Server)
Solar Power	~	25,000 W
Underground Water Reservoir	-	100 m^3
External Drainage	-	2,800 m
Deep tube-well 2 nos.	-	150 mm dia 230 M long
D. Equipment and Plants		
	~	
Weighing Bridge	-	100 metric ton capacity 2 no's
IT Solution	-	Networking & Cabling, Server, Internet Uplink
E. Safety & Security		
Fire Protection, Fire detection CCTV System, Alarm, PA, BMS, Watch Tower, Gate etc.		

Figure 3.1: Details of Proposed Facilities at Sheola Land Port

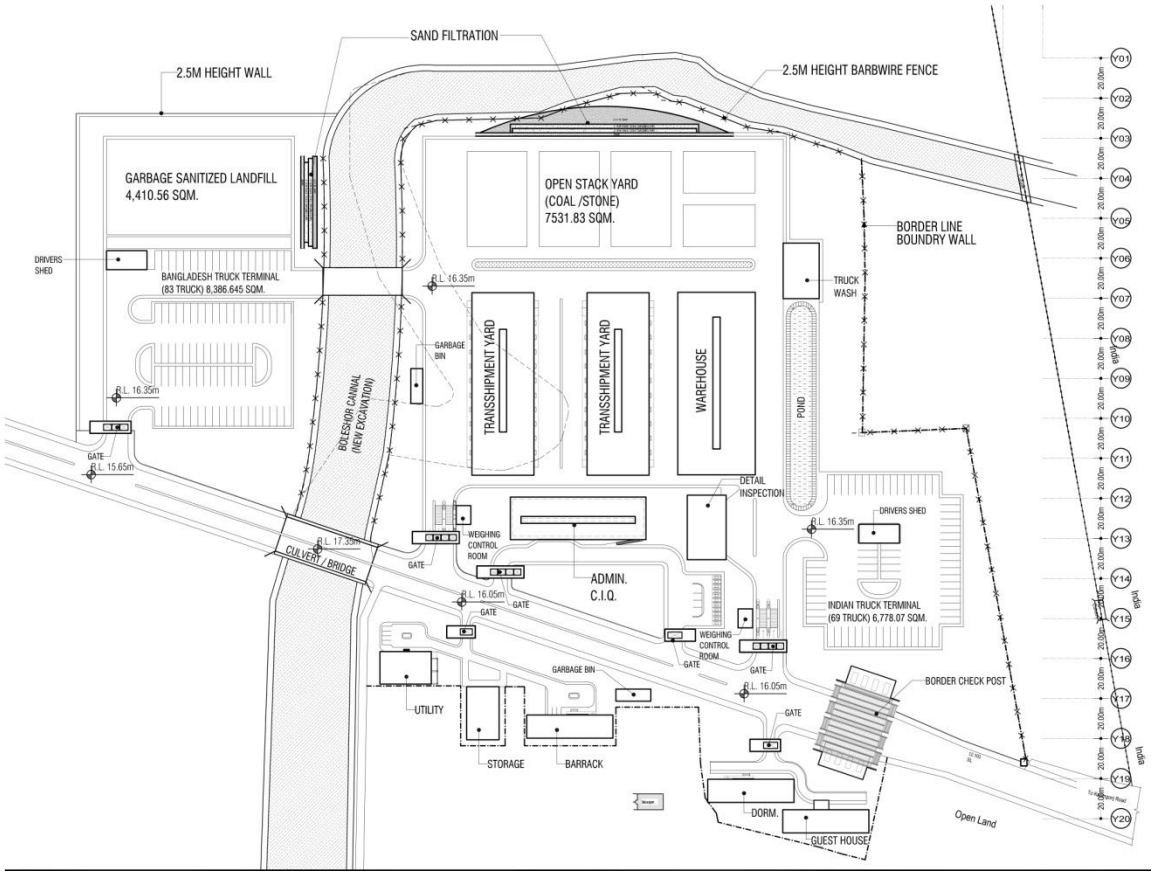


Figure 3.2: A rough aerial view of the proposed Sheola Land Port

3.3 Associated Activities

Road Connectivity: The road from Sylhet to Sheola L.C Station is constructed and paved by the LGED. But the road connectivity needs to be strengthened and widened for heavy vehicles. The existing road condition is adequate for at least an initial five years of operation of the land port. Therefore, its upgrading is not considered an associated activity under the proposed World Bank project, given that it is not essential for the Phase 1 functioning of the port. At the time of the future second phase of development of the land port – which is not part of the proposed World Bank project -- the road will need to be strengthened.

Power Line: For operation of the port facilities, an existing power line from Beanibazar to the proposed land port needs to be extended. A 3200 KVA power line to be added by PDB from the possible nearest GRID, which is 13 km distance. This is considered an associated activity of the project from the EIA perspective.

The power line will, however, be extended over the existing line along the road side. Hence there is no additional Impact of electromagnetic radiation, and no new land acquisition for new towers, hence no crop loss or tree cutting will be required. Only during extension work, safety measure will be required. BLPA will ensure that appropriate worker safety provisions are included in the contract issued by PDB.

In addition to the power line, a solar power of 25 kW and two generators will be installed as a backup power source. These facilities are not “associated” but rather will be directly developed and operated by BLPA as part of the proposed project.

During construction, the site for the proposed construction will be used for establishing construction camps and material storage facilities. About 327,452.88 cubic meters of the borrow material would be required for filling of the land above the flood levels. The borrow material will be extracted from the abandoned fallow land and pond of the area within 3 km.The location of borrow land is primarily identified Naya Dubagh, Uttar Dubagh, and un-

utilized, non-agricultural land nearby Beanibazar area. These areas are therefore associated with the project, and are covered under this EIA.

3.4 Current and Future Trade

Details of current imports and exports at Sheola land customs station are given in Table 3.2 and Table 3.3 respectively. Predicted Trade Volume at Sheola Land Port is shown in Table 3.4. Major imports are coal which accounts for nearly 97% of the imports. This coal is mainly used in Sylhet and surrounding areas for brick kilns. The goods that are generally imported and exported at Sheola port are given below:

Import Item: Coal, stone, orange, ginger, Satkara, onion, apple, mango and cement clinker, scrap, sitrus, Tomato, Banana.

Export Item: Chips, chanachur, lollipop, ice pop, milk candy chocolate, ketchup, energy drinks, mango drinks, power drinks, Pran up, cement, plastic products, cotton, lacca vermicelli, mobile pop, litchi drinks, melamine products, ceramic products, brick breaking machine, tissue paper, caustic Soda, soap, liquid chlorine gas, tube well, Otobi furniture, different types of fishes, dry cell battery, liquid chlorine gas, hydrogen peroxide, D.C & fatty Acid, Citagur (Molasses), Business Materials, C.I Sheet,

Table 3.2: Imports of SheolaLCS (2014-2015)

Sl. No.	Description	Quantity (M.Ton)
1	Coal	96458
2	Mango	3
3	Augor Deck	3.53
4	Tomato	8.00
5	Scarp	30
6	Orange	1163
7	Sitrus	14
8	Zinger	1615
9	Apple	26.114
10	Pan	1.64
11	Banana	2.050
Total		**99,324.94**

Table 3.3: Exports of SheolaLCS (2014-2015)

Sl. No.	Description	Quantity (M. Ton)
1	Food (Pran, Bangle)	10978.52
2	Cement	18025
3	Caustic Soda	1730
4	Waste Cotton	851
5	Liquid Clorine Gas	1603.80
6	D.C & fatty Acid	466.625
7	Brick broken machine	6.00
8	Plastc Materials	637.841
9	Readymade wear	60.187
10	Net	8.00
11	Fish	171.75
12	Tissue Paper	32.351
13	Soap	58.225
14	Tube well	54.447
15	Water Tank	0.667
16	Malamine	27.073

17	Ceramic	20.529
18	Otobi furniture	6.308
19	Hydrogen Per Oxide	45
20	Citagur (Molasses)	14
21	Germents Materials	5.275
22	Busniess Materials	0.677
23	Football	0.178
24	C.I Sheet	33.55.5
Total		**34803.45**

Table 3.4: Predicted Trade Volume at Sheola Land Port

items	2020	2025	2030	2035	2040
Import	228,191	445,625	789,250	1,221,419	1,724,668
Export	66,617	134,695	251,203	412,871	633,822
Total	294,808	580,320	1,040,454	1,634,290	2,358,490

3.5 Analysis of Alternatives Considered during Project Planning and Design

3.5.1 Alternatives for Single Modal and Multi Modal Transport

There are three potential options for multimodal transport, one through Kushiara river, which is located about 3 km north of the current Sheola LCS, and the second one is through railway line, which is located about 8 km south of the Sheola LCS, and third option is the Sheola LCS itself. Before partition of India in 1947, both the Kushiara river and railway line were used for transport of passengers and good. The current Sheola LCS location has been considered for further development, since India has already built huge land port infrastructure on the other side of the border.

3.5.2 Alternatives for Location of the Land Port

Three options have been considered for finalizing the location of the port site. Analyzing all the options, Traditional design has been selected as it will give most of the benefit. The pros and cons of options that are analyzed are given here, for an instance.

Traditional

- This type of LP has a wide level of acceptability because both has a long history of using such method of border management
- Infrastructure like Road and Truck Terminal has been set up already in Indian side
- Handling of goods/vehicles/labours is more effective and easy in this method
- Cross border coordination is required at a reduced level
- Interministrial correspondence is required at a limited level that will increase the speed of operation at any level
- Only road development is required to get maximum benefit from this type of management
- LC stations of both of the countries will enjoy absolute independence functionally and operationally
- Land port authority will be able to execute and exercise their command at a highest level
- Above all, all of these facilities and advantages would be made possible only with this option
- An option for transporting freights via railway is still there with construction of only 9 km railway line

Co-located or Juxtaposed

- In India, a truck terminal has been constructed already at a distance of 850 meters from the LC station of Bangladesh
- BSF Camp is at a distance of 350 meters from the part.
- The Reduced Level (RL) of Land in Indian part is less, that will increase the cost of any kind of construction including land filling, pre-cast piling etc.
- Coordinated effort for transhipment will not be very effective in this pattern due to difference in language, religion, social, nature and behaviour of people and truck driver is different of diversity.
- Infrastructure within no man's land is highly restricted by both of the neighbouring government

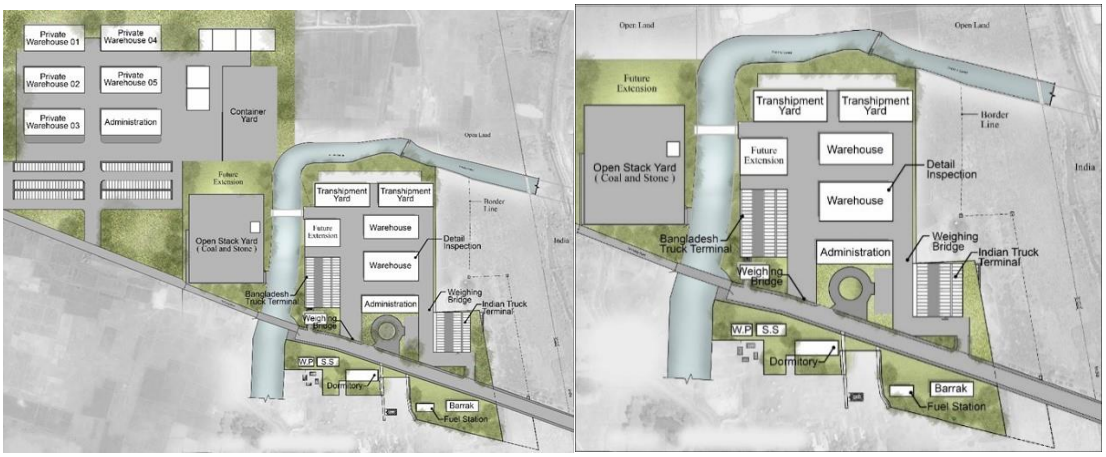
Staggered

- Coordination will not be very strong in LP due to the composed team of different countries
- Such type of poor coordination may result in mismanagement of the LP area

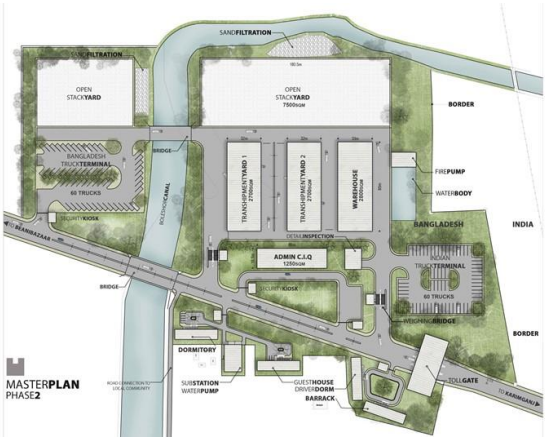
3.5.3 Alternatives Land use for the Land Port

Three land use layouts have been considered for the Land port site development. The layout 1 is spread over 43,3 acres of land and includes facilities for private warehouse and traders. The other two layout spreads over in 22.1 acres of land and will not cover any facilities for private traders. The option 1, 2 and 3 is given in Figure 3.3.Comparison of the Proposed Layout Options is shown in Table 3.5.The selected better option should be considered for design in the design phase.

Figure 3.3: Option 1: Proposed Layout for Sheola Land Port



Option -1 **Option -2**



Option -3

A comparative analysis of both the options are given in Table 3.5

Table 3.5: Comparison of the Proposed Layout Options

Description	Option 1	Option 2	Option 3
Area of Land Port	Total site area 43.3 acre The purpose of this option is to include private truck terminals in the land port. The port can rent the facilities to private people. Also can be used for future expansion	Total Site Area: 22.1 Acre Land Port Area:18.42 Acre Service Area: 3.682 Acre	Total Site Area: 22.1 Acre This option is to develop the land port facilities for next 20 years.
Land acquisition	More land acquisition cost	Less land acquisition cost	Less land acquisition cost
Tree cut	10 no's	5 nos	5 no's
Ffuture extension	Opportunity of future extension and construction of new infrastructures.	No opportunity of future extension and construction of new infrastructure.	No opportunity of future extension and construction of new infrastructure.
Private warehouse for storage facilities	This proposed land port includes private warehouse for storage facilities and container yards.	No private warehouse and storage facilities	No private warehouse and storage facilities. There will be possibility of haphazard development and construction
Land Use	22.1 acres are similar to Option 2. The rest of the area is not currently being used for any purposes (flood plain land)	The 22.1 acres of land is under flood plain land, only structure placement arrangement is different.	The 22.1 acres of land is under flood plain land, except some areas where structures were already built
Environmental	More land filling more negative impact	Less land filling, less impacts	Less land filling, less impacts
Project cost	More primarily due to additional land acquisition	Less due to less land acquisition	Less due to less land acquisition
Conclusion	Not selected	Not selected	Selected because of less land and the future trade volumes beyond 20 years are not known.

3.6 Phase Wise Development

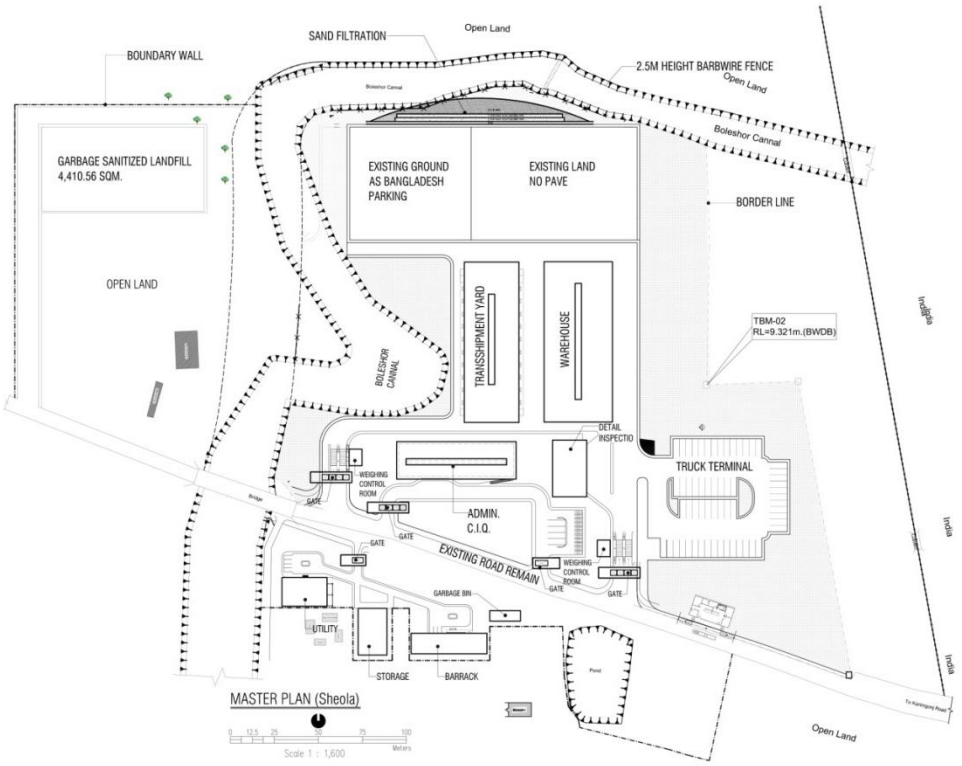
A. Phase 1

Sheola Land Port will be developed into two phases. Phase 1 development year is 2016-2019 and operational from 2010 to 2030. For phase 1, the essential facilities that needs to be operated for the land port are below. Operational Plan for the First Phase is shown in Figure 3.4.

- Administration building
- Admin(CIQ),
- Transhipment Shed 1nos
- Warehouse 1nos
- Open Stack Yard 4000 sqm
- Temporarily Bangladesh Truck Terminal
- Indian Truck Terminal
- Dormitory
- Guest House
- Substation

- Water Pump
- Awareness, warning sign and signals
- Campsite waste management
- Air, noise and water pollution management
- Equalization tank with Sand Filtration
- Temporarily Border Check post
- Fire pump and Truck Wash
- Stripping of top soil
- First Aid Box
- Sanitary Land fill
- Garbage bin
- Dust bin
- Land scaping
- Tree Plantation
- Boundary wall
- Drainage infrastructure including spill basin
- Truck wash water

Figure 3.4: Operational Plan for the First Phase



Source: Developed by the Consultants

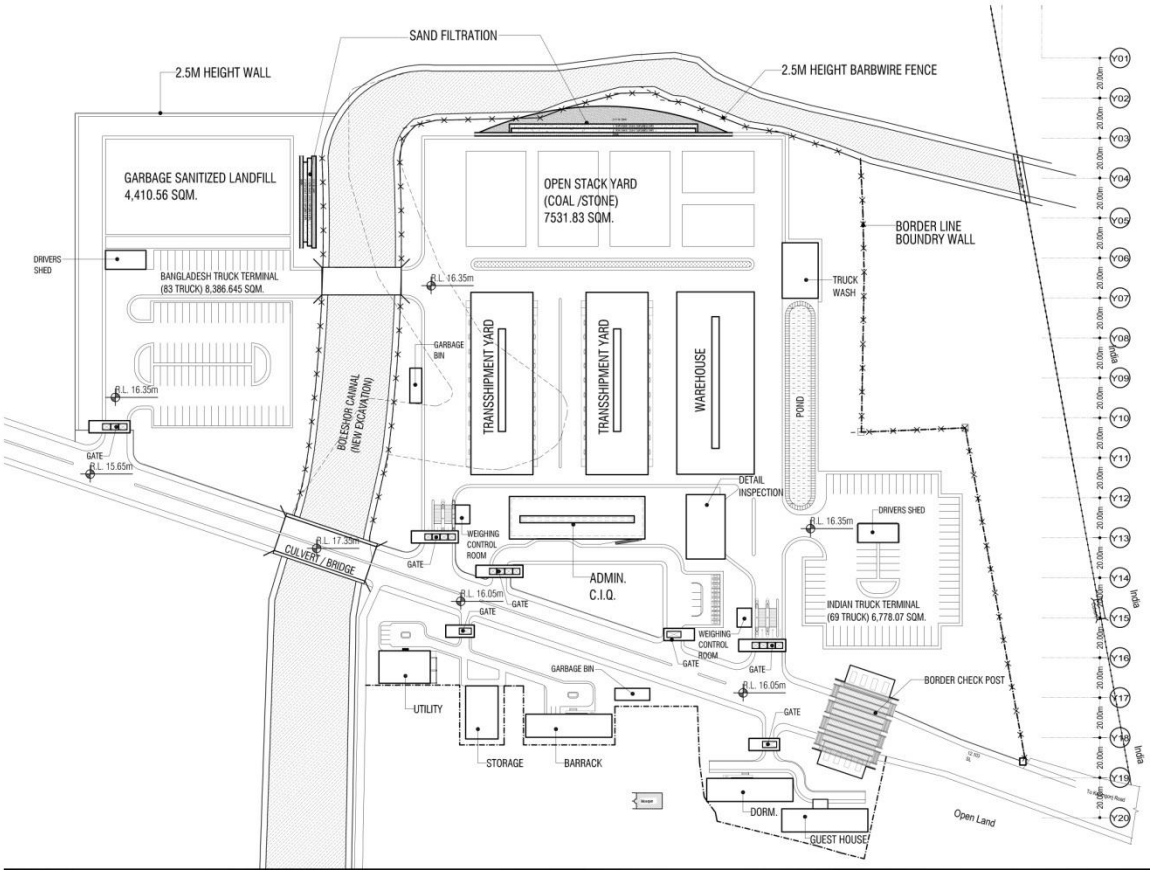
B. Phase 2

Phase 2 development year 2024-2028 and operational year is from 2030 onward. For phase 2 all facilities that need to be operated for the land port have to be build are shown in below and in Figure 3.5.

Function in Phase 2

- Transhipment Shed 1nos
- Bangladesh Truck Terminal
- Border Check Post
- Driver Dormitory
- Barrack
- Open Stack Yard Extension
- Bridge
- Road Widening
- Canal bank protection to prevent erosion of the site
- Dust management
- First Aid Box
- Tree Plantation
- Grass Plantation
- Hard landscapping
- Stripping of top soil
- Environmental monitoring (Awareness, warning sign and signal, air, noise, water and waste)

Figure 3.5: Operational Plan for the Second Phase



Source: Developed by the Consultants

3.6 Climate Change Adaptation in Project Design

The proposed site for port development is located in a floodplain land which will be submerged during rainy season. A rainwater drain is also located in the site, which also carry flood waters during rainy season. A 100 year flood level is consider for the hydrology study.

The hydrological data of Khusiara River Water Monitoring Station no SW173 collected from Bangladesh Water Development Board (BWD) for 100 years and the survey conducted by the Engineering Team. Collected data were analyzedconsidering the 100 years Return period the flood level would be 14.884 mPWD (Public Works Department). For planning and designing or establishing a project to withstand against 100 years returned period the R.L for the project should be provided at 14.884 + 1 (free board) + 0.5 (for anticipating climate change effect) =16.384 mPWD.Thus, the land will be filled up to an elevation of 16.384 mPWD equivalent to 15.87mMSL. Now consider the final design land port R.L. at 16.35 mPWD equivalent to R.L. 15.87 mMSL.

This is considered for design based on highest hydrological data. The detail of hydrology study and climate change effect is presented in **Annex 1.**

3.7 Implementing Agency and other Agencies Present at the Border

BLPA is the implementing agency of the Project and also responsible for operation of the land port facilities. In addition to BLPA, Customs and Immigration are the two major institutions that have permanent presence at these land ports. However, other administrative bodies may also operate at border crossings. These include:

- Police and other security forces, unless Customs and Immigration have the resources to ensure security within the facility.
- Border troops and security forces – these are not usually housed in the facility.
- Other agencies (e.g., agriculture, food safety, phyto-sanitary, veterinary, consumer protection agencies, etc.) which may elect to be present at the border station. This is usually the preferred solution, as the presence on site of these departments accelerates clearance and release.
- A bank branch, available to receive payments of duties.
- Clearing agents for handling imports and transit shipments.

3.8 Implementation Schedule

Development of Sheola land port is expected to take about4 years. The construction is expected to start in early 2017.

Chapter -4: Baseline Environment

4 Baseline Environment

4.1 Physical Environment

Definition of the study area or project influence area: The influence area of the overall Project is defined as areas that are likely to be directly or indirectly affected by the proposed land filling and construction activities. This includes 1 km area surrounding the proposed port facilities.

4.1.1 Physiography and land use

The general physiographic area is shown in Figure 4.1. The area is mostly plain and floodplain land. Most of the proposed area for Sheola land port is located in the catchment area of Kushiara river. The site is flooded with water during rainy season and during dry season it was used to part the trucks and temporary storage area for the imported coal. A rainwater drain flowing through the area carries the flood waters to the Kushiara river, which is located about 3km from the site. The areas south of the land port will drain to the in land drainage basin, Murihahaor, about 3km south of the site. There is an existing immigration check post at the site. Current land use of the surrounding is predominantly agricultural.

Figure 4.1: Satellite map of Sheola Land Port and the region

4.1.2 Climate

The climate of Bangladesh is sub-tropical with three seasons; namely summer from March to May, monsoon from June to October, and winter season from November to February. The average monthly temperature at Sylhet varies from 16.8°C to 29.2°C. Maximum temperature

occurs in the month of April and minimum temperature in January. Mean annual rainfall in this region is about 3,851 mm at Sylhet. About 70 percent of annual rainfall occurs during May to August. The average wind speed varies from 2.36 m/s to 3.5 m/s. Mean monthly data of temperature, rainfall, humidity and wind speed measured at the Sylhet meteorological station are given in Table 4.1, Table 4.2, Table 4.3 and Table 4.4, respectively.

Table 4.1: Monthly Temperature Data at Sylhet (degrees centigrade)

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
2005	18.1	21.7	24	26.5	25.3	28.3	28	28.1	28.7	26.8	23.2	21
2006	18.8	23.2	25.8	26.1	27.3	27.2	28.8	29.1	28.1	27.3	23.4	19.9
2007	17.6	20.5	23.8	25.4	27.7	27.3	27.6	28.5	27.9	26.3	23.7	19.3
2008	18.4	19	24	27.4	27.6	27.4	27.7	27.5	28.2	26.4	23	20.7
2009	19.3	21.9	25.1	27	27.5	27.9	28.7	28.1	28.6	26.9	23.6	19.5
2010	18.5	21	25.9	25.8	26.8	26.9	28.5	28.4	27.7	27.6	24	19.7
2011	16.8	21.3	24.5	26.7	26.9	28.1	28.1	28.1	28.5	27.5	22.6	20
2012	17.7	20.6	25.2	24.7	27.8	27.1	28.4	28.6	28.2	26.4	22.9	18.3
2013	17.3	22.2	25.9	26.8	25.9	29.2	28.5	28	28.2	26.3	22.4	19
2014	18.7	19.7	24.5	27.7	27.3	28	29.1	27.9	27.7	26.9	23.7	19.9
Mean Temp (°C)	18.12	21.11	24.87	26.41	27.01	27.74	28.34	28.23	28.18	26.84	23.25	19.73
Max Temp (°C)	19.3	23.2	25.9	27.7	27.8	29.2	29.1	29.1	28.7	27.6	24	21
Min Temp (°C)	16.8	19	23.8	24.7	25.3	26.9	27.6	27.5	27.7	26.3	22.4	18.3

Table 4.2: Monthly Rainfall Data at Sylhet (mm)

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
2005	0	48	388	296	895	354	978	626	319	259	0	0	4163
2006	0	62	16	353	572	1288	436	424	288	72	12	3	3526
2007	0	34	41	481	669	869	786	578	594	142	144	0	4338
2008	19	35	165	162	501	648	604	761	264	192	0	0	3351
2009	0	20	63	427	576	469	599	674	323	136	0	0	3287
2010	0	1	147	804	728	946	528	767	732	231	10	45	4939
2011	0	3	99	78	403	578	673	722	490	55	0	0	3101
2012	10	0	101	659	406	1185	700	738	261	502	48	0	4610
2013	0	7	16	229	959	729	567	520	347	451	0	0	3825
2014	0	34	78	118	540	724	316	797	732	33	0	0	3372
Ave.	2.9	24.4	111.4	360.7	624.9	779	618.7	660.7	435	207.3	21.4	4.8	3851.2

Table 4.3: Monthly Humidity Data at Sylhet (mm)

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
2005	74	70	75	72	81	83	85	87	81	82	75	69
2006	73	70	60	73	77	86	82	80	83	78	76	72
2007	72	69	59	76	79	86	87	84	83	80	78	77
2008	77	68	73	71	77	86	87	88	82	81	71	79
2009	74	64	59	74	78	84	83	87	82	80	76	76
2010	73	59	61	79	82	89	85	86	87	79	75	74
2011	77	64	64	69	80	85	86	85	82	77	72	75
2012	76	60	63	77	77	88	84	84	84	81	77	82
2013	74	62	60	69	83	81	83	85	83	81	74	75
2014	75	73	62	63	79	86	81	86	85	77	74	77
Ave.	74.5	65.9	63.6	72.3	79.3	85.4	84.3	85.2	83.2	79.6	74.8	75.6

Table 4.4: Monthly Wind Speed Data at Sylhet (m/h)

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
2005	2.4	2.6	3.4	3.6	3.9	3	4.3	3.6	2.9	2.5	2.3	2.5
2006	2.4	3.3	2.5	3.4	3.1	3.1	3.5	2.9	2.3	2.1	2.2	2.2
2007	2.5	4.1	6.2	3.1	3.9	2.6	3.7	2.2	2.9	2.2	3.8	2.5
2008	2.7	3.1	3	2.8	2.6	2.5	2.3	2.3	2.3	2.8	2.5	2.2
2009	2.8	5.6	2.8	2.6	2.3	2.9	3.3	3.4	2.9	2.4	2.2	2.1
2010	4.2	2.5	3.1	3.7	2.6	2.4	2.5	2.6	2	2.6	2.4	3.1
2011	2.8	2.8	3.9	3.3	3.3	2.6	3	2.8	2.6	2.1	2.2	2.4
2012	2.6	4.3	2.8	3.5	2.7	2.5	4.8	2.9	2.5	2.3	2.1	2.1
2013	4.2	2.8	2.5	3	3.2	2.8	3.2	2.6	2.7	2.4	2.3	2.2
2014	3.2	3.9	4.3	3	3.7	2.9	3.2	2.9	2.2	2.2	2.1	3.1
Ave.	2.98	3.5	3.45	3.2	3.13	2.73	3.38	2.82	2.53	2.36	2.41	2.44

4.1.3 Hydrology

The project area is located in the floodplain land. A rainwater drain, with a catchment area of about 10 sq.km is passing through the proposed land port. The location of the drain is shown in Figure 4.2. The current alignment of the drain has a bend, and erosion is noticed along the bends. The drain alignment will be straightened, as part of the port development, to reduce the erosion of the bank and to efficiently drain the flood water. The drain carries the flood waters to the Kushiara river, which is located about 3 km on the western side. On the southern side of the drain, the drainage is towards the inland Murihahaor.

Sheola is a BWDB hydrological data station on the Kushyara River and very near to the project. As such, the station represents the project. Both water level as well as discharge data has been collected from BWDB for 100 years. The collected hydrological data of Sheola on the Kushyara River has been used for the frequency analysis.

The representative water level hydrograph for Sheola on the River Kushyara developed by FFWC, BWDB for the year 2016(having highest ever recorded water level), 1988, 1998 and 2007 (three remarkable wet season). This gives an understanding of the water level profile of the River Kushyara at Sheola.Frequency analysis for extreme Water Level of Sheola has been performed using HYMOS tool a hydrological analytical tool developed by DHI, The Netherlands. Three different probability distributions (Gumbel-EV1, Log Pearson-3 and Log Normal) have been used to find the best fit one for the dataset of Kushyara River, and finally Log-Normal distribution was considered to fit the best among the three distributions. The detail of hydrology study is presented in **Annex 1.**

So, considering the 100 years Return period the flood level would be 14.884 mPWD. For planning and designing or establishing a project to withstand against 100 years returned period the R.L for the project should be provided at 14.884 + 1 (free board) + 0.5 (for anticipating climate change effect) =16.384 mPWDequivalent to 15.87mMSL. Now consider the final design land port R.L. at 16.35 mPWD equivalent to R.L. 15.87 mMSL.

The project area falls under the flash flood area of Bangladesh. The river Kushiyara flows beside the project. This river has got the dominating influence on the flood as well as drainage on and nearby areas of the project over other small channels flowing through the project. In general, if not overtopped the bank high flood bears velocity ranging from 1.25 to 2.0 m/sec. When flood water spills the bank the velocity falls as it flows all over the flood plan. As such precautionary measures to be taken for bank protection against velocity of 2 m/sec.

Figure 4.2: Rainwater Drain in the Proposed Sheola Land Port Area

4.1.4 Geology

The geology of northern Bangladesh is dominated by alluvial sediments deposited by numerous streams. The port area is underlain by thick deposits of alluvial sediments. The surface soils are usually grey silt loams and silty clay loams.

According to Bangladesh National Building Code, the Project area is located in Zone 1, which corresponds to a maximum earthquake of 6.5 g magnitude (for 2500 years return period) and an intensity of VII to VIII on the Modified Mercalli Scale. According to this code, all the buildings in this zone are to be designed for a 0.08 g magnitude seismic coefficient.

Groundwater level occurs at shallow depths of 5 to 10m and groundwater is extensively used for drinking water purposes.

4.2 Chemical Environment

4.2.1 Sampling and analysis

Sampling and analysis is carried out for air, noise and water quality. The locations of sampling sites are shown in Figure 4.3. Photographs of sampling locations are shown in Figure 4.4. The sampling was carried out in March 2016.

Figure 4.3: Locations of the Sampling Sites

Figure 4.4: Photographs of the Sampling Sites

Air Sampling

Noise Sampling

4.2.2 Ambient Air Quality

Ambient air quality in the project area is within the DOE standards. Concentrations of PM10 is about 50 µg/m^3 and suspended particulate matter is about 79 µg/m^3. The ambient air quality and the DOE standards are given in Table 4.5.

Table 4.5: Ambient Air Quality

SN	Location	Ambient Air Quality in µg/m^3					CO mg/m^3
		SPM	PM_{10}	$PM_{2.5}$	SO_2	NO_X	
01	Sheola Immigration Check Post	79.33	50.66	38.85	0.0	66.39	Nil
Duration (hrs)		8	8		8	8	1
DoE (Bangladesh) Standard (Schedule – 2)		**200**	**150**		**365**	**100**	**10**
Method of Analysis		**Gravimetric**	**Gravimetric**		**West-Geake**	**Jacob & Hochheiser**	**CO Meter**
World Bank Environmental Health and Safety Guidelines standard		**n/a**	**50**	**25**	**20 (24-hour period)**	**200 N02 (1 hour period)**	**n/a**

Legend

1. SPM Suspended Particulate Matter
2 PM_{10} Particulate Matter of a diameter of 10 micron or less
3 $PM_{2.5}$ Particulate Matter of a diameter of 2.5 micron or less
4. NO_X Oxides of Nitrogen
5. SO_2 Sulphur Di-Oxide
6 CO Carbon Monoxide

4.2.3 Noise Quality

Noise quality results are given in Table 4.6. The day time and noise time levels have exceeded the national and World Bank standards (national and WBG standards for residential areas are 45 and 55 dBA respectively).

Table 4.6: Noise Quality

SN	Location	Results in dB-A (Leq)		DoE (Bangladesh) Noise Standard for Mixed Area (Schedule-1)		WB EHS Guideline standard
		Day (6 AM-9 PM)	Night (9 PM-6 PM)	Day Time (6 AM-9 PM)	Night Time (9 PM- 6 AM)	Day and night time (for industrial area)
01	Place No 1	58.5	42.4	60	50	70
02	Place no 2	64.4	44.3	60	50	70
Method/Instrument				Sound Level Meter Model: SL - 4033SD		

4.2.4 Groundwater

In general, the groundwater is suitable for drinking purposes with a TDS of mg/l. Arsenic is not detected in the groundwater. The results of groundwater quality are given in Table 4.7

Table 4.7: Groundwater Quality

SN	Parameter	Unit	Concentration of Ground Water	Bangladesh (DoE) Standard for Ground Water (Schedule-3-B)	WHO standard (for drinking water)
01	pH		7.4	6.5 – 8.5	6.5-8.5
02	DO	mg/l	6.2	6	
03	COD	mg/l	0.0	4	
04	EC	µS/cm	268		
05	TDS	mg/l	135	1000	1000
06	Iron	mg/l	1.1	0.3-1.0	0.30
07	Arsenic	mg/l	< BDL	0.05	0.01

4.2.5 Surface Water

The surface water quality is analyzed for the nearby rainwater drain. The water contains very low total dissolved and suspended solids. The results are shown in Table 4.8.

Table 4.8: Surface Water Quality

SN	Parameter	Unit	Concentration of Surface Water	Bangladesh (DoE) Standard for Surface Water (Schedule- 3-A)	WHO standard (for drinking water)
01	pH		7.6	6.5 – 8.5	6.5-8.5
02	DO	mg/l	6.5	≥5	
03	BOD_5	mg/l	6.1	≤10	

04	COD	mg/l	26.66		
05	EC	µS/cm	55	2250	
06	TDS	mg/l	29		1000
07	TSS	mg/l	50.6		

4.2.6 Traffic

The daily traffic data at Sheola LCS on 25 April 2006 is shown in Table 4.9.About 200 vehicles per day ply along this border, on both sides.

Table 4.9: Traffic Data at Sheola LCS on April 25, 2016

Time	Truck		Pickup		Car		Microbus		CNG		Motor Cycle		Total
	Incoming	Outgoing	Incoming	Outgoing	Incoming	Outgoing	Incoming	Outgoing	Incoming	Outgoing	Incoming	Outgoing	
8.00am-9.00am	1	1	2	1	1	1	1	1	3	2	4	3	21
10.00am-11.00am	7	2	1	2	0	1	2	1	5	1	5	3	30
1.00pm-2.00pm	2	1	2	1	3	1	2	1	5	5	3	2	28
3.00pm-4.00pm	8	8	0	1	3	1	1	1	7	5	6	5	46
5.00pm-6.00pm	6	6	2	2	3	1	1	1	7	5	6	5	45
6.00pm-7.00pm	3	2	2	3	1	2	1	1	5	5	6	6	37
	27	20	9	10	11	7	8	6	32	23	30	24	207

Forecast Results for Traffic Volumes within Sheola Land Port

Forecast of traffic volumes within Sheola Land Port are estimated in Table 4.10 if all the trucks utilized for delivering export goods are coming back without carrying out anything from the land port and all the empty trucks are coming to the land port to carry out imported goods, traffic volumes on the access road will be double of the numbers above. The truck volume for both directions on the access road will be 68 trucks/hour in 2030. If a half of the truck coming in to and going out from the land port will be empty, the truck volume on the access road 51 trucks/hour. (68 – 34/2 = 51)

- This generated traffic volume, 51 trucks/hour (around 75 pcu/hour), will not impact so much when compared to the road capacity[4]. The road capacity point of view, there will not be traffic congestion on the access road if the road is improved to two lane (for both directions) road.

[4]Traffic capacity of two lanes for both directions is around 3,000 PCU/hour. Here, PCU stands for passenger car unit.

- On the other hand, traffic volumes within the land port will be 180 trucks/day in 2030 and 418 trucks/day in 2040 for both directions at the gates. If calculated in hourly traffic volume, the traffic volumes will be 32 trucks/hour in 2030 and 75 trucks/hour in 2040.

- These traffic volumes in the land port are closely related to capacities of each land port facilities, especially the gates and parking spaces.

Table 4.10 Forecast Results for Traffic Volumes within Sheola Land Port

Items		Unit	2016	2020	2025	2030	2035	2040
Export		1,000 ton	43	67	141	263	434	668
Import		1,000 ton	131	228	443	785	1,215	1,716
Total		1,000 ton	174	295	584	1,048	1,649	2,384
Truck numbers in Sheola land port (used for planning & Design : **land port**)	Export	Trucks/year	4,324	6,662	14,074	26,326	43,396	66,762
	Import	Trucks/year	6,553	11,410	22,153	39,246	60,754	85,814
	Total	Trucks/year	10,877	18,071	36,228	65,572	104,150	152,577
	Export	Trucks/day	12	18	39	72	119	183
	Import	Trucks/day	18	31	61	108	166	235
	Total	Trucks/day	30	50	99	180	285	418
	Export	Trucks/hour	2	3	7	13	21	33
	Import	Trucks/hour	3	6	11	19	30	42
	Total	Trucks/hour	5	9	18	32	51	75

Note: Deployed calculation values for planning & design of land port facilities are:
-Trucks for export = 10 ton/vehicle, Trucks for import = 20 ton/vehicle
- Hourly traffic volume ~ 18% of daily traffic volume in consideration of port operation hours

4.3 Biological Environment

4.3.1 General Biodiversity

The biodiversity in the project area is influenced by human activities and most of the current land use is agriculture with cultivated paddies and grasses. The project area is a floodplain land and hence is habitat of fish species during rainy season. The Murihahaor which is located about 3 km downstream of the proposed land port site is an inland drainage basin and can be considered as a good fish habitat. No flora and fauna species of red listed status are located in the project area.

4.3.2 Flora

The project area and surrounding areas consist of different fruit and fuel wood trees. Among the trees, the most widely available ones are Shal, Shilkoroi, Mehagani, Eucalyptus, etc. Also, there are some fruit trees such as Mango, Coconut, Jackfruit, Battle nut, guava, etc. The shrub consists of species like Leeacrispa, Glycosmisarborea, Thespesialampa, and Urenalobata. It also has climbers such as *Mucunapruriens*, *Fucusscandens, Pothasscandens*, and *Smilax*

macrophilia, and herbs like *Ageratumconicoid*'s, Desmodiumgangeticum, Cleome viscose, and Clerodendrumviscosum.

4.3.3 Fauna

The fauna species reported in the project area and surroundings are given in Table 4.11. Small Asian mongoose (Herpestesauropunctatus) is vulnerable species, and though there is no suitable habitat for this species in the project area, it was reported to visit the project area.

Table 4.11: List of Fauna species reported in the Project area

Mammals			
Local name	**Scientific name**	**Habitat**	**IUCN Status**
Chicka (house shrew)	*Suncusmurinus*	paddy field	Not threatened
Benji (mongoose)	*Herpestesauropunctatus*	Bush	Vulnerable
Avian fauna			
Ghugu	*Streptopeliaorientalis*	Tree branches	Vulnerable
Kak	*Corvussplendens*	Tree branches/ Bush	Not threatened
Myna	*Sturnus contra*	Tree branches/ Bush	Not threatened
Bhatshalik	*Acridotherestristis*	Tree branches/ Bush	Not threatened
Reptiles			
Raktochosha	*Calotesversicolor*	Bush	Not threatened
Amphibians			
Kuno bang	*Bufomelanostictus*	House corner/ damp places	Not threatened

4.3.4 Fishes

The common fish species in the project area in the flood plains, haors, rain water drain and Kushiara river are catfishes (Magur and Shing), major carps (Katla, Rui, and Mrigal), minor carps (Puti), Tilapia, other (Tengra, Boal, Mola, Taki, Shol). No aquatic species of conservation importance are recorded in the Kushiara river. Commercially valuable fish species such as hilsa has also not been found in the Kushiara river.

4.4 Brief Socio-Economic Baseline.

4.4.1 Population and Demography

The proposed land port is located inDubhag Union of BeanibazarUpazila. According to government statistics, total Population-22,203; Male population is 10,746, Female population is 11,457; Total Household is 3, 619; Literacy- 53.9%, male-55.4% and female-52.6%, Family size of the is 6.1. 88% people are Muslims and remaining are mostly Hindus. No indigenous people are located in and around the project area.

4.4.2 Income and Occupation

The Socio- Economic condition of the project area is given below. The project area has diversified character and income level.

Main crops are Paddy, pulses and winter vegetables and Boroare the main rice varieties. So, other than agriculture, farm laboring most depends on the business. Around the project site around 75% households rely on the firm.

Main fruits are Jackfruit, orange, litchi, guava, satkora, etc

Fisheries, dairies, and poultries This Upazila has some fishing, dairies, and poultries.

The area is mainly remittance earning zone. A good number of the people are living in the abroad, especially in Britain. So, rich people are accustomed to western living standard. Though the fact, ordinary citizens are very conservative in belief.

Main sources of income Agriculture 26.39%, non-agricultural laborer 6.80%, industry 0.78%, commerce 12.20%, transport and communication 3.09%, service 4.16%, construction 3.74%, religious service 0.51%, rent and remittance 28.37% and others 13.96%.

4.4.3 Literacy

The rate of education and significant educational in the Beanibazar

Upazila are as follows. Literacy rate and educational institutions Average literacy 52.52%; male 55.60%, female 49.60%. Educational institutions: college 4, secondary school 34, primary school 134, community school 6, kindergarten 4, madrasa 345. Noted educational institutions: Lauta High School (1871), PanchakandhaHargovinda High School (1917), Khasa Government Primary School (1895), Jaldhup Government Primary School (1909). (Source: Banglapedia).

4.4.4 Health Facilities and Sanitation

In BeanibazarUpazila people mainly depend on government hospital. Some charity health clinics with limited facilities are available in the Upazila. Typicalhealthservices are available in the hospital and no specialized doctors and facilities. No significant and critical treatment are available there. The local people urged the plant authority should have supported or built a hospital with modern health facilities.

Sources of drinking water Tube-well 79.79%, tap 2.37%, pond 13.28%, and others 3.70%.

Sanitation 60.46% (urban 74.46% and rural 59.13%) of dwelling households of the Upazila use sanitary latrines, and 36.08% (urban 24.41% and rural 37.19%) of dwelling houses use non-sanitary latrines; 3.45% of households do not have latrine facilities.' (Source: Banglapedia)

Sanitation facilities in the area are medium. At the project site 60% households are using sanitary latrines, 20% kutcha latrine and 20% household have pucca latrine but not these always sterile (Source: Public consultation and FGD meeting).

Number of affected person with title holder is shown in Table 4.12 and non-titleholder is shown in 4.13.

Table 4.12: List of Title Affected Person

Sl. No.	Name of the Project Affected Person's (PAP's)	Category	Area (ft x ft) of Structure (Sft.)		Type of Structure
1	Md. Abul Khair	Title holder- Commercial	15ftx12ft	180	Semi Paca
2	Mohir Uddin	Title holder- Commercial	10ftx8ft	80	Semi Paca
3	Gias Uddin Hira	Title holder- Commercial	30ftx14ft	420	Semi Paca
4	Jalal Uddin	Title holder- Commercial	30ftx14ft	420	Semi Paca
5	Jamir Ali	Title holder- Commercial	35ftx15ft	525	1-storied Building
6	Syed Mosadek Ali	Title holder- Commercial	71ft x17ft x2	2414	2-storied Building
7	Fayez Ahmed	Title holder- Commercial	36ftx18ft	648	2-storied Building
			24ftx16ft	384	1-Storied Building
		Title holder-Agricultural			
8	Abdur Razzak	Land loser & Structure	75ftx40ft	3000	1-Storied Building
9	Abdul Karim	Land loser & Structure	95ftx65ft	3175	Semi Paca
10	Salim Uddin Pervez	Title holder- Commercial	30ftx15ft	450	Semi Paca
			30ftx18ft	540	Semi Paca
			30ftx13ft	390	Semi Paca
11	MA Hashem	Title holder- Commercial	25ft×20ft	500	1-Storied Building
			75 ftx30ft	2250	Semi Paca
			75 ftx22ft	1650	1-Storied Building
12	Md. Ramiz Ali,	Title holder- Commercial	30ftx13ft	450	Semi Paca
13	Abdul Kuddus	Title holder- Commercial	20ftx8ft	160	Tin shed shop
14	Abdur Rahim	Title holder- Commercial	10ftx8 ft	80	Tin shed, tea stall
15	Mahtab Uddin	Title holder- Commercial	10ftx7ft	70	Tin shed shop
16	Abul Basit	Title holder- Commercial	18ft x12ft	216	Semi pacca
17	Amir Ali	Title holder- Commercial	10ftx10ft	100	Tin shed shop
18	Idris Ali	Title holder- Commercial	12ft x 8 ft	96	Tin shed shop
19	Abdul Quium	Title holder- Commercial	10ftx 8ft	80	Tin shed shop
20	Hazi Abdus salam	Title holder- Commercial	20ftx10ft	200	1-Storied Bld.
21	Islam Uddin	Title holder- Commercial	20ftx14ft	280	Tin shed shop
22	Hazi Md. Abdus Salam	Title holder			
23	Munir Uddin,	Title holder			
24	Nazrul Islam	Title holder			
25	Hira Gong	Title holder			
26	SelimParvez	Title holder			
27	Alauddin	Title holder			
28	Amiruddin	Title holder			
29	Majir Uddin	Title holder			
30	Azim Uddin	Title holder			
31	Moktadir and his brothers	Title holder			
32	MoynulHoq	Title holder			
33	Maruf Ahmed	Title holder			

Sl. No.	Name of the Project Affected Person	Category	Area (ft x ft) of Structure		Type of Structure
34	Foyez Ahmed	Title holder			
35	Mashuk Ahmed	Title holder			
36	Fakaruddin	Title holder			

Table 4.13: Non-title affected 12 Persons

	Name of Tenant and Employee	Category
1	Swapon Das	Tenant of SelimParvez- Commercial
	Joy Das	Employee
	Hossain	Employee
2	Nayan Pal	Tenant of Abdul Karim- Commercial
	Rawshan Mia	Employee
	Uttam Pal	Employee
	Chan Pal	Employee
	Sagar Pal	Employee
3	Kazol Pal	Tenant of Hira Gang -Commercial
	Shankar Das	Employee
	Midhu Pal	Employee
4	Md. Azad	Tenant of Idris Ali- Commercial

Chapter -5: Potential Impacts and Mitigation Measures

5 Potential Impacts and Mitigation Measures

An environmental screening checklist[5] was used to assess the potential environmental issues in construction and operation of the proposed subproject. The screening checklist is given in Annex 2.Sheola Land Port will be developed into two phases. Phase 1 development year is 2016-2019 and operational from 2010 to 2030 and Phase 2 development year 2027-2029 and operational year is from 2030 to 2040. Major work will be done in Phase 1 and rest of the work will be done in Phase 2. General mitigation measures and best management practices to address the construction related impacts are given in Annex 3 Environmental Code of Practices (ECoPs) which are prepared based on World Bank General EHS guidelines and experiences from other projects in Bangladesh. By inclusion by these ECoPs in general specifications of contractors bidding documents, most of the construction related impacts can be mitigated.

5.1 Impact Assessment Methodology

Potential environmental and social impacts were identifiedby a review of feasibility study reports, field visits, and stakeholder consultations. The significance of potential impacts was assessed using the criteria and methodology given below.

Impact Magnitude

The potential implications of the project have been categorized as major, moderate, minor or nominal based on consideration of the parameters such asi) duration of the effect; ii) spatial extent of the impact; iii) reversibility; iv) likelihood; and v) legal standards and established professional criteria.

The magnitude of potential impacts of the Project has been identified according to the categories outlined in **Table 5.1**

Table 5.1: Parameters for Determining Magnitude

Parameter	Major	Moderate	Minor	Minimal
Duration of potential impact	Long term (beyond the project period)	Medium Term Lifespan of the project (within the project period)	Limited to construction period	Temporary with no detectable potential impact
Spatial extent of the potential impact	Widespread far beyond project boundaries	Beyond next project components, site boundaries or local area	Within project boundary	Specific location within project component or site boundaries with no detectable potential impact
Reversibility of potential impacts	Potential impact is effectively permanent, requiring considerable intervention to return to baseline	Benchmarkneeds a year or so with some responsesto come back to baseline	Baseline returns naturally or with limited response within a few months	Baseline remains constant
Legal standards	Breaches national	Complies with limits	Meets	Not applicable

[5]The screening checklist is developed by European Commission and is available at http://ec.europa.eu/environment/archives/eia/eia-guidelines/g-screening-full-text.pdf

Parameter	Major	Moderate	Minor	Minimal
and established professional criteria	standards and or international guidelines/obligations	given in national standards but violates international lender guidelines in one or more parameters	minimum national standard limits or international guidelines	
Likelihood of potential impacts occurring	Occurs under typical operating or construction conditions (Certain)	Happens under worst case (negative consequences) or best case (positive impact) working conditions (Likely)	Occurs under abnormal, exceptional or emergency conditions (occasional)	Unlikely to happen

Sensitivity of Receptor

The sensitivity of a receptor has been determined based on a review of the population (including proximity/numbers/vulnerability) and the presence of features on the site or the surrounding area. Each detailed assessment has defined sensitivity about the topic. Criteria for determining receptor sensitivity of the Project's potential impacts are outlined in **Table 5.2.**

Table 5.2: Criteria for Determining Sensitivity

Sensitivity Determination	Definition
Very High	Vulnerable receptor with little or no ability to absorb proposed changes or minimal opportunities for mitigation.
High	Vulnerable receptor with little or no ability to absorb proposed changes or limited opportunities for mitigation.
Medium	Vulnerable receptor with some ability to absorb proposed changes or moderate opportunities for mitigation
Low	Vulnerable receptor with good ability to absorb proposed changes or/and excellent opportunities for mitigation

Assigning Significance

Following the assessment of magnitude, the quality and sensitivity of the receiving environment or potential receptor has been determined and the significance of each potential impact established using the impact significance matrix shown in Table 5.3.

Table 5.3: Significance of Impact Criteria.

Magnitude of Impact	Sensitivity of Receptors			
	Very High	High	Medium	Low
Major	Critical	Major	Moderate	Minimal
Moderate	Major	Major	Moderate	Minimal
Minor	Moderate	Moderate	Minor	Minimal
Minimal	Minimal	Minimal	Minimal	Minimal

Summary of Assessed Impacts

The project's potential impacts and their significance have been assessed using the methodology described in the above section. A summary of these results and their significance is presented in **Table 5.4.**

Table 5.4: Potential impacts and their significance.

Impact of various activities	Sensitivity	Magnitude	Significance before Mitigation	Mitigation and Enhancement Measure	Residual Significance
Impacts from Siting – Environmental					
Land use change	Medium	Major	Moderate	Landscaping and green area development; buffer zone; lot of facilities for pedestrians,	Minimal
Impact on tree cutting	Medium	Moderate	Moderate	Planting of 400 trees (200 ornamental trees, 200 wood trees)	High (positive)

Impact on hydrology floodplain habitat	Low	Moderate	Minimal	Drainage facilities	Minimal
Impact from realignment of drain (drainage canal)	Low	Moderate	Minimal	Improvements in the canal drainage and flood flows, control of ongoing erosion,	High (positive)
Impacts of flooding on the proposed port	High	Major	Major	Land development over a 100 year a flood level, 1 m above the flood level for any possible climate change and other uncertainties	Minimal
Impacts from widening of access roads	High	Major	Major	Compensation for the loss of trees	Minimal
Impacts from Siting – Social					
Land Acquisition and Resettlement	High	Major	Major	Compensation for land, structures and trees as per RAP	Minor
Impact on businesses	High	Major	Major	Compensation and livelihood assistance as per RAP	Minor
Impacts from Construction – Environmental					
Disposal of contaminated soils	Medium	Moderate	Moderate	Transport to the nearest brick industries for their use in kilns	Minimal
Impacts from land filling	Medium	Moderate	Moderate	Proper compaction and adequate drainage facilities	Minimal
Impact on borrow areas	Medium	Moderate	Moderate	Avoid agricultural land and environmentally sensitive habitats such as beels and hoars Carry out excavation activities as per environmental code of practices (EcoP) on borrow/quarry area management	Minimal
Air quality impacts	Medium	Moderate	Moderate	Maintenance of construction equipment and vehicles; and implementation of ECoP on air quality management	Minimal
Solid waste generation and disposal	Medium	Moderate	Moderate	Proper collection and disposal of solid waste	Minimal
Impacts from Construction – Social					
Impact on local traffic	Medium	Moderate	Moderate	Traffic management plan	Minimal

Community healthand safety	Medium	Moderate	Moderate	Noise and dust control measures in accordance with ECoPs on noise and air quality management	Minimal
Workers health and safety	Medium	Moderate	Moderate	Occupational health and safety of construction workers	Minimal
Employment opportunities for local communities	Medium	Moderate	Moderate (positive)	Preference to the local communities in the construction works	Moderate (positive)
Impacts from O&M – Environmental					
Unregulated development	High	Major	Major	Land use zoning by the local government (Dubagh Union Parishad with the support of BeanibazarUpaZilaParishad)	Minimal
Storm water drainage and sewerage facilities	Medium	Major	Moderate	Storm water drainage facilities and septic tanks are included in the project design.	Minimal
Impact on soil and groundwater quality	Medium	Major	Moderate	Sand filters from the drainage of open stack yards. Emergency response mechanism in case of oil spills.	Minimal
Impact on air quality	Medium	Major	Moderate	Maintenance of equipment of trucks; pavement of sidewalks, coal open stack yard, and buffer areas are included in the project design	Minimal
Impacts on coal wash water	High	Major	Major	Treatment of coal wash water through neutralization tank is included in the project design	Minimal
Solid waste	Medium	Major	Moderate	Regular solid waste collection and disposal	Minimal
Cumulative impacts	Medium	Major	Moderate	Development of EMPs during design of the projects	Minimal
Impacts from O&M – Social					
Positive socio-economic impacts	High	Major	Major (positive)	No mitigation or enhancement measures	Major (positive)
Community health and safety (traffic safety, noise, dust)	High	Major	Major	Dust control measures through regular sweeping of access roads	Minimal
Workers health and safety	High	Major	Major	Personal protective equipment, maintenance of drinking water and sanitation facilities; regular sweeping of road dust	Minimal

5.2 Environmental Impacts from Project Sitting

5.2.1 Land use change

The subproject area is located in a rural setting, though some amount of trade is in place through Sheola land port. The proposed land port development will change the natural setting of greenery in the project area. The rural communities are exposed to heavy traffic due to port development. The land use in the nearby vicinity of the land port will also change in to commercial areas. There may be accidental discovery of any archaeological, paleontological, historical or cultural artifact in the course of excavation or construction works associated with the project.

Mitigation

Landscaping and plantation development is proposed within and around the port facilities. About 3 m of buffer zone with plantation is proposed in the design of the project facilities. The green area is shown in Figure 5.1. In addition, there will be adequate facilities such as water and sanitation, restrooms, dormitory, restaurant, mosque. There will be facilities for pedestrians.

In case of accidental discovery of any archaeological, paleontological, historical or cultural artifact in the course of excavation or construction works associated with the project. Contractors to follow the chance find procedures in the EMP table and Annex 4.

Figure 5.1: Landscaping and greenery in the proposed land port

5.2.2 Impact on tree cutting

Five wood trees will be cut from the project site. To compensate the tree loss and to develop, greenery in the project area about 200 wood trees (Debdaru) and 200 ornamental trees (Radhachura and Krishnochura) will be planted around the land port facilities. The plantation development has included in the contractors work item.

5.2.3 Impact on Hydrology and floodplain habitat

The project area is located in a floodplain land. The development of the proposed land port area about the flood level may have impact on the local flood plain hydrology. However, the impact is expected not to be significant since the overall drainage area of the land port site is more than 10 sq.km and proposed land port will be less than 0.1 percent of this drainage area. There is a haor (an inland drainage basin) on the southern side of the land port. The storm water drainage from the port facilities if diverted to this haor will have an impact on the fish habitat on the haor.

Mitigation

- Storm water facilities have been designed to divert all the rainwater from the port facilities to the nearby storm, which will finally join to the Kushiara river.A spill basin should be constructed to remove the dirt, silt and other material in the storm water before discharge to the canal.

5.2.4 Impact from realignment of drain (drainage canal)

The impact from realignment of canal is mostly positive due to control of ongoing erosion at the channel bend, and efficient channeling of flood water to the downstream.The existing channel of the site has very little trace of water, but it is submerged during monsoon. We propose to re direct the sharp curvature of this inactive channel and ensure the smooth flow during the monsoon. Further, bank protection measures are also included in the project design. Storm water drainage for the port facilities will also be diverted to this drain.

5.2.5 Impacts of flooding on the proposed port

The proposed land port is located in a floodplain area and will be submerged under water during rainy season. If the port facilities are not built above the maximum flood levels, there is a risk that the port facilities will be flooded during monsoon. There is also a risk of flooding from the rainwater drain located in the project site.

Mitigation

Port facilities have been designed considering a 100-year flood level. Further, a 1.5 m of additional flood level has been considered for the project design to accommodate the climate change and other uncertainties.

5.2.6 Impacts from widening of access roads

The road connectivity from Sylhet to the proposed land port need to be strengthened and widened. The widening of this road will have land acquisition and resettlement impacts, and construction related impacts on local communities. However, no forests or ecologically sensitive areas are located along this connecting road.

Mitigation

Environmental assessment studies will be carried out during design of this connectivity road in accordance with the EMF and RPF that were prepared for the overall Project.

5.2.7 Impacts from Land Acquisition and Structure Remove

For the proposed land port total 22.1 acre of land main low and partly high land will be required and existing 22 structure need to be removed. A total of 49 persons will be affected out of this 4 persons is non-title affected and 8 persons are employees will be affected.

Mitigation

Proper compensation will be provided by the project authority. Primary compensation for land and structure should be provided by DC, salvage material will be taken by owner as norms and common practice, additional grant by Project, Transfer Grant (TG) by Project (5% on market price) and construction grant by project (about 10% on market price). For livelihood loss allocation of income generation, Livelihood compensation for 6 months subsistence allowance, Shifting allowance and rental allowance for 6 Months should be provided. Employee will get only livelihood compensation for 6 months.

5.3 Environmental Impacts from Construction

5.3.1 Disposal of contaminated soils

Some of the proposed areas for land port development are currently under use of coal storage during dry season. Since coal is the major import from the current Sheola LCS, huge volumes of coal are being deposited in these areas. The surface soil near the coal deposits is contaminated with coal dust. The coal that is generally imported from northeastern India consists of high sulfur and generally used for brick kilns. Hence the top soil exposed to coal and coal dust may contaminated with Sulphur.

Mitigation

The surface soil exposed to coal dust will be collected and disposed appropriately. The quantity of contaminated soil is expected to be insignificant, and groundwater samples did not show any sign of contamination from coal; nonetheless During the mobilization phase a more detailed soil investigation should be conducted to figure out the scale and significance of the soil contamination and propose a detailed disposal option. Disposal through burying, if selected, shall ensure that contaminated soils do not create a risk of future groundwater contamination

5.3.2 Impacts from land filling

The proposed land port will be filled with the borrow material for raising it above the designed flood level. The drainage coming from the land filling activities will contain high turbidity levels and will pollute the nearby lands.

Mitigation

The drainage from the borrow material will be contained through systematic filling of land through compartments and allowing the water to stay for longer time in those compartments to allow the sediments to settle. The drainage water from the land filling activities will be diverted to the nearby rainwater drainage canal.

5.3.3 Impact on borrow areas

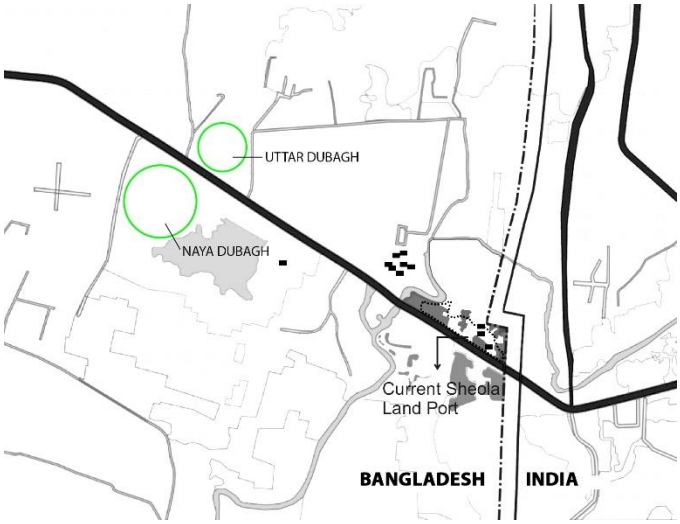
About 327,452.88 cubic meters of borrow material will be required both for phase 1 (206,460.6 cum) and Phase 2 (120,992.28 cum) period filling of the proposed land port site. Another about 20 acres of land would be required for the fill material is to be sourced from the abandon fallow land (assuming 3.66 m depth of excavation). The collection of filled material will cause no impact on the hydrology and aquatic habitat of the adjacent areas.

Mitigation

Filled material management plan is prepared to mitigate the impacts related to various activities to be carried out in the soil collection process, such as excavation, lifting and transportation. Fill the land in dry season. If transported by truck then cover the soil by tipple of the truck during transportation. Spray of water is suggested in the construction sites. The location of borrow land is primarily identified Naya Dubagh,

Uttar Dubagh, and un-utilized, nonagricultural land nearby Dubagh area. There will no potential socioeconomic / livelihood impacts which need to be addressed.Location of the land fill source material is about 3 km and is shown in Figure 5.2.

Figure 5.2. Location of the Land Fill Source Material



5.3.4 Air and Noise impacts

Air pollution may be caused by emissions from construction related traffic and machinery. A lot of noise and dust will be produced by earth works at river training works, other machinery, concrete mixing, and traffic from trucks and vehicles. Noise levels at nearby villages may exceed the national standards.

Mitigation

The following mitigation measures will be implemented:

Density and height thickness of plantation should be provided 30-40 ft height and density 15 ft.Interval of 15-foot supplement with small trees and shrubs so that noise and dust control will improve.

-
- Construction equipment and vehicles will be well maintained, so that emissions are minimal and comply with emission standards.
- Dust generation from construction sites will be restricted as much as possible and water sprinkling will be carried out as appropriate, especially at those places where earthmoving, excavation and blasting will be carried out.
- Air quality will be properly monitored, especially near the villages close to the construction areas.
- Contractor will be required to implement the measures prescribed in the Environmental Code of Practices (ECoPs), which will be included in the contracts. ECoPs 10 and 11 cover Air Quality and Noise Management
- Construction activities near the settlements will be limited to day time only. High noise producing equipment will be provided with mufflers or acoustic enclosures.

5.3.5 Solid waste generation and disposal

Construction works will generate large quantities of excess materials from construction sites (concrete, discarded material) and wastes from workers' camp and construction yards, including garbage, recyclable waste, food waste, and other debris without hazardous contamination.

Mitigation

The following mitigation measures will be implemented:

- Contractor will prepare and implement solid waste collection and disposal plan
- The contractor will identify suitable sites for disposal of hazardous and non-hazardous waste. The selection will be done in consultation with the local Union Parishad and Upazila authorities.
- The contractor will use the debris generated from the dismantling of existing buildings for slope protection of the filled land if suitable.
- Protocols and measures prescribed in the ECoPs (Annex 3) on the management of solid and hazardous waste will be implemented.
- Sitting of any fuel and hazardous material storage sites, including refuelling facilities, batching plants and construction yards are to be located at least 500 m away from any residential areas.

5.3.6 Associate activities (Power line, Road widening)

Port's operation will require a 13km extension of an existing 3200 KVA power line from Beanibazar to the land port which may impact during construction period.

Mitigation:

This will be extended over the existing line along the road side. No replacement or any pole. Hence there is no Impact of electromagnetic radiation, crop loss and tree cutting. Only during extension work safety measure will require. Road widening will require after 5 years

5.4 Impacts from Construction – Social

5.4.1 Community health and safety

The construction activities can potentially impact the residents of the nearby villages, particularly the movement and safety of school children. The increased use of trucks and other vehicles on local roads may increase risk of traffic accidents on pedestrians, particularly elderly people and children.

Mitigation

The following mitigation measures will be implemented:

- Contractor will develop a traffic management plan in compliance with ECoP on traffic management
- The Traffic Management Plan will be implemented with aim at ensuring access to residential areas, and preventing unsafe situations, especially near schools, housing areas, construction areas, camps and office.
- Ensure that all construction vehicles observe speed limits on the construction sites and on public roads
- Provide adequate signage, barriers, and flag persons for traffic control.
- Fit audible warning devices in vehicles to alert during reversing

5.4.2 Workers health and safety

Construction activities also pose safety hazards for the contractors' staff and also staff working in the Land Customs and Immigration offices.

Mitigation

The following mitigation measures will be implemented:

- Occupational health and safety procedures will be enforced at site. Each contractor will be required to prepare, obtain approval of, and implement an occupational health and safety (OHS) plan. These plans will be prepared in compliance with the ECoPs (Annex 3) and World Bank Group's Environment, Health, and Safety (EHS) Guidelines[6].
- Road signage will be fixed at appropriate locations to reduce safety hazard associated with project-related vehicular traffic.
- Vehicle speeds near / within the communities will be kept low, to avoid safety hazards.
- For school going children near the road crossing point the vehicle speed need to be reduces and wait till the children cross the road.

5.4.3 Employment opportunities for local communities

About 200 skilled and non-skilled workers will be required during construction on continuous basis for about 2 years. The project offers good opportunities for local residents to apply for employment as unskilled and skilled construction workers. Contractor will be recommended to employ local workers and technicians to the extent possible. All these new opportunities for work for local residents could boost employment and improve the social and economic position of the population. This will be a major and significant positive impact of the project.

5.5 Impacts from O&M – Environmental

5.5.1 Unregulated development

Based on the experience of other land ports in Bangladesh, it is expected that the nearby areas of port will be developed both commercially and residentially. If these developments are not regulated, there will be significant impacts on the local community health and safety.

Mitigation

As a part of the engineering designs, a long term master plan should be developed for planning of land port facilities with adequate buffer areas around the port facilities. In addition, the project will support creation and/or updating of land use plans around the port areas during project implementation, to help address challenges related to unregulated but anticipated development around the port facilities that falls outside the scope of the land port's jurisdiction and immediate buffer zone.

[6] Download EHS Guidelines: http://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final+-+General+EHS+Guidelines.pdf?MOD=AJPERES

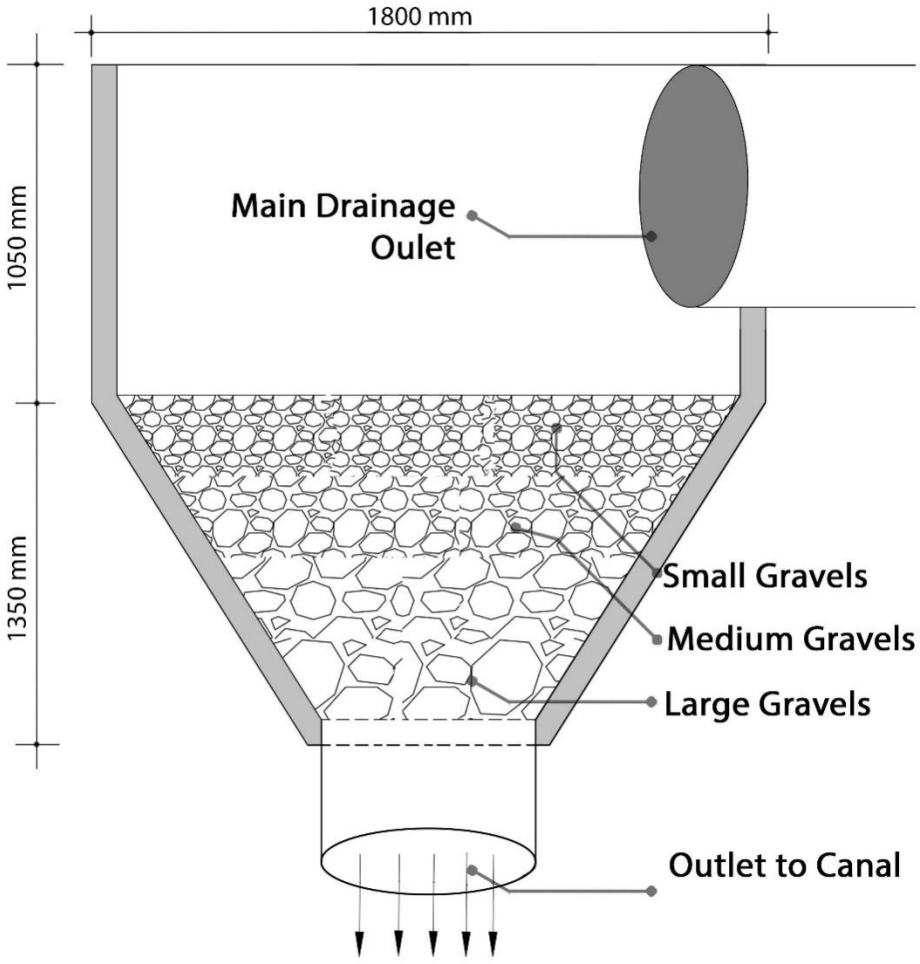
5.5.2 Storm water drainage facilities

The storm water runoff from the port facilities may carry dirt and contaminants. If it is carried to the surface water resources through drains, it will have impact on the quality of aquatic habitat.

Mitigation

- Storm water drains have been designed in the project design. The drainage facilities will be regularly maintained for their effective use. A spill basin should be constructed to remove the dirt, grit, silt and other material in the storm water before discharge to the canal. The drawing of the spill basin is shown in Figure 5.3.

Figure 5.3: Spill Basin for Storm Grit Removal System



5.5.3 Impact on soil and groundwater quality

The dust from the loose materials and open stack yards, particularly from the coal storage areas are expected to pollute the soil resources; and storm water runoff from these facilities will also contaminate the groundwater and surface water resources.

Mitigation

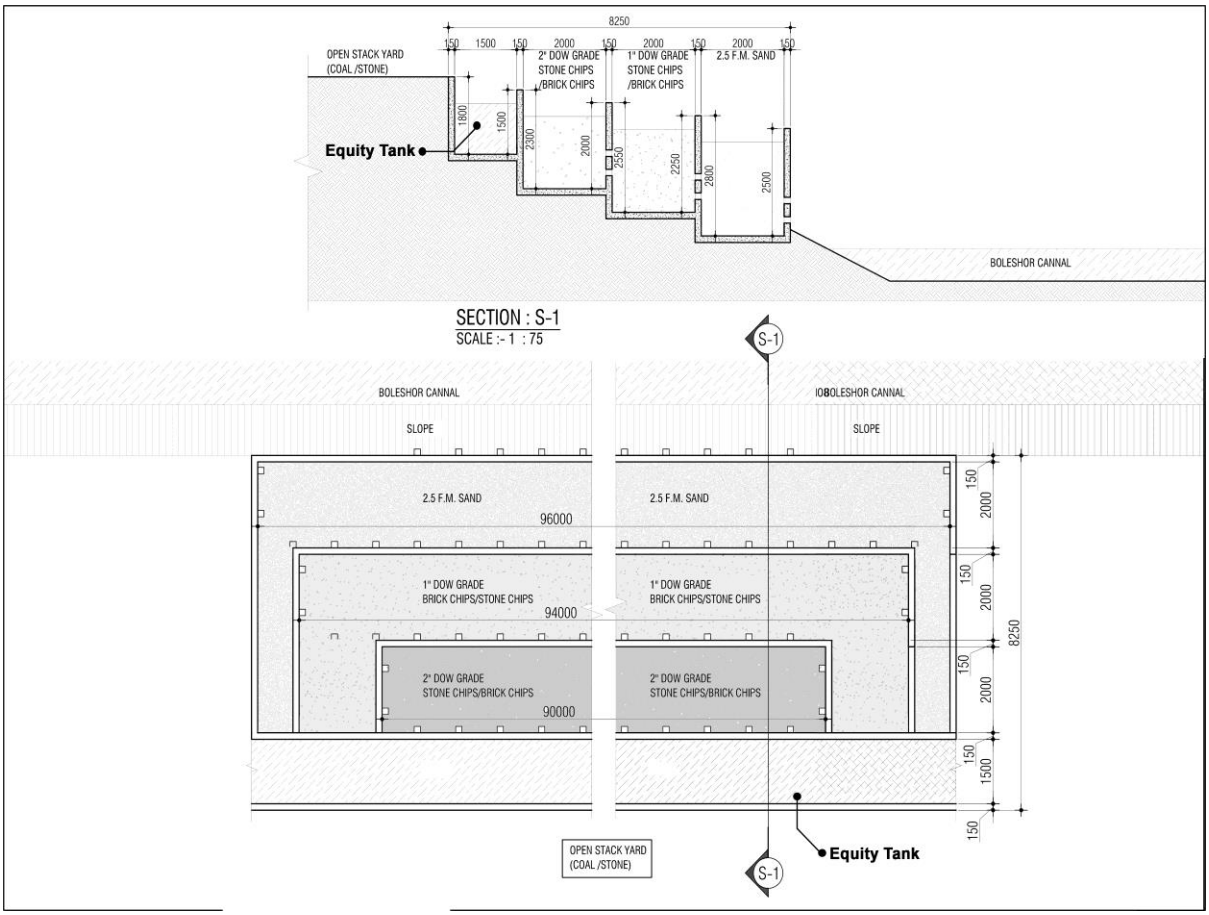
Entire Open stack yards will be concrete paved and covered the coal with plastic sheets during monsoon season. This impermeable pavement will protect the risk of groundwater and soil contamination. The storm water drainage from the open stack yards will be allowed to settle in the settling pond and then will be filtered through multi-grade sand filters. Settling pond and sand filtration has been designed near the open stack yards. The filters will be regularly cleaned and maintained.

5.5.4 Impact on Coal wastewater treatment

During rain open stack yard coal will washed out with coal dust pollution which may pollute surface and ground water. Low grade coal having sulphur content which may produce acidic wastewater and created the surface water acidic. During high wind blow will also coal dust will create problem in the surrounding area a mainly north side.

Mitigation

Coal wash water will be collected in an equalization tank. If the coal wash water will be acidic then it should be neutralized with alkali before filtration and discharge. After sedimentation the coal dust with retain in the drain through grit removal then neutralize the coal wash water in equalization tank (90mx2mx1.5m) followed by pass through multi-grade bed filter (90mx6mx6m) and the filtrate discharge to the Boleshor canal after comply the DoE standard. Continuous monitoring will also be carried out to check the pH level before discharge.



5.5.5 Impact on air quality

Transshipment yards, coal storage at site, access roads and traffic are the major sources of dust pollution. Storage and handling of coal is also a major source of dust pollution.

Mitigation

Dust control measures have been considered during design of the proposed facilities. All the potential sources of dust such as access roads, transshipment yards will be paved. Dust suppression will be regularly carried out through water sprays or sweeping/vacuum collecting equipment, etc. Coal dust will be mitigated through application of water sprays during handling. The loose material stored in the open stack yards will be covered with plastic sheets. Plantation around the boundary walls of the port facilities is also expected to reduce the dust pollution on the nearby communities.

5.5.6 Impact on odor quality

Odor from diesel exhaust emitted by land-based equipment and vessels and vapors from transfer of liquid bulk products.

Mitigation

“Diesel Engines” and “Liquid Bulk Storage and Transfer (Loading/Unloading)” for BMPs. Adopt a policy requiring port/tenant employees to report odors they detect to a port manager (odors detected on port/tenant property will be detected on adjacent property)

5.5.7 Impact on Trash

Trash from port/tenant activities “deposited” outside port/tenant property by visitors, service providers, employees, others;

Mitigation

Conduct a reduce/recycle/reuse (waste minimization) study to identify sources of current waste streams and alternatives to disposal; include a perimeter (and beyond) survey of trash to identify its origins;
Place marked trash containers at locations convenient to visitors, truck operators and employees; Cover and berm trash collection areas and containers (e.g., roll-offs, barrels) to avoid dispersion by wind and storm water; Ensure proper management of waste, if deposited on port property.

Sanitation and waste collection:

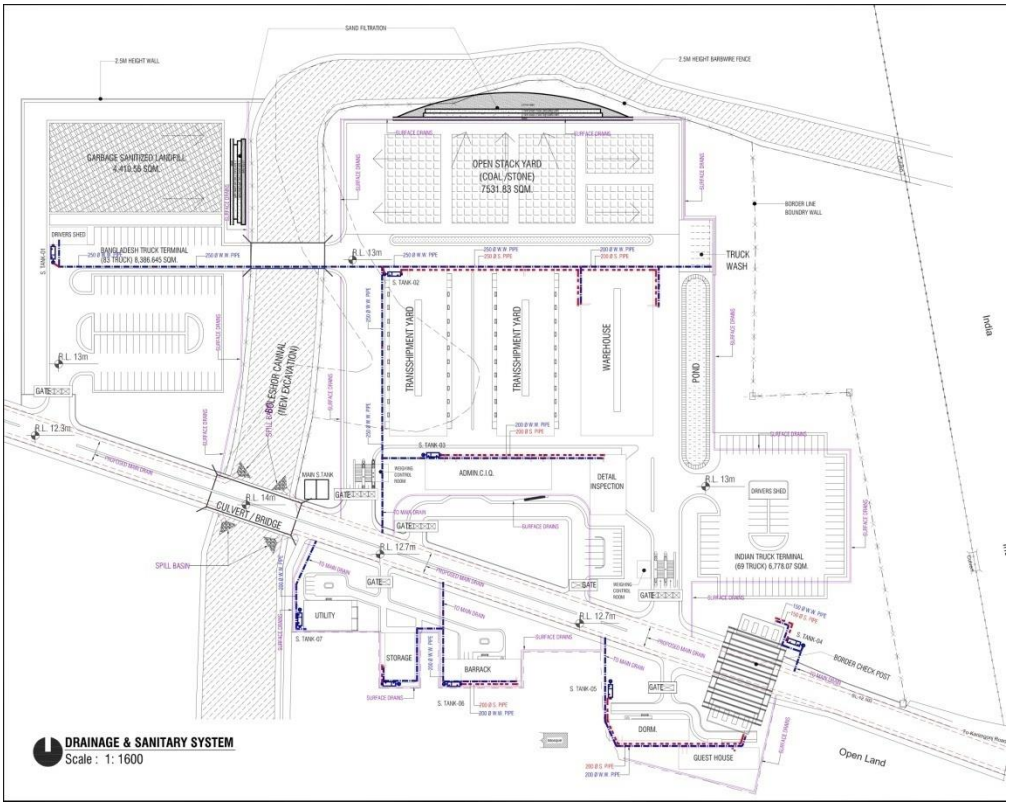
From the toilet liquid waste will generate. Solid wastes will generate from all sources including rejected items. Sanitary and Septic systems and drainage retention ponds

Mitigation:

The detail of sanitation with septic tank for domestic wastewater management and drainage and waste collection system layout is shown in Figure 5.4.
Rotten materials and non-hazardous rejected imported goods, solid wastes from all sources shall be initially collected in the separate bin and dispose properly to the Land ports own sanitary landfill. A small sanitary land fill with 3 acres of land with composting facilities will be implemented for mentioned waste. The Land Port itself should include adequate transfer facilities, collection and segregation of waste for recycling or final disposal, and the landfill shall be located on the land port site, constructed by the contractor as part of the Phase 1 development of the land port, and managed directly by the BLPA port operator. Hazardous and contaminated materials shall be collected separately. Where possible, such hazardous items shall be returned to vendors or approved collection entities. Oil spill and grease will be collected separately and dispose to the DoE registered vendor for disposal after treatment. For such items where suitable off site disposal option is not available, the landfill facility shall include appropriate provisions to properly contain (including secondary containment) and isolate these materials so as to prevent any contamination of groundwater or health and safety risks to workers or users of the port. A detailed solid waste management plan shall be developed prior to the operation phase of the project to detail all appropriate procedures for waste collection, management and disposal. At least three garbage bin should be provided in three suitable locations and fifteen litter bin provided in different locations.

All necessary waste management and final disposal infrastructure included in Phase-I development. Waste Management Cell with its institutional arrangement included in the final design of LP. The Waste Management Cell shall also be responsible to implement the operations stage solid waste management plan.

Figure 5.4 Detail of sanitation and drainage system layout



5.5.8 Solid waste

During Operation and maintenance of port will generate solid waste, discarded material and wastes from offices, residence, dormitories, canteen, rest room, yards, including garbage, recyclable waste, food waste, and other debris. Rejected import items, rotten materials will also be treated as waste.

Mitigation

The following mitigation measures will be implemented:

- Port authority will prepare and implement solid waste collection and disposal plan
- There is a suitable location for disposal of hazardous and non- hazardous waste site.
- Protocols and measures prescribed in the ECoPs (Annex 3) on the management of solid and hazardous waste will be implemented.
- Fuel and hazardous material storage sites, including refuelling facilities, plants located 500 m away from any residential areas.

5.5.9 Cumulative impacts

There will be future link project is widening and improvement of LGED road starting from Sheola Land Port to Beanibazar and Sylhet. There are two other Special Economic Zone (SEZ) projects planned in Chunarughat at Hobigonj and Sherpur at Moulavibazar in the region of Sheola Land Port. There will be no major significant impact on Sheola Land Port during the construction of the two SEZs project. But during the operation period of the two SEZs projects traffic volume and flow will increase through the port and hence air pollution, noise pollution, congestion, safety, and accident risk will occur.

Generally, the focus of cumulative impacts of the land port will mainly lead to the impacts on traffic load and flow. Air, noise pollution and risk of accident is suspected to increase due to increase of traffic volume and flow once the project in full operation. At the land port site, national and WB standards for air and noise quality may be exceeded without mitigation measures. Exceedances over a large area due to cumulative impacts with nearby SEZ developments are not expected, however, as these facilities are not immediately adjacent.

The Sheola Land Port improvements will be carried out on existing facilities and systems and there will be larger quantities of goods passing through the Sheola Land Port once the two SEZs operation. The origins and destinations of the goods being transshipped will increase but overall pattern of movements will change and the Sheola Land Port area and upgrading should make that transfer of goods more efficient.

The introduction of basic occupational health and safety standards for Sheola Land Port operations should have benefits of reducing accidents and consequently decreasing the burden on the limited local health services.

Mitigation

These cumulative impacts will require transport management arrangements. Where impacts exceed accepted environmental standards, mitigation measures are proposed in order to reduce residual impact to acceptable levels and achieve the expected outcomes of the project. For example, various measures are incorporated to reduce noise (plantation/landscaping and perimeter wall) and dust (covering of coal stack yards; spraying of grounds as required; pavement of the facility built into design). The BLPA traffic team of the Sheola land port can take the lead in minimizing the cumulative impacts through better traffic and transport management arrangements.

5.6 Impacts from O&M – Social

5.6.1 Positive socio-economic impacts

The port development will bring lot of socioeconomic development in the region through enhanced business and employment opportunities and through improved transport facilities. There will be employment opportunities in the port both as skilled and unskilled workers.

5.6.2 Community health and safety

The community health and safety impacts associated with port operations are under risk of accidents with activities associated with cargo traffic, and visual concerns from cargo operations are uncontrolled dumping, debris, derelict warehouses and broken machinery.

Mitigation

Traffic control and management will be carried out during operation stage to minimize traffic related impacts. To minimize impacts on visual concerns of the community and improve the cleanliness of port facilities, regular clean up (in the port facilities and water surface) and maintenance will be carried out.

5.6.3 Workers health and safety

The workers' health and safety risks associated with port operations are physical hazards associated with cargo handling and use of associated machinery and vehicles; work with fuels may present a risk of exposure to volatile organic compounds (VOC) via inhalation or

skin contact during normal use or in the case of spills; exposure to dust from handling of dry cargo (depending on type of cargo handled, e.g. cement, grain, and coal) and from roads; and noise from cargo handling, including vehicular traffic, and loading/ unloading.Handling of Caustic soda, Liquid chlorine gas, and Hydrogen peroxide need special precaution, handling, storage.

Mitigation

The surface of the port areas will be constructed with: of adequate strength to support the heaviest expected loads; level, or with only a slight slope; free from holes, cracks, depressions, unnecessary curbs, or other raised objects; continuous; and skid resistant. Materials handling operations should follow a simple, linear layout to reduce the need for multiple transfer points. The Port authority will be a safety System. This safety system would include procedures to regulate the safe movement of trucks within the port facilities, protect the general public from dangers arising from traffic, and prevent events that may result in injury to workers, the public, or the environment. There will be a provision separate segment in the warehouse for Caustic soda, Liquid chlorine gas, and Hydrogen peroxide with fire safety equipment, damages of goods, minimize risk of explosion when there will be demand for that with emergency management system. All types of PPE should be available at work side for ensure safety. All employees should follow the safety rule.

The Safety Management System would also include comprehensive emergency preparedness and response plans that provide a coordinated response based on the port and community resources required to manage the nature and severity of the emergency event.

First aid facilities should be available of all the areas at the port. Port authorities should contract with nearby clinic or hospital for any emergency patient care.

Chapter -6: Environment Management Plans

6 Environmental Management Plans

The basic objective of the EMP is to manage adverse impacts of proposed project interventions in a way that minimizes the adverse impact on the environment and people at the subproject sties. The Land Port will be developed into two phases. Phase 1 development is 5 years and will operational starting from 2010 to 2030 and Phase 2 development years are 2027-2029 and will operationally start from 2030 to 2040. Major work about 65% of work will be done in Phase 1 and rest of the 35% work will be done in Phase 2. Impact and mitigation measure are similar in both the phases. The specific objectives of the EMP are to:

- Facilitate the implementation of the mitigation measures discussed earlier in the document.
- Maximize potential project benefits and control negative impacts;
- Draw responsibilities for BLPA, contractors, consultants, and other members of the project team for the environmental and social management of the Project;
- Define a monitoring mechanism and identify monitoring parameters in order to:
- Ensure the complete implementation of all mitigation measures,
- Ensure the effectiveness of the mitigation measures;
- Maintain essential ecological process, preserving biodiversity and where possible restoring degraded natural resources; and
- Assess environmental training requirements for different stakeholders at various levels.

The EMP will be managed through a number of tasks and activities and site specific management plans. One purpose of the EMP is to record the procedure and methodology for management of mitigation identified for each negative impacts of the subproject. The management will clearly delineate the responsibility of various participants and stakeholders involved in planning, implementation and operation of the subproject.

6.1 Inclusion of Relevant Components of EMP in Contract Documents

The EIAs to be prepared for subprojects should include a section on special environmental clauses to be incorporated in the Tender Document under General/Particular Specification. These clauses are aimed at ensuring that the Contractor carries out his responsibility of implementing the environment management plan (EMP), monitoring plan as well as other environmental and safety measures. Such clauses may specify, for example, penalties for non-compliance as well as incentives to promote strong compliance. The various contractors must be made accountable to implement the plans and mitigation measures which pertain to them through contract documents and/or other agreements of the obligations and importance of the environmental and social components of the project.

6.2 Institutional Arrangements

The Project implementation will be led by the Project Implementation Unit (PIU) that will be established within BLPA. The PIU will be headed by the Project Director (PD). The PIU will consists of an Environment and Social (E&S) Cell with qualified staff. This E&S Cell will assist the PIU on issues related to environmental and social management and oversee the Construction Supervision Consultant (CSC) and contractors and will compile quarterly monitoring reports on EMP compliance, to be sent to the Project Director and also shared with the World Bank, throughout the construction period. The E&S Cell will also provide trainings to the BLPA field personnel responsible for monitoring of environmental compliance during both construction and O&M phases of the project. The Organogram PIU is shown in Figure 6.1.In addition; BLPA will recruit a permanent Environmental, Health and Safety Specialist in all the proposed land ports, who will be responsible for overseeing the

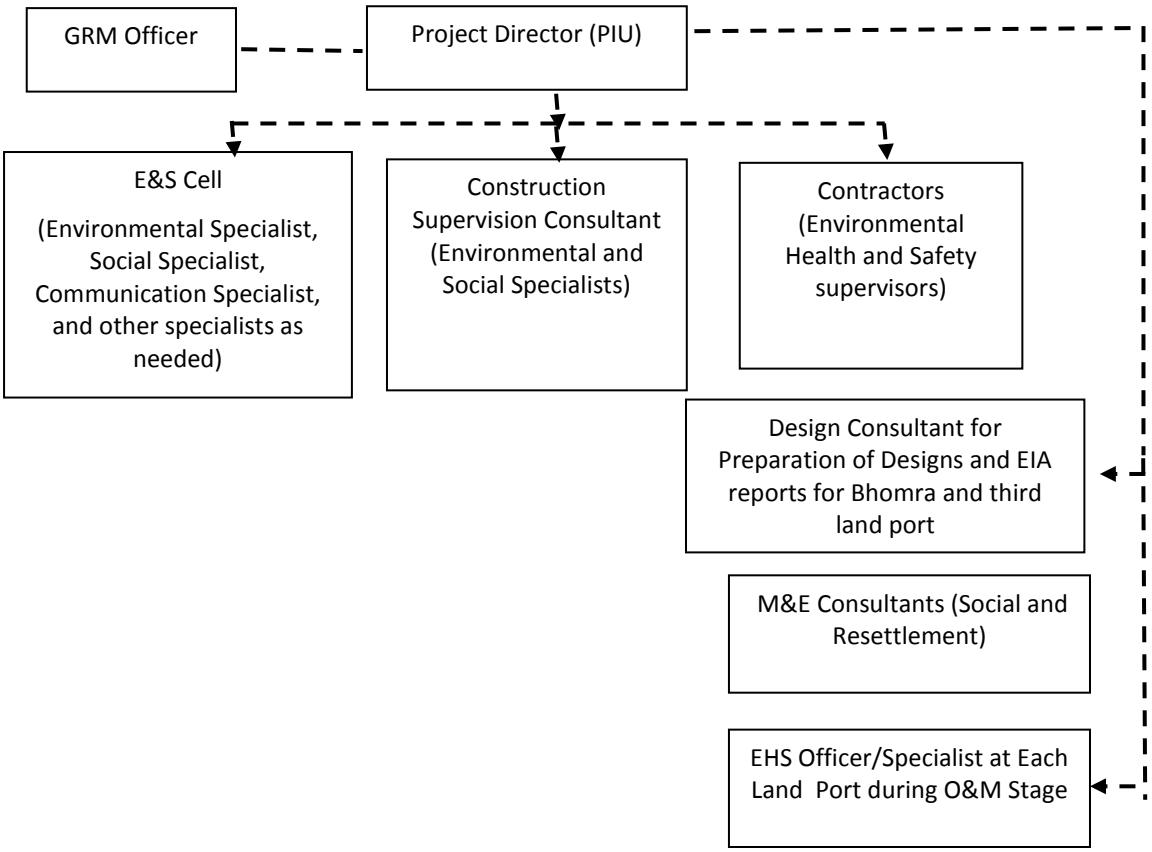
environmental mitigation measures during operation and maintenance period, which will extend beyond the life of the Project and therefore beyond the mandate of the PIU.

The overall responsibility of environmental performance including EMP implementation of the Project will rest with the PIU. Aside from their in-house environmental and social specialists, the PIU will engage construction supervision consultants (CSC) to supervise the contractors including on their execution of construction-related environmental and social management requirements and measures. The CSC will ensure adherence to the design parameters including quality requirements, as well as all EMP measures related to construction.

The E&S Cell will have adequate numbers of environmental and social scientists/specialists and maintain coordination and liaison with CSC for effective EMP implementation. Similarly, the CSC will also have environmental and social specialists who will supervise and monitor the contractors for effective EMP implementation. The contractors in turn will also have HSE supervisors who will ensure EMP implementation during construction activities and will be tasked to develop necessary detailed HSE plans as per this EMP, and oversee their implementation.

The PIU will also be responsible for procurement of consultants for carrying out the EIA and engineering designs for Bhomra and the third land port.

Figure 6.1: Organogram for Environmental and Social Management of the Project



The PIU will also engage an independent organization to carry out external monitoring and evaluation on implementation of RAP; however, this component will not involve monitoring and evaluation of EMP due to limited nature of impacts. The roles and responsibilities of PIU and its consultants are presented in Table 6.1.

Table 6.1: Roles and Responsibilities for EMF Implementation

Organizations	Responsibilities
PIU/BLPA	• Ensure that all project activities are well-managed and coordinated. • Recruitment of consultants for EIA and engineering designs; and approval of EIA by the DOE • Procurement of works and goods. • Payment of compensation to the project affectees • Recruitment and supervision of Construction Supervision Consultants (CSC) • Recruitment and supervision of external monitor and independent Panel of Experts • Carry out environmental assessment of sub projects in Component 1A and preparatory studies in Component 1C in compliance with the World Bank and Government of Bangladesh requirements
E&S Cell within PIU/BLPA	• Responsible for assisting PD with developing TORs and hiring of consultants to carry out any required environmental assessment work for subprojects and also for preparatory studies in Component 1C, reviewing consultant deliverables related to environmental assessment, reviewing bid documents for inclusion of EMP measures, supervising construction activities, producing periodic monitoring reports, • Ensuring inclusion of EMP in bidding documents • Providing training on EMP principles and requirements to CSC, contractors, BLPA field staff, and others as needed to ensure effective implementation of EMP • Supervising CSC for the implementation of EMP • Closely coordinate with other concerned agencies, local governments and communities to support implementation of EMP • Preparation of progress reports on implementation of EMP. • Ensure effective implementation of EMP components not directly tasked to the contractor including components dealing with indirect, induced and cumulative effects, as well as operations and maintenance stage plans and measures. • Commissioning and oversight/review of consultant reports for EIAs/EMPs to be developed for the subcomponents of the Project • Ensure compliance of the studies on Component 1C (Component 1C: Preparation Studies and Activities to Enhance Connectivity of Land Ports and Project Implementation Support) comply with World Bank and Government of Bangladesh requirements. • Responsible for developing standard environmental code of practices during operation stage of land ports
EHS Officer at each Land port	• Responsible for implementing standard environmental code of practices during operation stage of land ports • Implementation of mitigation and monitoring measures during operation stage of the land ports (monitoring of dust, traffic, solid waste collection and disposal, OHS issues, etc.)
Design and EIA Consultants	• Carrying out EIA studies in compliance with the GoB and World Bank guidelines following the EMF • Preparing EMP for inclusion in the bid documents
CSC	• Supervise civil works, ensuring compliance with all design parameters including quality requirements • Supervising contractors for EMP implementation • Prepare monthly reports and submit to PIU • CSC will have dedicated environmental and social staff
Contractor	• Responsible for implementation of mitigation and monitoring measures proposed in the EMP • Each contractor will recruit an Environmental, Health, and Safety (EHS) Manager, who will be responsible for implementing the contractors' environmental, health and safety responsibilities, and liaising with government agencies. S/he will have adequate number of staff to support him/her for these tasks.
M&E Consultant	• External Monitoring and evaluation of Resettlement Action Plan

6.3 Environmental and Social Management

Details of further tasks to be carried out and various plans to be prepared during the course of implementation and operation of the subproject are given in the

Table 6.2.

Table 6.2: Management Plans/ Additional Tasks for the Project

	Plan/Task	Responsibility			Timing
		Plan Preparation	Plan Approval	Review/ Implementation	
1.	Environmental Codes of Practice (ECPs)	ESIA Consultants	BLPA /WB	BLPA through contractors	Already prepared (Annex 3)
2.	Inclusion of environmental clauses in bid documents for various contracts	ESIA Consultants	BLPA /WB	BLPA through contractors	2017-2020
	Plans to be prepared by contractors				
3.	OHS Plan	All contractors	CSC and PIU	All contractors	Before mobilization of each contractor
4.	Pollution Prevention Plans (related to air, noise, soil, water resources)	All contractors	CSC and PIU	All contractors	Before mobilization of each contractor
5.	Filled material management plan	Contractor responsible for site development / land filling	CSC and PIU	Contractor responsible for site development / land filling	Before mobilization
6.	Contaminated soil disposal plan (for existing contaminated soil at site)	Contractor responsible for site development / land filling	CSC and PIU	Contractor responsible for site development / land filling	Before mobilization
7.	Borrow area management and rehabilitation plan	All contractors	CSC and PIU	All contractors	Before mobilization of each contractor
8.	Solid Waste Management and Effluent Management Plan	All contractors	CSC and PIU	All contractors	Before mobilization of each contractor
9.	Drinking Water Supply and Sanitation Plan	All contractors	CSC and PIU	All contractors	Before mobilization of each contractor
10.	Traffic Management Plan	All Contractors	CSC and PIU	All contractors	Before mobilization of each contractor
11.	Construction Camp Management Plan	All contractors	CSC and PIU	All contractors	Before mobilization of each contractor
12.	Fuels and hazardous substances management plan	All contractors	CSC and PIU	All contractors	Before mobilization of each contractor

	Plan/Task	Responsibility			Timing
		Plan Preparation	Plan Approval	Review/ Implementation	
13.	Emergency Preparedness Plan (for construction phase)	All contractors	CSC and PIU	All contractors	Before mobilization of each contractor
	Plans to be prepared for O&M Phase				
14.	O&M Phase Environmental Code of Practices	CSC	BLPA/WB	BLPA	Prior to completion of construction
15.	Environmental Management System (including solid waste management and disposal plan, air and noise quality management and monitoring plan, effluent management and monitoring plan, etc.)	BLPA (through consultants)	-	BLPA	Prior to completion of construction
16.	Safety Management Systems (OHS and Traffic Safety Management)	BLPA (through consultants)	-	BLPA	Prior to completion of construction
17.	Land use planning around the port facilities	Local government (Union Parishad&U pazila		Local government with the support of BLPA	Prior to completion of construction

6.3.1 Environmental Codes of Practice

The environmental codes of practice (ECoPs) are generic, non-site-specific guidelines. The ECoPs consist of environmental management guidelines and practices to be followed by the contractors for sustainable management of all environmental issues. The contractor will be required to follow them and also use them to prepare site-specific management plans (discussed later in the Section). The ECoPs are listed below and attached in Annex 3.

- ECoP 1: Waste Management
- ECoP 2: Fuels and Hazardous Substances Management
- ECoP 3: Water Resources Management
- ECoP 4: Drainage Management
- ECoP 5: Soil Quality Management
- ECoP 6: Erosion and Sediment Control
- ECoP 7: Top Soil Management
- ECoP 8: Topography and Landscaping
- ECoP 9: Borrow Areas Management
- ECoP 10: Air Quality Management
- ECoP 11: Noise and Vibration Management
- ECoP 12: Protection of Flora
- ECoP 13: Protection of Fauna
- ECoP 14: Protection of Fisheries
- ECoP 15: Road Transport and Road Traffic Management

- ECoP 16: Construction Camp Management
- ECoP 17: Cultural and Religious Issues
- ECoP 18: Workers Health and Safety

6.3.2 Mitigations and Compliance Monitoring Plans

The mitigation and compliance monitoring plans are the key element of EMP to be prepared on the basis of impact assessment described in Chapter 5. The Plans describe the potentially negative impacts of each subproject activity, lists mitigation and control measures to address the negative impacts, and assigns responsibilities for implementation and monitoring of these measures. Mitigation and Compliance Monitoring Plan – Construction Phase is shown in Table 6.3 and operation phase shown in Table 6.4.

6.3.3 Construction Stage Site Specific Management Plans

Pollution Prevention Plan will be prepared and implemented by the contractors on the basis of the ECoPs and WBG EHS Guidelines (2007) that will be part of the bidding documents. The Plan will be submitted to the CSC for their review and approval before contractor mobilization.

Solid Waste Management and Effluent Management Plan will be prepared and implemented by the Contractor on the basis of the EMP, ECoP, and WBG EHS Guidelines (2007), which will bepart of the bidding documents. The Plan will be submitted to the CSC for their review and approval before contractor mobilization.

Storm water Drainage: Storm water will be discharge through internal drainage system. A spill basin should be constructed to remove the dirt, grit, silt and other material from storm water before discharge to the canal.

Drinking Water Supply and Sanitation Plan: Separate water supply and sanitation provisions will be needed for the temporary facilities including offices, labor camps and workshops so that it does not shortages and/or contamination of existing drinking water sources. The Plan will be submitted to the CSC for their review and approval before contractor mobilization.

Occupational Health and Safety (OHS) Plan will be prepared and implemented by each contractor on the basis of the WBG EHS Guidelines (2007), ECoPs, and other relevant standards. The Plan will be submitted to the CSC for their review and approval before contractor mobilization.

Contaminated soil disposal plan will be prepared by the contractor responsible for site development / land filling, on the basis of WBG EHS Guidelines (2007), ECoPs, and other relevant standards. In developing the plan, the contractor shall carry out testing of existing potentially contaminated soils at site in locations previously used for coal storage, to determine the level and types of contamination and volume of contaminated soils, and to propose an appropriate disposal solution (for example, lined burial). The plan shall be prepared and implemented prior to initiation of any land clearing or filling activities.

Filled Material Management Plan will be prepared by the contractor to mitigate the impacts related to various activities to be carried out in the soil collection process, such as excavation, lifting and transportation. Fill the land in dry season. If transported by truck then cover the soil by tipple of the truck during transportation. Spray of water is suggested in the construction sites. The location of borrow land is primarily identified Naya Dubagh, Uttar Dubagh, and un-utilized, nonagricultural land nearby Dubagh area. The plan shall be prepared and implemented prior to initiation of any land clearing or filling activities.

Borrow Area Management and Rehabilitation Plan will be prepared and implemented by each contractor on the basis of the WBG EHS Guidelines (2007), ECoPs, and other relevant

standards. The Plan will be submitted to the CSC for their review and approval before contractor mobilization.

Traffic Management Plan will be prepared by each contractor after discussion with BLPA and authorities responsible for roads and traffic. The Plan will be submitted to the CSC for their review and approval before contractor mobilization. The Plan will identify the routes to be used by the contractors, procedures for the safety of the local community particularly pedestrians, and monitoring mechanism to avoid traffic congestion.

Construction Camp Management Plan will be prepared by each contractor. The Plan will include the camp layout, details of various facilities including supplies, storage, and disposal. The Plan will be submitted to the CSC for their review and approval before camp establishment.

Fuel and Hazardous Substances Management Plan will be prepared by each contractor in accordance with the standard operating procedures, relevant guidelines, and where applicable, material safety data sheets (MSDS). The Plan will include the procedures for handling the oils and chemical spills. The Plan will be submitted to the CSC for their review and approval before contractor mobilization.

An **Emergency Preparedness Plan** will be prepared by each contractor after assessing potential risks and hazards that could be encountered during construction. The Plan will be submitted to the CSC/BLPA for their review and approval before contractor mobilization.

Table 6.3: Mitigation and Compliance Monitoring Plan – Pre-Construction/Design Phase

Environmental and sustainability issue	Issues/Impacts/impact sources	Mitigation Measures/Action Plan	Responsibility	
			Execution	Monitoring
Land Port facilities and land use planning	Issues with existing land ports include • Unregulated development around port facilities • Lack of parking areas • lack of adequate passenger facilities; These above issues are also relevant to the proposed land port sites when designing the project facilities	• Design and provide adequate facilities in the land port designs. • As a part of the engineering designs, a long term master plan will be developed for planning of land port facilities with adequate buffer areas around the port facilities. In addition, the project will support creation and/or updating of land use plans around the port areas during project implementation, to help address challenges related to unregulated but anticipated development around the port facilities that falls outside the scope of the land port's jurisdiction and immediate buffer zone.	Consultant Local Government (Union Parishad and Upa Zila)	BLPA
Hydrology	Sheola land port is located near a rainwater drain/channel. The land port may be subjected to floods and also from the bend erosion of the channel.	• Design of land ports will consider flood fore casting and if necessary will construct embankments (or filling the lands above flood levels) for protection of land ports from flooding Bank protection measures to control the erosion of the rainwater drain	Consultant	BLPA
Noise	Noise from port facilities	• Design Plantation development around the boundary walls of the port areas	Consultant	BLPA
Environmental assessment of proposed land ports	The current environmental assessment is based on framework approach; however detailed environmental assessment of each land port needs to be carried out.	• Hiring of consultants and carry out EA studies for all land ports in compliance with this EMF, and World Bank and GoB requirements • Submission of EA documents for DOE and World Bank clearance.	Consultants	BLPA

Table 6.4: Mitigation and Compliance Monitoring Plan – Construction Phase

Environmental and sustainability issue	Issues/Impacts/impact sources	Mitigation Measures	Responsibility	
			Execution	Monitoring
Land development	• Dust pollution • Create nuisance • Road damage • Nutrient loss due to top soil remove • Disposal of potentially contaminated existing soil at site prior to land filling	• Fill the land in dry season • If transported by truck, then Cover the soil by tipple of the truck during transportation • Spray of water is suggested in the road and construction sites • As per capacity of road use the below capacity of truck load • Replace the top soil as nutrient content on the same land • Develop and implement contaminated soil management plan	Contractor	CSC, PIU
Air Quality	• Emissions from construction related traffic and machinery. • Dust from works, other machinery, concrete mixing, and traffic from trucks and vehicles.	• Implement measures in ECoP 10 Air Quality Management. Dust generation will be restricted as much as possible and water sprinkling carried out as appropriate, especially where earthmoving, and excavation are carried out. • Emissions from construction equipment and traffic will comply with World Bank EHS guidelines and will be monitored.	Contractor	CSC, PIU
Surface Water and Sediment Quality	• Increase in water turbidity from construction works near natural water channels. • Waste water from construction camps, offices and warehouses. • Spillage of fuels, oils, and other chemicals, and waste effluents from workshops and washing bays. • Erosion from construction works	• Implement measures in ECoPs 3, 4 and 6 • Installing filter mechanisms (e.g. draining swabs, filter berms, drainage inlet protection, sediment traps and sediment basins) to prevent sediment and particulates from reaching the surface water. •	Contractor	CSC, PIU
Soil and groundwater quality	• Pollution from construction activities and storage facilities. • Soils near the coal storage areas in Sheola are contaminated with coal dust	• Implement ECoP 5: Soil Quality Management • A contaminated soil management plan shall be developed to ensure safe disposal of the soil contaminated with coal dust at Sheola land port • For effluents to be discharged from workshops, camps,	Contractor	CSC, PIU

Environmental and sustainability	Issues/Impacts/impact sources	Mitigation Measures	Responsibility	
		and offices, treatment arrangements such as retention ponds and septic tanks will be incorporated in the facility designs.		
Noise	• During construction on the land, noise levels produced by vehicles, machinery, concrete mixing, and other construction activities will exceed the applicable standards and may cause nuisance to local community	• Limit the noisy construction activities to daylight hours • Maintain the equipment and vehicles as per manufacturer guidelines	Contractor	CSC, PIU
Health and Safety:	• Workers health and safety hazards associated with construction activities • Community health and safety hazards at the construction sites, including exposure to sexually transmitted diseases such as HIV/AIDS	• Implement ECoP 18 pm Workers Health and Safety, ECoP 16: Construction Camp Management • Require all contractors to specify a code of conduct for expectations of worker behavior at site and with local communities • Separation of people from vehicles and making vehicle passageways one-way, to the extent practical • Traffic management • Require personal protective equipment (PPE), as well as required health and safety awareness orientation and training, for all workers. • To ensure the works contract incorporate minimum health and safety provisions and is being monitor by BLPA with the support from CSC during construction.	Contractor	CSC, PIU
Child labour	• Risk of contractors or subcontractors hiring child labour in the construction activities.	• National laws on child labour will be strictly followed. No child labour will be hired by the contractors or subcontractors in any of the project activities. •	Contractor	CSC, PIU

Table 6.5: Mitigation and Compliance Monitoring Plan – Operation Phase

Environmental and sustainability issue	Issues/Impacts/impact sources	Mitigation Measures	Responsibility	
			Execution	Monitoring
Air Quality	• Dust from the access roads and port facilities • Fuel storage facilities and transfer may also release volatile organic compounds (VOC).	• Regularly sweeping yards and handling areas • Keeping transfer equipment (e.g. cranes, forklifts, and trucks) in good working condition • Implementing tank and piping leak detection and repair programs.	E&S Cell	BLPA
Surface Water Quality	• Rain water discharge from material stored in open stack yards, such as coal, may carry soot particles and contaminate the surface waters of nearby streams.	• Installment and maintenance of filter mechanisms (e.g. sand filters, draining swabs, sediment traps and sediment basins) to prevent sediment and particulates from reaching the surface water.	Land Port Operator	BLPA
Soil and groundwater quality	• Leakage and spillage of cargo storages including fuels, waste disposal sites and accidents. • Spills of fuels may occur due to accidents (e.g. collisions, groundings, fires), and storage facilities for backup generators.	• Oil and chemical-handling facilities should be located with consideration of natural drainage systems; • Ports should include secondary containment for above ground liquid storage tanks and tanker truck loading and unloading areas; • Hazardous materials storage and handling facilities should be constructed away from active traffic and protect storage areas from vehicle accidents • Fuel dispensing equipment should be equipped with “breakaway” hose connections that provide emergency shutdown of flow should the fueling connection be broken by movement. • Fueling equipment should be inspected daily to ensure all components are in satisfactory condition. • Preparation of spill prevention, control and countermeasure plan by the BLPA	Port Operator	BLPA
Coal wash water	• May pollute surface and ground water	• After sedimentation in the drain then neutralize the coal wash water in equalization tank (90mx2mx1.5m) followed by pass through multi-grade bed filter(90mx6mx6m) and the filtrate	Land port operator	BPLA

Environmental and sustainability	Issues/Impacts/impact sources	Mitigation Measures	Responsibility	
		discharge to the Boleshorcanal after comply the DoE standard • Continuous monitoring of discharge water from coal to check pH prior to discharge		
Noise	• Noise sources in port operations include cargo handling, vehicular traffic, and loading / unloading containers and ships.	• Consideration should also be given in the planning stage for developing vegetation and walls around the port facilities to reduce noise levels. Alter operations schedules to avoid noise pollution during nights and weekends [this may conflict with BMPs implemented to reduce traffic congestion and truck/train idling emissions during weekdays];	E&S Cell	BLPA
Dust	• Dust from dry bulk storage piles, cargo loading/unloading and maintenance/use of dirt/gravel roads on port and tenant property; • Generation of dust from handling dry bulk materials and blowing of dust from piles.	• Implement a dust suppression program for unpaved roads on port/tenant property, including spraying water (not chemical or petroleum products) at frequent intervals during use and regulating road use (hours and types of vehicles/equipment permitted); • Request results of periodic air monitoring by local 3rd party laboratories to evaluate the effectiveness of the dust suppression program; • Controlling storm water run-off: the size and shape of the storage pile will dictate the amount of run-off and resulting concentration of pollutants. • constructing impermeable storage platform or impervious surfaces or concrete platform. Platform is preferred over either concrete or asphalt as it is less likely to crack, which allows groundwater infiltration; • installing screens in drainage channels to filter suspended solids and attached heavy material. Periodically clean the screens and properly dispose of the sediment; • covering the coal pile with an impervious tarpaulin as soon as possible after unloading and adjusting the cover as material is removed from the pile; • maintaining the working face on the shore side of the	Port Operator, E&S Cell	BLPA

Environmental and sustainability	Issues/Impacts/impact sources	Mitigation Measures	Responsibility	
		pile, to continually increase the distance that storm water run-off must migrate to reach the water • inspecting storage areas after rainfall to observe run-off or storm water migration and implement preventive measures, if required; • A spill basin should be constructed to remove the dirt, silt and other material in the storm water before discharge to the canal. • maintaining an accurate, up-to-date inventory of materials delivered and stored on-site. • suspending unloading and handling operations during un favourable weather conditions (precipitation, wind) that could, otherwise, increase run-off or blowing dust; • regularly inspecting dry bulk storage piles, facilities and handling equipment to ensure proper operation is maintained; • scheduling regular mechanized sweeping of the bulk storage and access/egress areas. [Note: relatively "clean," sweepings should be "returned" to the storage pile; otherwise, sweepings should be screened to remove "trash" and the remainder stored under cover in a bermed area for future use as fill, but only at a distance from waterways necessary to prevent any environmental impacts from stormwater runoff.] • wash down or spray the underside and tires of trucks transporting dry bulk materials on public roads to reduce dust and "track out."		
Occupational health and safety	• Physical hazards associated with cargo handling and use of associated machinery and vehicles. • Work with fuels may present a risk of exposure to volatile organic compounds (VOC) via inhalation or skin contact during normal use or in the case of spills.	• Constructing the surface of port areas to be: of adequate strength to support the heaviest expected loads; level, or with only a slight slope; free from holes, cracks, depressions, unnecessary curbs, or other raised objects; continuous; and skid resistant • Materials handling operations should follow a simple, linear layout to reduce the need for multiple transfer	Terminal Operator	BLPA with support from CSC

Environmental and sustainability	Issues/Impacts/impact sources	Mitigation Measures	Responsibility	
	• Exposure to dust from handling of dry cargo (depending on type of cargo handled, e.g. cement, grain, and coal) and from roads. • Noise from cargo handling, including vehicular traffic, and loading/ unloading. • Exposure or due to handling of Caustic soda, Liquid chlorine gas, and Hydrogen peroxide	points. • Development of Safety System. This safety system should include procedures to regulate the safe movement of trucks within the port facilities, protect the general public from dangers arising from traffic, and prevent events that may result in injury to workers, the public, or the environment. The Safety Management System should include comprehensive emergency preparedness and response plans that provide a coordinated response based on the port and community resources required to manage the nature and severity of the emergency event.		
		• There should be a provision separate segment in the warehouse for Caustic soda, Liquid chlorine gas, and Hydrogen peroxide with fire safety equipment, damages of goods, minimize risk of explosion when there will be demand for that with emergency management system. • To ensure the minimum occupational health and safety provisions and is being monitor by BLPA.		
Community health and safety	• Risk of accidents with activities associated with cargo traffic, • Visual concerns from cargo operations are uncontrolled dumping, debris, derelict warehouses and broken machinery	• Separation of people from vehicles and making vehicle passageways one-way, to the extent practical • To minimize impacts on visual concerns of the community and improve the cleanliness of port facilities, it is required to implement regular clean up (in the port facilities and water surface) and maintenance	Port Operator	BLPA
Odor	• Odor from diesel exhaust emitted by land-based equipment and vessels and vapors from transfer of liquid bulk products;	Diesel Engines" and "Liquid Bulk Storage and Transfer (Loading/Unloading") for BMPs); • Adopt a policy requiring port/tenant employees to report odors they detect to a port manager (odors detected on port/tenant property will be detected on adjacent property);	Port Operator	BLPA

Environmental and sustainability	Issues/Impacts/impact sources	Mitigation Measures	Responsibility	
Trash	• Trash from port/tenant activities "deposited" outside port/tenant property by visitors, service providers, employees, others;	• Conduct a reduce/recycle/reuse (waste minimization) study to identify sources of current waste streams and alternatives to disposal; include a perimeter (and beyond) survey of trash to identify its origins; • Place marked trash containers at locations convenient to visitors, truck operators and employees; • Cover and berm trash collection areas and containers to avoid dispersion by wind and storm water; • Implement solid waste management plan for all trash collection, sorting and disposal activities, including final disposal in the facility landfill as well as any wastes transferred and disposed off site with appropriately licensed disposal entities.	Port Operator, E&S Cell	BLPA
Light	• Light from equipment, vessel operation and parking lots, work areas, buildings.	• Conduct light distribution study, including locations outside the perimeter of port/tenant property; • Incorporate energy efficiency lighting to reduce/eliminate unnecessary lighting and change fixtures to more cost-efficient ones; • If study results or complaints warrant, replace overhead (pole) lighting fixtures with "sharp-cutoff" or "down-shoot" fixtures that focus illumination on the ground; • Issue a policy, restricting truck lights from illuminating areas outside the port/tenant property perimeter when they are not moving;	Port Operator	BLPA
Associate activities (Power line, Road maintenance & widening	• After 5 years road may be damages or unsuitable for use.	• Sylhet to Sheola needs to be strengthened and widened after an initial 5 years of operation of the land port. • There should be extended over the existing power line along the road side. No Impact of electromagnetic radiation, crop loss and tree cutting. Only during	Port Operator	BLPA

Environmental and sustainability	Issues/Impacts/impact sources	Mitigation Measures	Responsibility	
		extension work safety measure will require.		
Traffic congestion	• Traffic congestion from truck queuing, security checks, service deliveries, etc	• Direct truck traffic to queue on port/tenant property, only; if necessary, remind rail operators of local/state laws restricting street blocking at railroad crossings; • Survey port/tenant employees' interest in carpooling, to reduce congestion and vehicle emissions; • Cooperate with local officials in preparing plans to alleviate congestion in the port area; Ensure that signage, traffic controls and pavement markings on streets/roads near the port and at its entrances conform to state and federal requirements.	Port Operator	BLPA

6.4 Monitoring Program

As one of the key elements of the EMP, a two-tier monitoring program has been proposed comprising compliance monitoring and effects monitoring. The main purpose of this monitoring program is to ensure that the various tasks detailed in the EMP particularly the mitigation measures are implemented in an effective manner, and also to evaluate program impacts on the key environment and social parameters. Various types of EMP monitoring are discussed below.

6.4.1 Compliance Monitoring

The purpose of the compliance monitoring is to ensure that the contractor implements the mitigation measures given in the EMP are effectively and timely implemented. This monitoring will generally be carried out by the CSC with the help of checklists prepared on the basis of the mitigation measures given in Chapter 5.

6.4.2 Effects Monitoring

Effects monitoring is a very important aspect of environmental management to safeguard the protection of environment. The effects monitoring plan proposed for the subprojects is presented in Table 6.6; which will be revisited and revised during EIA studies. The monitoring will comprise surveillance to check whether the contractor is meeting the provisions of the contract during construction and operation of the project including the responsible agencies for implementation and supervision. Compliance indicators or threshold limits for the monitoring are also given in Table 6.6.

Table 6.6: Effects Monitoring Plan

Parameter/ Activity	Location	Means of Monitoring	Compliance indicator/ threshold limits	Frequency	Responsible Agency	
					Implementation	Supervision
During Construction						
Hydrocarbon and chemical storage	Construction camps and yards	Visual Inspection of storage facilities	No leakages from the containers in the storage	Monthly	Contractor	CSC
Traffic Safety	Access Roads	Visual inspection to see whether proper traffic signs are placed and flag-men for traffic management are engaged	Smooth flowing of traffic; and placement of traffic signs and flag-men	Monthly	Contractor	CSC
Dust	Construction sites	Visual inspection to ensure good standard equipment is in use and dust suppression measures (e.g., spraying of waters) are in place.	No dust generation from the construction activities	Daily	Contractor	CSC

Parameter/ Activity	Location	Means of Monitoring	Compliance indicator/ threshold limits	Frequency	Responsible Agency	
					Implementation	Super-vision
	Material storage sites	Visual inspection to ensure dust suppression work plan is being implemented	No dust generation from the material storage sites	Monthly	Contractor	CSC
Air quality (PM, CO_2, SOx, NOx)	Near the land ports	24 hours continuous monitoring with the help of appropriate instruments and analyzers	Compliance with the DOE standards	Quarterly during the construction phase	Contractor	CSC
Water Pollution	During Construction	Measurement of pH, EC, Turbidity, DO, Coli form, BOD, NH_4N Oil and Grease. Sampling point is outlet of LP drain.	Compliance with the DOE standards	Quarterly during the construction phase	Contractor	CSC
Noise	Construction sites	Noise measurement using noise meter; Ensure work restriction between 21:00-06:00 close to the residential areas	Compliance with DOE standards	Monthly	Contractor	CSC
Water quality (For all drinking water parameters including arsenic, iron and coliforms)	Locations of tube-well installation installed for each land port	Depth of tube well should be more than 30m. Test water for arsenic and iron before installing of casing. If the quality is found not suitable further deepening will be done.	Compliance with DOE drinking water standards	During drilling of wells	Contractor trough a nationally recognized laboratory	CSC
	Water wells to be used by contractors for drinking	Laboratory analysis of all drinking water parameters specified in national standards	Compliance with DOE drinking water standards	After development of wells	Contractor trough a nationally recognized laboratory	CSC
Waste Management	Construction camps and construction sites	Visual inspection that solid waste collection facilities are in place and waste is disposed at designated site	Facilities are clean and waste collection and disposal facilities are in place	Monthly	Contractor	CSC
Drinking water and sanitation	Camps, offices	Ensure the construction workers are	Availability of safe drinking water and	Monthly	Contractor	CSC

Parameter/ Activity	Location	Means of Monitoring	Compliance indicator/ threshold limits	Frequency	Responsible Agency	
					Implementation	Super-vision
		provided with safe water and sanitation facilities in the site	sanitation facilities			
Cultural and archeological Sites	At all work sties	Visual observation for chance finds	Indication of chance finds	Daily	Contractor	CSC, BLPA
Restoration of Work Sites	All Work Sites	Visual Inspection	The facilities are clean with no waste at the works sties	After completion of all works	Contractor	CSC, M&E Consultant, BLPA
Safety of workers Monitoring and reporting accidents	At work sites	Usage of Personal Protective equipment and implementation of contractor OHS plan	All workers should use necessary PPEs	Monthly	Contractor	CSC, BLPA
Grievances	In the project area	Number of grievances registered and addressed	Minutes of grievance redress meetings	Monthly	PIU	CSC, BLPA
Reporting on Environmental Monitoring	During Construction	All parameters	To meet the compliance requirement	Quarterly	PIU	BLPA
During Operation and Maintenance						
Dust	• At all land port facilities and access roads;	Visual inspection	No visible dust	Weekly	EHS Officer of respective Port	BLPA
Traffic safety	At all land port facilities and access roads	Visual inspection	NO traffic congestion	Weekly	EHS Officer of Port	BLPA
Cleanliness	At all land ports	Visual Inspection	Facilities are clean with no garbage	Weekly	EHS Officer of respective Port	BLPA
Solid waste collection	At tall land ports	Visual inspection that waste collection facilities are in use	Waste collection and disposal facilities are in place	Weekly	EHS Officer of respective Port	BLPA
Workers and community health and safety	At all land ports	Visual inspection on health and safety issues	Use of necessary PPEs by workers	Monthly	EHS Officer of respective Port	BLPA

Parameter/ Activity	Location	Means of Monitoring	Compliance indicator/ threshold limits	Frequency	Responsible Agency	
					Implementation	Super-vision
Accidents	At all land ports	Visual assessment and Interviews with involved people	Accident reports	As and when happened	EHS Officer of respective Port	BLPA
Drinking water and sanitation facilities	At all land ports	Visual inspection and interviews	Availability of safe drinking water and sanitation facilities	Monthly	EHS Officer of respective Port	BLPA
Air quality (PM, CO_2, SOx, NOx)	Near the land port at the two closest residential locations	24 hours continuous monitoring with the help of appropriate instruments and analyzers	Compliance with the DOE standards	Quarterly	EHS Officer of respective Port	BLPA
Water Pollution	At all discharge points from the facility including especially the coal equalization tank discharge point; and in the channel both immediately upstream and downstream of the project site	Measurement of pH, EC, Turbidity, DO, Coli form, BOD, NH_4N Oil and Grease	Compliance with the DOE standards. As per Annex 5.	Quarterly – for all parameters at all locations Weekly - for pH at discharge point of coal wash water equalization tank	EHS Officer of respective Port	BLPA
Noise	• at the two closest residences / residential areas.	Noise measurement using noise meter; Ensure work restriction between 21:00-06:00 close to the residential areas	Compliance with DOE standards	Monthly	EHS Officer of respective Port	BLPA
Waste Management	Operation of the port	Visual inspection that solid waste collection facilities are in place and waste is disposed at designated site	Facilities are clean and waste collection and disposal facilities are in place	Monthly	EHS Officer of respective Port	BLPA

6.5 Performance Indicators

For evaluating the performance of the environmental management and monitoring plan, performance indicators are identified for efficient and timely implementation of measures/actions proposed in EMP. The indicators are defined both for implementation phase and for operation phase. CSC will be responsible for compiling the information on these indicators and report to BLPA.

To measure the overall environmental performance of the project, a list of performance indicators is given below; however a detailed list of indicators will be prepared by EIA studies

- Number of inspections carried out by CSC per month
- Number of non-compliances observed by CSC or E&S.
- Availability of environmental specialists in E&S.
- Availability of environmental specialists in CSC.
- Availability of environmental specialists with contractors.
- Timely reporting of documents (as defined in EMP and monitoring plan)
- Number of trainings imparted to stakeholders/other capacity building initiatives
- Timely disbursement of compensation/ timely resettlement of project affectees
- Timely implementation of resettlement schedule.
- Number of grievances received.
- Number of grievances resolved.
- Number of construction related accidents.

6.6 Grievance Redress Mechanism

BLPA will establish a project level Grievance Redress Mechanism (GRM)[7]based on its existing institutional mechanism. A three tier grievance redress committees (GRC) will be established for this Project. The tier 1 GRM consists of the Port In-charge, a representative from the local government, and a representative from the affected communities. When dealing with the complaints on environmental issues, the committee will take advise of the environmental specialists of the CSC and E&S Cell. The second tier of GRM consists of the Project Director, the GRM Officer of the BLPA (BLPA has already a GRM officer on board) and a representative of district government. The third tier of GRM consists of the Secretary of Ministry of Shipping. The grievance management system will be communicated to the local and affected communities. A toll free number will also be setup to receive the grievances.

6.7 Capacity Building

Capacity building for effective implementation of the environmental and social safeguard requirements is a key element of the EMP. Capacity building for environmental and social safeguard management will need to be carried out at all tiers of the project, including BLPA, E&S Cell, CSC, and contractors. At the construction site, CSC will take the lead in implementing the capacity building plan, though the contractors will also be responsible to conduct trainings for their own staff and workers. The various aspects that are covered under the capacity building will include general environmental and social awareness, key environmental and social sensitivities of the area, and key environmental and social impacts of the project, EMP requirements, OHS aspects, and waste disposal. Table 6.7provides a summary of various aspects of the environmental and social trainings to be conducted at the construction site. E&S Cell may revise the plan during the project implementation as required.

[7] Further details on GRM are available in RPF.

During the O&M phase of the project, these trainings will continue to be conducted by BLPA staff for all relevant O&M personnel and community.

Table 6.7: Environmental and Social Trainings

Contents	Participants	Responsibility	Schedule
General environmental and socioeconomic awareness; Environmental and social sensitivity of the project influence area; Mitigation measures; Community issues and workers' code of conduct; Grievance Mechanism; EMP Awareness of transmissible diseases Social and cultural values.	PIU; CSC; selected contractors' crew	CSC	Prior to the start of the field activities. (To be repeated as needed.)
EMP; Waste disposal; OHS	Construction crew	Contractors	Prior to the start of the construction activities. (To be repeated as needed.)
Road/waterway safety; Defensive driving/ Waste disposal; Cultural values and social sensitivity.	Drivers; boat/launch crew	Contractors	Before and during the field operations. (To be repeated as needed.)
Camp operation; Waste disposal; OHS Natural resource conservation; Housekeeping.	Camp staff	Contractors	Before and during the field operations. (To be repeated as needed.)
Restoration requirements; Waste disposal.	Restoration teams	Contractors	Before the start of the restoration activities.

6.8 Documentation

TheE&S Cell with assistance from CSC and contractors will produce the following environmental reporting documentation:

Environmental Monitoring Reports: The environmental monitoring reports will include environmental mitigation measures undertaken, environmental monitoring activities undertaken, details of monitoring data collected, analysis of monitoring results particularly the non-compliances, recommended mitigation and corrective measures, environmental training conducted, and environmental regulatory violations observed. The environmental monitoring reports will be submitted quarterly during the construction period and annually for three years after completion of construction.

Project Completion Environmental Monitoring Report: One year after completion of construction, the E&S Cell will submit a Project Completion Environmental Monitoring Report which will summarize the overall environmental impacts from the project.

For the land ports that will be identified and designed during implementation, ESIA and RAP will be submitted by the BLPA for World Bank review and clearance.

6.9 EMP Implementation Cost

The mitigation measures that are already part of the design such as drainage, and filter media for storm water treatment from the coal storage areas have already been included in the construction cost. The cost of establishing E&S Cell in the PMU and environmental staff of the CSC consultants have also been included the overall Project's EMF. Detailed cost estimates for environmental mitigation is given in Tables 6.8; costs for monitoring during construction are given in Table 6.9and costs for monitoring during operation and maintenance are given in Table 6.10. Environmental Mitigation Cost during O&M Phase of Sheola Land Port in shown in Table 6.11.Environmental Monitoring Cost during O&M Phase of Sheola Land Port is shown in Table 6.12.

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Total costs of EMP implementation for Sheola Land Port will be BDT23.4 million (USD 0.292 million). For phase one cost is BDT 13.6 million (USD 0.17 million)

Table 6.8: Environmental Mitigation Costs during Construction (1st Phase for 3.5years) of Sheola Land Port

Sl. No.	Description of Item	Unit	Quantity	Unite Rate (BDT)	Item Total (BDT)
01	During carrying soil for land filling and during construction period dust management by water sprayer	LS	-	-	300,000
02	Maintenance and protection of traffic including construction of diversion road, warning signs, posting of signboard detaining project activities	LS	-	-	200,000
03	Campsite waste disposal facilities	Nos.	4	50,000	200,000
04	First aid box for treatment of injuries on emergency situations,PPE etc	Nos.	1	50,000	50,000
05	Water supply Tube wells	Nos.	1	50,000	50,000
06	Sanitary Facilities	Nos.	2	25,000	50,000
07	Tree plantation and green area development plan	LS	-	-	200,000
08	Water quality protection measures: soil erosion and sedimentation control at the construction site, and prevention of spillages, leakages of polluting materials, etc. to be satisfaction of the engineer.	LS	-	-	200,000
09	Stripping topsoil from borrowed agricultural lands, stockpiling and replacing the same to rehabilitate the land to the entire satisfaction of the owner and the engineer.	LS	-	-	1,00,000
10	Rehabilitation of ancillary sites including stockpile sites, brick crushing sites, borrow areas, work force camps/ site office, etc and turfing to the entire satisfaction of	LS			150,000
11	Orientation to the technical personnel/ construction worker associated with the port about the key issues of EMP & Environmental Monitoring				100,000
12	Capacity building of BLPA staff for general and cumulative impact mitigation				200,000
	Total in Tk. Eighteen lac only				**1,800,000**

Table 6.9: Environmental Mitigation Costs during Construction (2nd Phase for 2.5years) of Sheola Land Port

Sl. No.	Description of Item	Unit	Quantity	Unite Rate (BDT)	Item Total (BDT)
01	During carrying soil for land filling and during construction period dust management by water sprayer	LS	-	-	300,000
02	Maintenance and protection of traffic including construction of diversion road, warning signs, posting of signboard detaining project activities	LS	-	-	100,000
03	Campsite waste disposal facilities	Nos.	1	50,000	50,000
04	First aid box for treatment of injuries on emergency situations, PPE etc	Nos.	1	50,000	50,000
05	Water supply Tube wells	Nos.	1	25,000	25,000
06	Sanitary Facilities	Nos.	2	25,000	50,000
07	Tree plantation and green area development plan	LS	-	-	100,000
08	Water quality protection measures: soil erosion and sedimentation control at the construction site, and prevention of spillages, leakages of polluting materials, etc. to be satisfaction of the engineer.	LS	-	-	100,000
09	Stripping topsoil from borrowed agricultural lands, stockpiling and replacing the same to rehabilitate the land to the entire satisfaction of the owner and the engineer.	LS	-	-	1,00,000
10	Rehabilitation of ancillary sites including stockpile sites, brick crushing sites, borrow areas, work force camps/ site office, etc and turfing to the entire satisfaction of RE.	Sq. m	1000	50	50,000
11	Orientation to the technical personnel/ construction worker associated with the port about the key issues of EMP & Environmental Monitoring				100,000
12	Capacity building of BLPA staff for general and cumulative impact mitigation				200,000
	Total in Tk. Twelve lac twenty-five thousand only				**1,225,000**

Table 6.10: Environmental Monitoring Costs during Construction of Sheola Land Port

Component	Stage	Item	Unit Cost (BDT)	Quantity (Yearly)	Total Costs (BDT)
Awareness, Warning signs, labels and signals Accident	During Construction	Ensuring that HSMP works right on the track	**--**	**--**	150,000
Campsite waste disposal facilities	During Construction	Avoid disease	75,000	2	150,000
Air Pollution	During Construction	Measurement of SPM, PM_{10}, $PM_{2.5}$, NO_X, SO_2, CO. (2 locations)	100,000	4	400,000
Water Pollution	During Construction	Measurement of pH, EC, Turbidity, DO, Coli form, BOD, NH_4N Oil and Grease	15,000	4	60,000
Waste	During Construction	Collection, transportation and dumping of waste at authorized dumping sites. Minimization of volume and recycling.	--	--	600,000
Noise	During Construction	Periodical maintenance of construction vehicles and installation of sound insulation cover	5,000	12	60,000
Drinking Water supply and sanitation	During Construction	Arsenic free water/ Treatment and test cost	10,000	12	120,000
Reporting on Environmental Monitoring	During Construction	Quarterly Monitoring Report	150,000	4	600,000
Grand Total	**In Word Tk. Twenty-one lac forty thousand only**				**2,140,000**
	For 1st Phase (3.5 years) Tk. Sixty four lac twenty thousand only				**7,490,000**
	For 2nd Phase (2.5 years) Tk. Eighty five lac sixty thousand only				**5,350,000**

Table 6.11: Environmental Mitigation Cost during O&M Phase of Sheola Land Port

Sl. No.	**Description of Item**	**Unit**	**Quantity**	**Unite Rate (BDT)**	**Item Total (BDT)**
01	Ongoing maintenance of storm water (Spill basin) coal wash Filter and site drainage	LS	**-**	**-**	200,000
02	Ongoing spraying/dust management	LS	-	-	100,000
03	First aid box for treatment of injuries on emergency preparedness situations, PPE	Nos.	2	50,000	100,000
04	Ongoing tree plantation, green area development plan and land scaping maintenance	LS	-	-	300,000
05	Solid Waste Management	LS			300,000
06	Garbage and litter	LS			100,000

Sl. No.	Description of Item	Unit	Quantity	Unite Rate (BDT)	Item Total (BDT)
07	O&M Phase Environmental Code of Practices	LS			100,000
08	Environmental Management System (waste disposal, air and noise quality, etc.)	LS			500,000
09	Safety Management Systems (OHS Management)	LS			200,000
10	Land use planning around the port facilities	LS			200,000
11	Personnel cost for EHS officer	LS			1,800,000
	Total in Tk. Thirty-ninelac only				**3,900,000**

Table 6.12: Environmental Monitoring Cost during O&M Phase of Sheola Land Port

Component	Stage	Item	Unit Cost (BDT)	Quantity (Yearly)	Total Costs (BDT)
Air Pollution	During operation	Measurement of PM_{10}, $PM_{2.5}$, NO_X, SO_2, CO.	100,000	4	400,000
Water Pollution	During operation	Measurement of pH, EC, Turbidity, DO, Coli form, BOD, NH_4N Oil and Grease	25,000	4	100,000
		Procurement and calibration of Digital pH meter to carry out weekly / ongoing pH monitoring at discharge point of coal yard equalization tank (more cost-effective than relying on accredited laboratory on ongoing basis)	35,000	1	35,000
Soil and Ground water	During operation	Measurement of pH, EC, Turbidity, DO, Coli form, BOD, NH_4N Oil and Grease in water and heavy metal in soil.	25,000	4	100,000
Noise	During operation	Securement of buffer zone around 100m as noise decay distance	5000	12	60,000
Drinking Water supply and sanitation	During operation	Water Treatment and test cost	20,000	12	240,000
Reporting on Environmental Monitoring	During Operation	Quarterly Monitoring Report	150,000	4	600,000
Grand Total	**In Word Tk. Fifteen lac only**				**1,535,000**

Chapter -7: Consultations and Disclosure

7 Consultations and Disclosure

Field surveys and consultations with different stake holders including affected communities were carried out to throughout EIA studies. Consultation meetings were held through focus group discussions, individual meetings and public consultations. Details of stakeholders relevant to the Sheola Land Port are

Primary Stakeholders:

Affected households, BLPA, Ministry of Shipping, Customs Department, Border Guard Bangladesh, Immigration Department, Labour Unions, Clearing and Forwarding Agents, Department of Agriculture, Department of Veterinary, Trade Associations, Truckers Unions, and Chamber of Commerce.

Secondary Stakeholders:

Local government of Union Parishad and UpaZila; Local Government Engineering (LGED), Department of Environment, Department of Social Welfare, Roads and Highways Department.

The summary of consultation is shown in Table 7.1.

Table 7.1: Summary of Consultation

Sl. No.	Comment	Response/Action Plan
1	How was the replacement cost was estimated what is the level of impact on livelihood?	The replacement cost is estimated based on the actual cost to buy or re-build same thing (land or structure) that was lost due to resettlement, and this has been estimated based on market rates. Details are given in RPF. The impact on livelihood from development of Sheola Land Port is severe on 12 persons who are in restaurant business (4 tenants and 8 employees).
2	It has always been seen that facilities for workers are neglected while designing facilities for land port. Is there any resting space for workers in your proposed land port?	Workers waiting room with toilet facilities will be provided in the land ports.
3	What is the timeline for completion of detailed design?	Detailed design of Sheola land port is in final stage
4	1. The lands that are already developed in Sheola (low land areas that were already filled with soil) should be given more compensation than the low lying lands. 2. For compensation of buildings right amount should be calculated. 3. Compensation should be given to shops that will be affected by land acquisition 4. Right Amount of land price should be Given	Compensation for loss of land and structures has been estimated at full replacement cost. Compensation will also be provided for the loss of businesses. Details of entitlements are given in RPF.
5	Have you considered the effect of radioactive and hazardous chemicals to the surrounding areas which will be imported to the port?	Hazardous materials such as fuels will be stored in the warehouses. No radioactive materials will be transported through the land ports.
6	How much revenue will be generated from Sheola	According to the feasibility study of Shaula land port, the revenue will be initially 1.4 million USD per year, and in 2049 it will 10.23 million per year

Sl. No.	Comment	Response/Action Plan
7	In addition to the facilities that are provided to the various stakeholders, adequate facilities are also should be given to the BLPA staff.	All adequate facilities will be provided to BLPA staff such as office building, dormitories, guest house, restaurant, water supply and sanitation facilities.
8	There should be hospital facilities in every land port.	First aid facilities will be provided at the land ports. Hospital facilities are available within 13 km distance from the proposed Shaula
9	Coal that is being transported from north east India is reported to have high sulphur content and hence adequate measures should be in place to control coal dust. Also there should be air quality monitoring during operation phase. The district level offices of DOE should be consulted during EIA studies.	Dust control measures will be included in the project design during handling and storage of coal. Coal will be stored in open stack yards built on concrete platforms. Coal storage areas will be covered with tarpaulin. Coal wash water from high sulphur will be generally acidic and will be neutralized before filtration and discharge to ensure DOE standards are complied. Air quality will be monitored during operation and maintenance phase. The district level DOE offices will be consulted during the EIA studies.

7.1 Consultation Meetings

Consultation meetings were held at Sheola during project preparation and to share the draft EIA reports. A public consultation meeting was held on 7th May 2016 with the local communities. Notices about the consultation meeting were circulated to the local communities through leaflets one week in advance of the meeting. Posters were also displayed at public places (at Union ParishadBhavan, market). Additionally, meetings were also held with local government officials and customs officials. Photographs of these consultations are given in Figure 7.1 and Figure 7.2 for local and national consultations, respectively.During these consultations, leaflets on key environmental and social issues were distributed to the participants (these were prepared in local language) and big size posters were also displayed at the venue. Power point presentations were made by the environmental and social experts. Participants were encouraged to ask questions on the environmental and social issues. Details of Consultation Meetings are shown in Table 7.2.Photographs of national consultation meeting at Dhaka is shown in Figure 7.3.

Table 7.2: Details of Consultation Meetings

Date	Meeting	Male	Female	Total
April 2016	Focus group discussions	33		33
7th May 2016	Public consultation Dubagh Union Parishad	75	4	79
10th August 2016	Public consultation at Dhaka	159	14	173
Total		**267**	**18**	**285**

Figure 7.1: Photographs of Focus Group Discussions at Sheola

Figure 7.2: Photographs of Public Consultations at Sheola

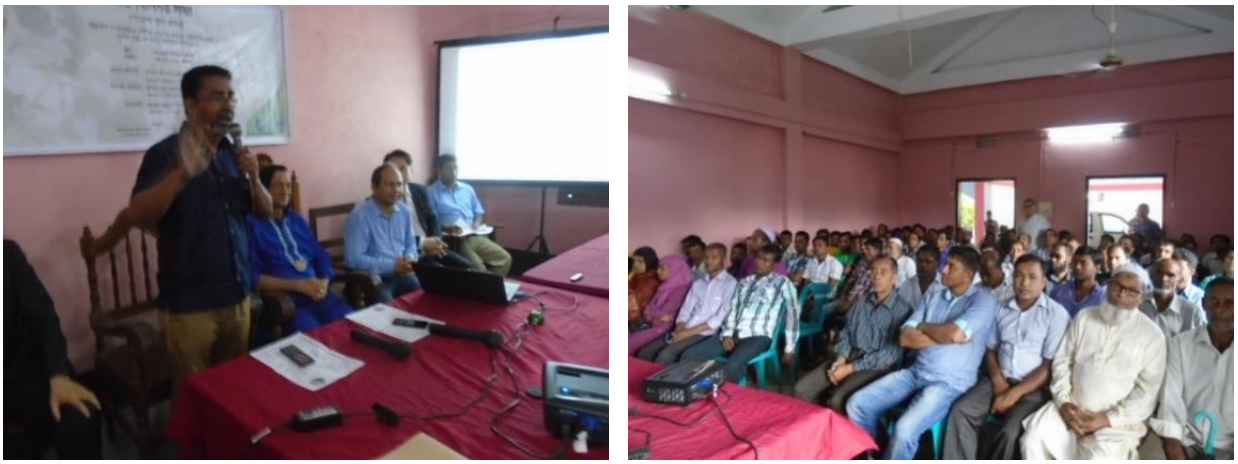


Figure 7.3: Photographs of national consultation meeting at Dhaka

7.2 Key Findings of the Consultations

All the stakeholders and local community appreciated the project. The concern of the consultation participants was mainly focused on land acquisition and impact on livelihood, environmental issues including dust pollution. The summary of points discussed in these consultation meetings are given in Table 7.3.Summary of National Public Consultation is shown in Table 7.4.

Table 7.3: Summary of Local Public Consultations

Sl. No.	Feedback /Comment from Participant	Action/Response
1	Happy for this project. Will benefit from the transport. Communication will develop. Lots of development in the region will improve the socioeconomic condition.	
2	We want proper compensation for the land acquisition, removal of structures, rent of open land loss, business loss, daily income loss, employee income loss and affected families.	Proper compensation will be paid to all affectees
3	Some of the tenants of the shops want compensation for their loss	Proper compensation will be paid to all the affectees including tenants and also employees
4	Dust and noise will generate and create problem during construction. Take care of noise and dust.	Dust and noise control measures are included in the EMP
5	Labour should be recruited from nearby area. Local people should get priority in employment opportunities	Labour will be employed from the local area.
6	Job facility for local people during operation	Preference will be given for the local people.

Table 7.4: Summary of National Public Consultation

Sl. No.	Question	Reply/Response
1	How did you define Replacement cost? And what is the level of impact on livelihood?	The replacement is estimated based on the actual cost to buy or re-build same thing that was lost due to resettlement, and this has been estimated based on market rates. The impact on livelihood from development of Sheola Land Port is severe on 12 persons who are in restaurant business (4 tenants and 8 employees)
2	It has always been seen that facilities for workers are neglected while designing facilities for land port. Is there any resting space for workers in your proposed land port?	Workers waiting room with toilet facilities are provided in the Sheola land port.
3	How much time is required to complete the design?	Detailed design of Sheola land port is in final stage
4	1. The lands that are already developed in Sheola (filled areas of low land) should be given more compensation than the low lying lands. 2. For compensation of buildings right amount should be calculated. 3. Compensation should be given to shops that will be affected by land acquisition 4. Right Amount of land price should be Given	Compensation will be provided to all the structures including shops that are affected by the land acquisition. Compensation for structures has been estimated at a replacement cost. Compensation will also be provided for the loss of businesses.
5	Have you considered the effect of radioactive and hazardous	Hazardous materials such as fuels will be stored in the warehouses. No radioactive materials will be

Sl. No.	Question	Reply/Response
	chemicals to the surrounding areas which will be imported to the port?	transported through the port.
6	1) From Sheola port how much Revenue will earn government that is forecasted	According to the feasibility study of Sheola land port, the revenue will be initially 1.4 million USD per year, and in 2049 it will 10.23 million per year
7	We have show that you are providing different facilities for the stake holder but what you think about the facilities for the employer who will do the job.	The BLPA staff will have office building, dormitories, guest house, restaurant, water supply and sanitation facilities.
8	There should be hospital facilities in every land port.	First aid facilities will be provided at the land ports. Hospital facilities are available within 13 km distance from the proposed Sheola Land Port
9	Is there Sulphur pollution from coal dust. DoE is now revising the ECR, Involve local DoE office for public consultation meeting, Check the land issue (RAP), air pollution should be considered.	Only low grade coal having sulphur content. Coal wash water will be acidic and should be neutralized before filtration and discharge after meeting DoE compliance. DoE will be invited in the PC Meeting, Land issue will be checked. Air pollution issue considered in the detail design.

7.3 Access to Information

The EIA, SIA and RAP reports will be disclosed in the BLPA website. Consultation workshops were held at both local and national level to share the results of the draft reports. A national public consultation was held on August 10, 2016 at Dhaka to disclose these draft reports. The detail of public consultation is presented in Annex 6. Newspaper advertisements on the national public consultation event were given in English and Bengali. Further, invitations were also sent to relevant stakeholders including local government officials and local community. The documents will also be sent to the World Bank info shop. The executive summaries of EIA, SIA and RAP documents will also be translated and will bemade available to the local communities by placing them at existing customs offices or land port offices.

Annexure

ANNEX 1Data Collection, Compilation and Analysis of Hydrological Data

Sheola is a BWDB hydrological data station on the Kushyara River and very near to the project. As such, the station represents the project. Both water level as well as discharge data has been collected from BWDB. **Table H.1** shows the list of the data collected. The location of the station has been shown in **Figure H.1.**

Table H.1 Collected Water level and discharge data of Kushyara River

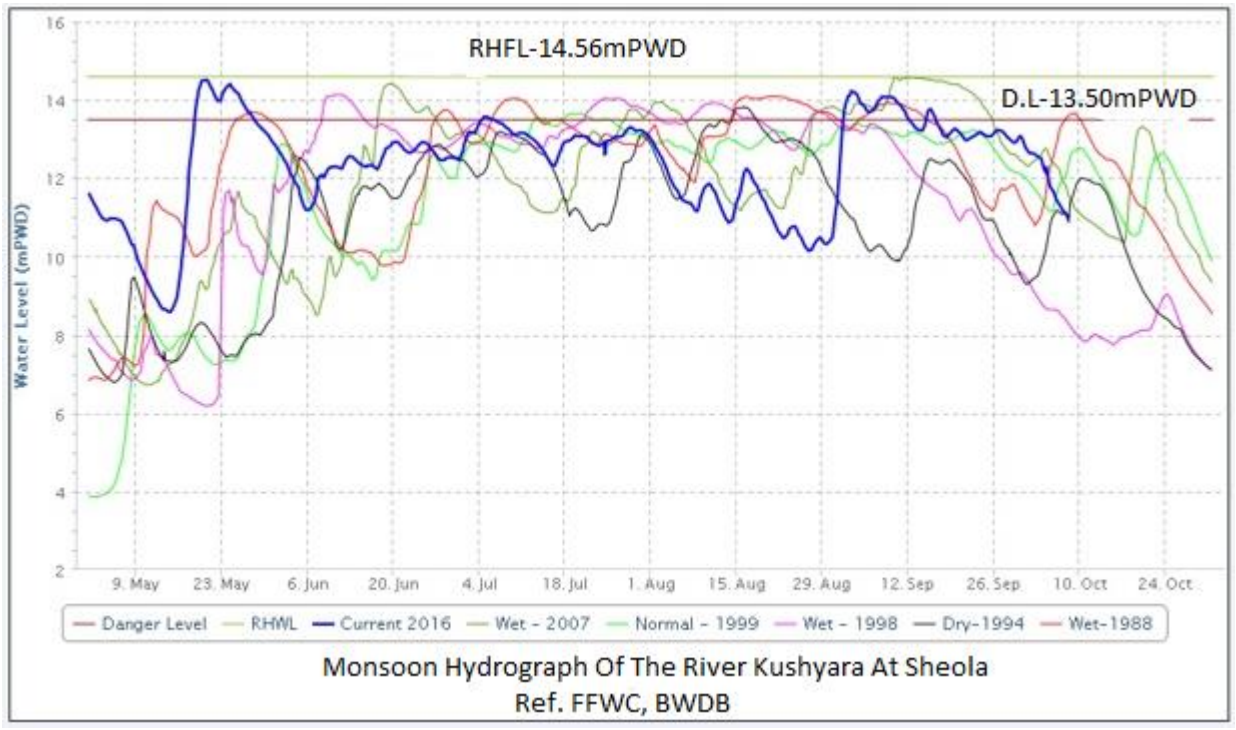
Data Type	Station Name	Station ID	Year of Availability	Source
Water Level	Sheola	SW173	1969 to 2016	BWDB
Discharge	Sheola	SW173	1950 to 2016	BWDB

Figure H.1 Location Map of Sheola on the Kushyara River

Analysis of Data

The collected hydrological data of Sheola on the Kushyara River has been used for the frequency analysis. The monsoon W.L hydrograph is shown in Figure H.2

Figure H.2 The Monsoon W.L Hydrograph of Kushyara at Sheola



The above is representative water level hydrograph for Sheola on the River Kushyara developed by FFWC, BWDB for the year 2016(having highest ever recorded water level), 1988, 1998 and 2007 (three remarkable wet season), 1994 (a dry season0 and 1999 9a normal season). This gives an understanding of the water level profile of the River Kushyara at Sheola.

Frequency Analysis

Frequency analysis for extreme W.L of Sheola has been performed using HYMOS tool a hydrological analytical tool developed by DHI, The Netherlands. Three different probability distributions (Gumbel-EV1, Log Pearson-3 and Log Normal) have been used to find the best fit one for the dataset of Kushyara River, and finally Log Pearson-3 has been chosen. **Figure. H3 to Figure H5** present the plots of the three distributions. **TableH.2** shows the probable Water levels of the Kushyara River at Sheola Station for three distribution methods.

Figure H3: Gumbel-EV1 Probability Plots Distribution

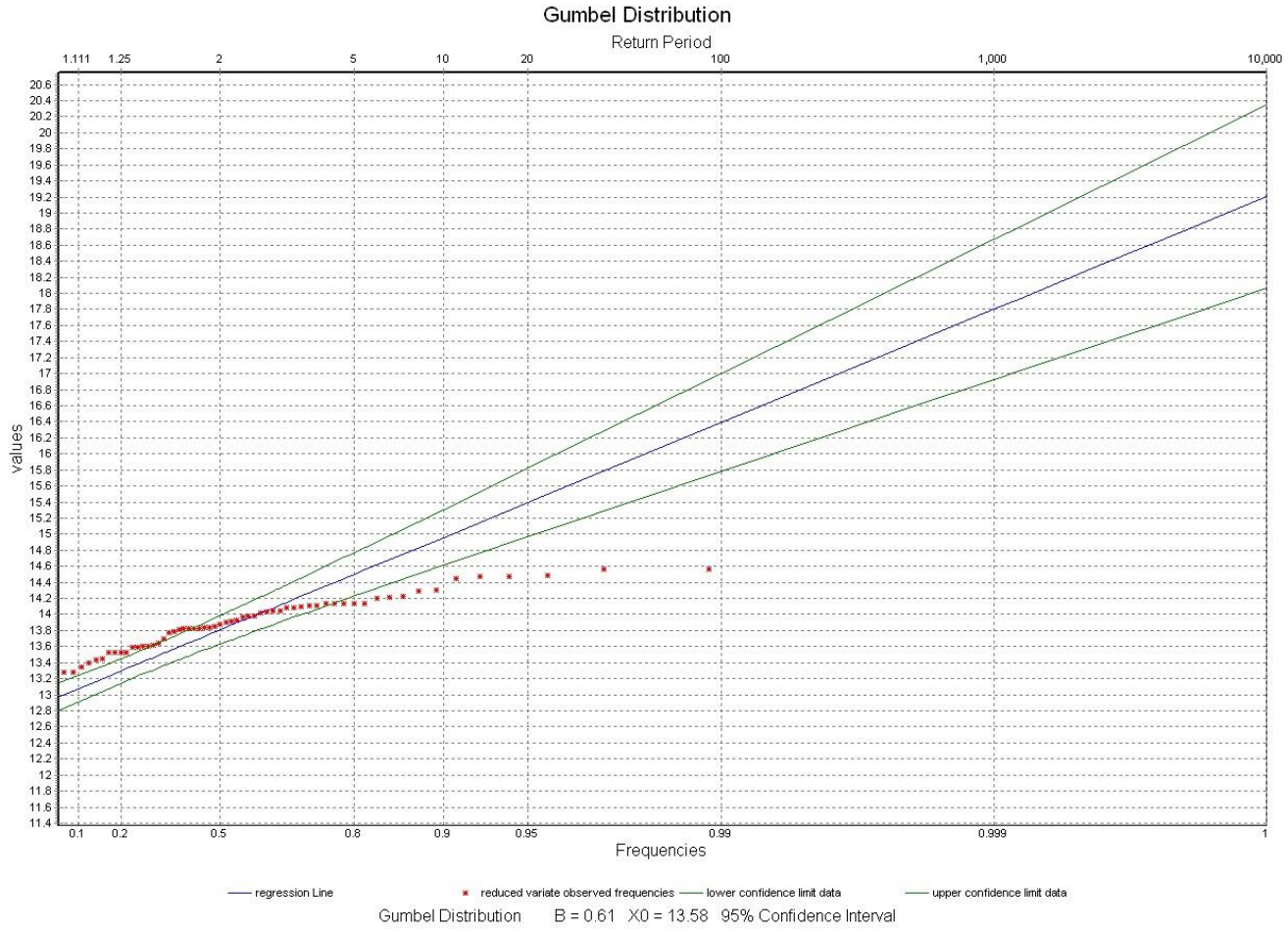


Figure H4: Log Pearson-3 Probability Plots Distribution

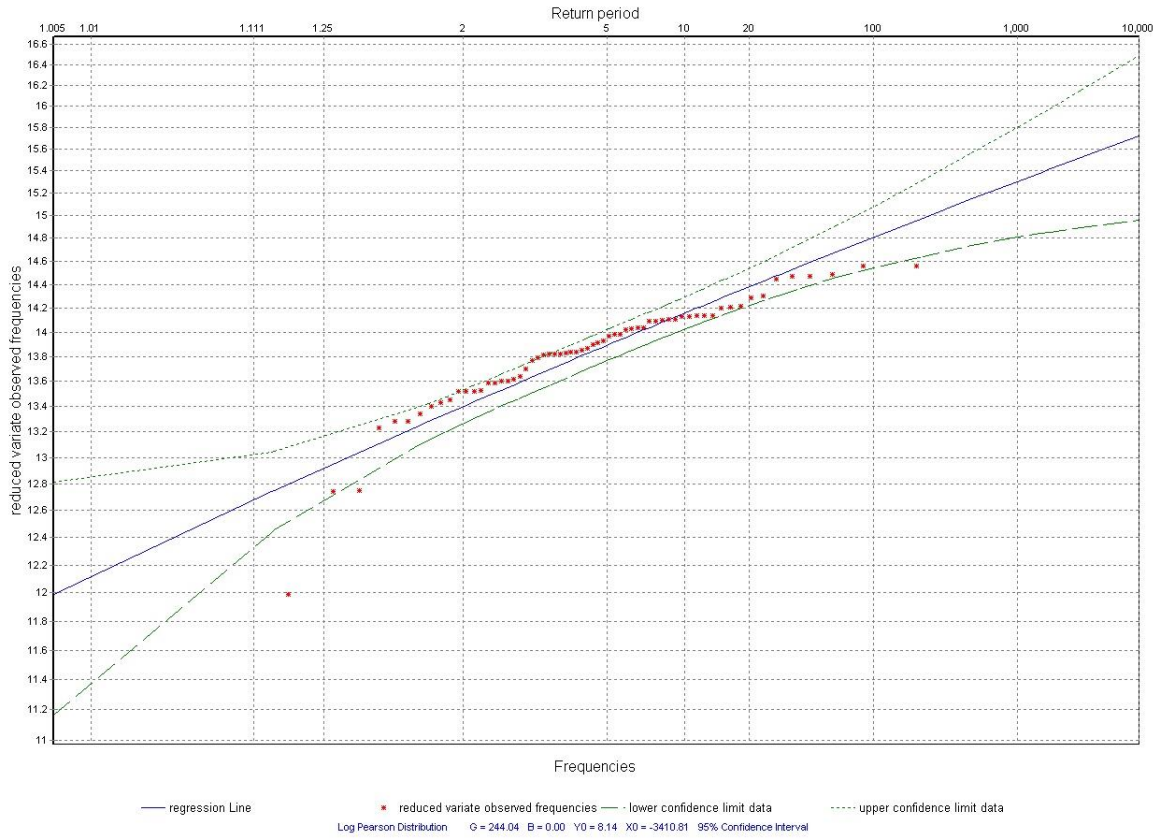


Figure H5:Log Normal Probability Plots Distribution

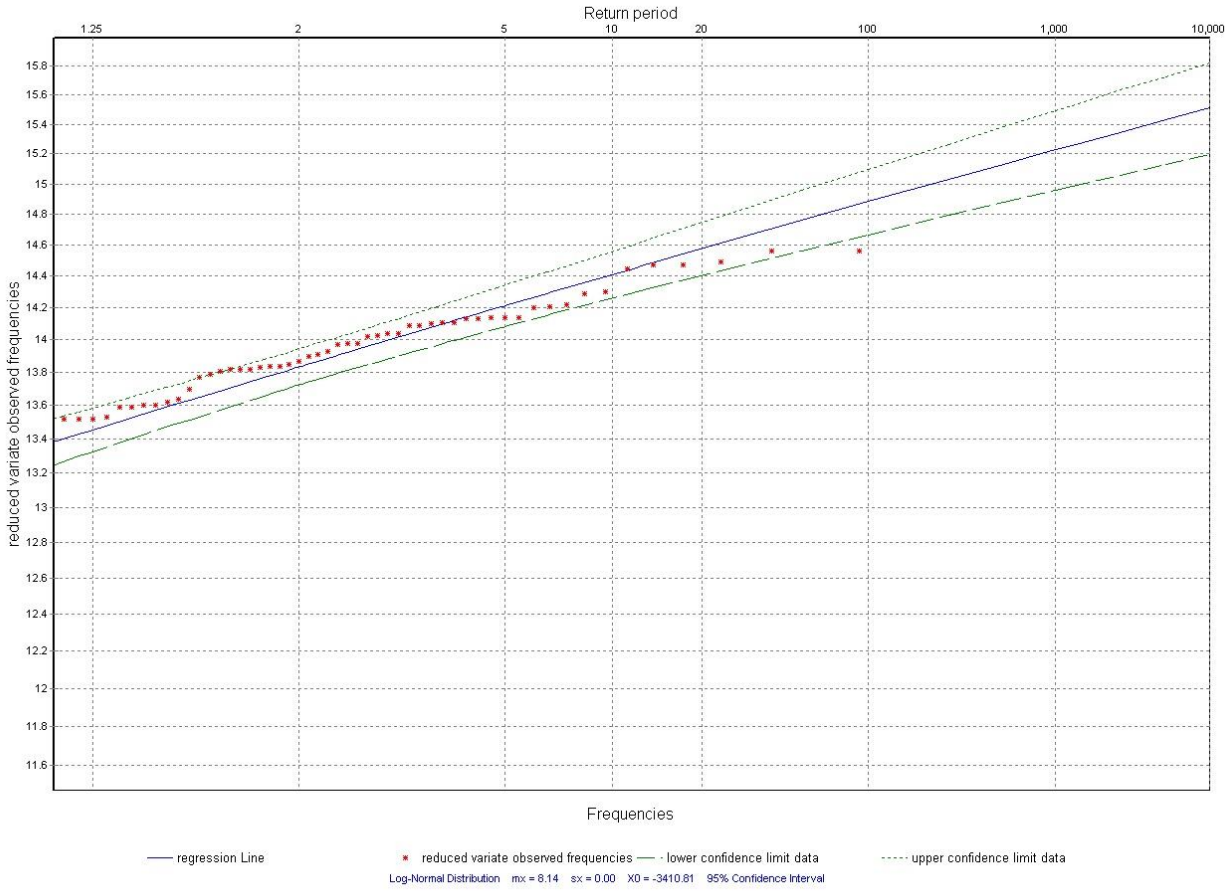


Table H.2 Probable Water levels of the Kushyara River at Sheola Station for three distribution methods

Probability Distribution		Return Period in year					
	2	5	10	25	50	100	
Gumbel (EV1)	13.808	14.500	14.958	15.537	15.966	16.392	
Log Pearson-3	13.825	14.229	14.446	14.682	14.838	14.979	
Log Normal	13.835	14.214	14.412	14.624	14.761	14.884	

To select the best fit among the three distributions Chi square test and Kolmogprov-Smirnov (K-S) test is done. **Table H.3** shows the Chi-square and K-S test results.

Table H.3 Chi square and K-S test results

Test	Gumbel Distribution	Log-Pearson Distribution	Log-Normal Distribution
K-S Test	0.0292	0.3011	0.3972
Chi Square Test	0.0000	0.0337	0.2190

It is evident that Gumbel (EV1) distribution does not fit in this case. From **Table H.3** it is seen that Chi Square is minimum for Log-Pearson Distribution. Again we know that if Chi Square is equal to zero the theoretical and observed frequencies agree exactly; while if Chi Square is greater than zero they do not agree exactly and the larger the value of Chi Square the greater is the discrepancy between the observed and expected frequencies. K-S test result is minimum for Gumble distribution. From visual inspection of probability plots and the Chi Square and K-S test result, Log-Normal distribution was considered to fit the best among the three distributions.

So, considering the 100 years Return period the flood level would be 14.884 mPWD. For planning and designing or establishing a project to withstand against 100 years returned period the R.L for the project should be provided at 14.884 + 1 (free board) + 0.5 (for anticipating climate change effect) =16.384 mPWD.

ANNEX 2: Environmental Screening Checklist of Proposed Sheola Land Port

Screening Questions	**Yes / No /? . Briefly describe**	**Is this likely to result in a significant effect? Yes/No/? – Why?**
1. Will construction, operation or decommissioning of the Project involve actions which will cause physical changes in the locality (topography, land use, changes in water bodies, etc.)?	Yes, the proposed land is a flood plain land and extensive borrow material will be required for filling up the land to above the flood level.	Yes, the drainage pattern will be changed due to filling up of floodplain land
2. Will construction or operation of the Project use natural resources such as land, water, materials or energy, especially any resources which are non-renewable or in short supply?	Yes. Borrow material would be required for developing the land. Petroleum products will be required for both construction (construction equipment) and operation of land ports.	Yes, due to extensive land filling and construction activities are involved.
3. Will the Project involve use, storage, transport, handling or production of substances or materials which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health?	Yes. Petroleum products may need to be stored at the port facilities for the operation of standby generators.	No, since closed storage yards will be developed for storing of petroleum and other hazardous cargo.
4. Will the Project produce solid wastes during construction or operation or decommissioning?	Yes. Both solid and liquid waste will be produced by the land port during construction (construction related waste) and operation (cargo waste).	Yes. Solid waste will be generated at the land port. Proper collection and disposal of solid waste will be required.
5. Will the Project release pollutants or any hazardous, toxic or noxious substances to air?	Yes. Dust and emissions from construction equipment and vehicular traffic will be a concern both during construction and operation.	No, dust control measures will be adopted in the design (e.g. paved roads) and will be regularly maintained (e.g. regular sweeping or water spraying).
6. Will the Project cause noise and vibration or release of light, heat energy or electromagnetic radiation?	Yes. Construction and operation works generate noise levels from machinery and traffic	No, adequate buffer zone will be established around the port facilities to control the noise levels.
7. Will the Project lead to risks of contamination of land or water from releases of pollutants onto the ground or into surface waters, groundwater, coastal wasters or the sea?	Yes. There is a risk of contamination from construction; and also from port facilities and cargo storages.	Yes, the risk contamination is more due to changes in the drainage pattern in the project area.
8. Will there be any risk of accidents during construction or operation of the Project which could affect human health or the environment?	Yes. Construction works may pose health and safety hazards to the workers and nearby community. During operation, major sources are dust and emissions from with activities associated with land ports and related facilities and traffic.	Yes. There are risks of physical hazards (cargo handling and use) and chemical hazards (dust and emissions form fuels. There are also risks of safety hazards due to non-use of personal protective equipment (e.g. safety shoes and helmets) during manual handling of cargo. Safe drinking and sanitation

Screening Questions	Yes / No /? . Briefly describe	Is this likely to result in a significant effect? Yes/No/? – Why?
		facilities are to be provided for both the office staff and working labourers.
9. Will the Project result in social changes, for example, in demography, traditional lifestyles, employment?	Yes. The project will generate employment opportunities for the local community both during construction and operation phases. The local communities are indigenous people and their life style could be impacted by increasing of their exposure to outside communities.	Yes, several employment opportunities will be generated in and around the port facilities, and in the associated industries.
10. Are there any other factors which should be considered such as consequential development which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality?	Yes. The existing 45 km road from Sylhet to the Sheola need to be strengthened and widened.	No, the road is passing through modified area of agricultural lands and settlements.
11. Are there any areas on or around the location which are protected under international or national or local legislation for their ecological, landscape, cultural or other value, which could be affected by the project?	No. The proposed facilities for extension are located in a human disturbed land. No areas that are protected under international and national legislation are located around the port facilities.	No.
12. Are there any other areas on or around the location which are important or sensitive for reasons of their ecology e.g. wetlands, watercourses or other waterbodies, the coastal zone, mountains, forests or woodlands, which could be affected by the project?	Yes, an haour (inland drainage basin) is located about 3 km south of the proposed port facility	No
13. Are there any areas on or around the location which are used by protected, important or sensitive species of fauna or flora e.g. for breeding, nesting, foraging, resting, overwintering, migration, which could be affected by the project?	No.	No
14. Are there any inland, coastal, marine or underground waters on or around the location which could be affected by the project?	Yes, the nearby rainwater drain and shallow groundwater could be affected by the Project	Yes, the water quality of the river and groundwater could be affected by the discharges from the proposed port facilities
15. Are there any areas or features of high landscape or scenic value on or around the location which could be affected by the project?	No	No
16. Are there any routes or facilities	No	No

Screening Questions	Yes / No /? . Briefly describe	Is this likely to result in a significant effect? Yes/No/? – Why?
on or around the location which are used by the public for access to recreation or other facilities, which could be affected by the project?		
17. Are there any transport routes on or around the location which are susceptible to congestion or which cause environmental problems, which could be affected by the project?	Yes, the road leading to the border is susceptible to traffic congestion.	No
18. Is the project in a location where it is likely to be highly visible to many people?	No, the facilities will be located in a rural setting	No
19. Are there any areas or features of historic or cultural importance on or around the location which could be affected by the project?	No.	No.
20. Is the project located in a previously undeveloped area where there will be loss of greenfield land?	Yes, the proposed facilities are located in a floodplain land which was previously underdeveloped	Yes, the drainage pattern would be affected if adequate drainage measures were not taken in the design
21. Are there existing land uses on or around the location e.g. homes, gardens, other private property, industry, commerce, recreation, public open space, community facilities, agriculture, forestry, tourism, mining or quarrying which could be affected by the project?	Yes, there are few houses located closed to the proposed port	No
22. Are there any plans for future land uses on or around the location which could be affected by the project?	No.	Yes, Proper land use planning and zoning is required around the proposed land port to address unplanned commercial development.
23. Are there any areas on or around the location which are densely populated or built-up, which could be affected by the project?	No	No
24. Are there any areas on or around the location which are occupied by sensitive land uses e.g. hospitals, schools, places of worship, community facilities, which could be affected by the project?	No	No
25. Are there any areas on or around the location which contain important, high quality or scarce resources e.g. groundwater, surface waters, forestry, agriculture, fisheries, tourism, minerals, which could be affected by the project?	No.	No.
26. Are there any areas on or around the location which are already subject to pollution or	No	No.

Screening Questions	Yes / No /? . Briefly describe	Is this likely to result in a significant effect? Yes/No/? – Why?
environmental damage e.g. where existing legal environmental standards are exceeded, which could be affected by the project?		
27. Is the project location susceptible to earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions e.g. temperature inversions, fogs, severe winds, which could cause the project to present environmental problems?	Yes, risk of earth quake is a concern in the Project area.	No, the design of port facilities will consider adequate building standards.

ANNEX 3: Environmental Code of Practices

ECoP 1: Waste Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
General Waste	Soil and water pollution from the improper management of wastes and excess materials from the construction sites.	The Contractor shall • Develop waste management plan for various specific waste streams (e.g., reusable waste, flammable waste, construction debris, food waste etc.) prior to commencing of construction and submit to CSC for approval. • Organize disposal of all wastes generated during construction in an environmentally acceptable manner. This will include consideration of the nature and location of disposal site, so as to cause less environmental impact. • Minimize the production of waste materials by 3R (Reduce, Recycle and Reuse) approach. • Segregate and reuse or recycle all the wastes, wherever practical. • Prohibit burning of solid waste • Collect and transport non-hazardous wastes to all the approved disposal sites. Vehicles transporting solid waste shall be covered with tarps or nets to prevent spilling waste along the route • Train and instruct all personnel in waste management practices and procedures as a component of the environmental induction process. • Provide refuse containers at each worksite. • Request suppliers to minimize packaging where practicable. • Place a high emphasis on good housekeeping practices. • Maintain all construction sites in a clean, tidy and safe condition and provide and maintain appropriate facilities as temporary storage of all wastes before transportation and final disposal.
Hazardous Waste	Health hazards and environmental impacts due to improper waste management practices	The Contractor shall • Collect chemical wastes in 200 liter drums (or similar sealed container), appropriately labeled for safe transport to an approved chemical waste depot. • Store, transport and handle all chemicals avoiding potential environmental pollution. • Store all hazardous wastes appropriately in bounded areas away from water courses. • Make available Material Safety Data Sheets (MSDS) for hazardous materials on-site during construction. • Collect hydrocarbon wastes, including lube oils, for safe transport off-site for reuse, recycling, treatment or disposal at approved locations. • Construct concrete or other impermeable flooring to prevent seepage in case of spills

ECoP 2: Fuels and Hazardous Goods Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Fuels and hazardous goods.	Materials used in construction have a potential to be a source of contamination. Improper storage and handling of fuels, lubricants, chemicals and hazardous goods/materials on-site, and potential spills from these goods may harm the environment or health of construction workers.	The Contractor shall • Prepare spill control procedures and submit the plan for CSC approval. • Train the relevant construction personnel in handling of fuels and spill control procedures. • Store dangerous goods in bounded area on a top of a sealed plastic sheet away from watercourses. • Refueling shall occur only within bounded area. • Make available MSDS for chemicals and dangerous goods on-site. • Transport waste of dangerous goods, which cannot be recycled, to a designated disposal site approved by DoE. • Provide absorbent and containment material (e.g., absorbent matting) where hazardous material are used and stored. • Provide protective clothing, safety boots, helmets, masks, gloves, and goggles to the construction personnel which are appropriate to materials in use. • Make sure all containers, drums, and tanks that are used for storage are in good condition and are labeled with expiry date. Any container, drum, or tank that is dented, cracked, or rusted might eventually leak Check for leakage regularly to identify potential problems before they occur. • Store hazardous materials above flood plain level. • Put containers and drums in temporary storages in clearly marked areas, where they will not be run over by vehicles or heavy machinery. The area shall preferably slope or drain to a safe collection area in the event of a spill. • Put containers and drums in permanent storage areas with an impermeable floor that slopes to a safe collection area in the event of a spill or leak. • Take all precautionary measures when handling and storing fuels and lubricants, avoiding environmental pollution. • Avoid the use of material with greater potential for contamination by substituting them with more environment friendly materials. • Return the gas cylinders to the supplier. However, if they are not empty prior to their return, they must be labeled with the name of the material they contained or contain, information of the supplier, cylinder serial number, pressure, their last hydrostatic test date, and any additional identification marking that may be considered necessary.

ECoP 3: Water Resources Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Hazardous Material and Waste	Water pollution from the storage, handling and disposal of hazardous materials and general construction waste, and accidental spillage	The Contractor shall • Follow the management guidelines proposed in ECPs 1 and 2. • Minimize the generation of sediment, oil and grease, excess nutrients, organic matter, litter, debris and any form of waste (particularly petroleum and chemical wastes). These substances must not enter waterways, storm water systems or underground water tables
Discharge from construction sites	During construction both surface and groundwater quality may be deteriorated due to construction activities in the river, sewerages from construction sites and work camps. The construction works will modify groundcover and topography changing the surface water drainage patterns of the area including infiltration and storage of storm water. These changes in hydrological regime lead to increased rate of runoff, increase in sediment and contaminant loading, increased flooding, groundwater contamination, and effect habitat of fish and other aquatic biology.	The Contractor shall • Install temporary drainage works (channels and bunds) in areas required for sediment controlerosion control and around storage areas for construction materials • Install temporary sediment basins, where appropriate, to capture sediment-laden run-off from site • Divert runoff from undisturbed areas around the construction site • Stockpile materials away from drainage lines • Prevent all solid and liquid wastes entering waterways by collecting solid waste, oils, chemicals, bitumen spray waste and wastewaters from brick, concrete and asphalt cutting where possible and transport to an approved waste disposal site or recycling depot • Wash out ready-mix concrete agitators and concrete handling equipment at washing facilities off site or into approved bounded areas on site. Ensure that tires of construction vehicles are cleaned in the washing bay (constructed at the entrance of the construction site) to remove the mud from the wheels. This shall be done in every exit of each construction vehicle to ensure the local roads are kept clean.
Soil Erosion and siltation	Soil erosion and dust from the material stockpiles will increase the sediment and contaminant loading of surface water bodies.	The Contractor shall • Stabilize the cleared areas not used for construction activities with vegetation or appropriate surface water treatments as soon as practicable following earthwork to minimize erosion • Ensure that roads used by construction vehicles are swept regularly to remove sediment. • Water the material stockpiles, access roads and bare soils on an required basis to minimize dust. Increase the watering frequency during periods of high risk (e.g. high winds)
Construction activities in water bodies	Construction works in the water bodies will increase sediment and contaminant loading, and effect habitat of fish and other aquatic biology.	The Contractor Shall • Dewater sites by pumping water to a sediment basin prior to release off site – do not pump directly off site • Protect water bodies from sediment loads by silt screen or bubble curtains or other barriers • Minimize the generation of sediment, oil and

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		grease, excess nutrients, organic matter, litter, debris and any form of waste (particularly petroleum and chemical wastes). These substances must not enter waterways, storm water systems or underground water tables. • Use environment friendly and nontoxic slurry during construction of piles to discharge into the river. • Reduce infiltration of contaminated drainage through storm water management design • Do not discharge cement and water curing used for cement concrete directly into water courses and drainage inlets.
Drinking water	Groundwater at shallow depths is contaminated with arsenic and hence not suitable for drinking purposes.	The Contractor Shall • Pumping of groundwater shall be from deep aquifers of more than 300 m to supply arsenic free water. Safe and sustainable discharges are to be ascertained prior to selection of pumps. • Tube wells will be installed with due regard for the surface environment, protection of groundwater from surface contaminants, and protection of aquifer cross contamination • All tube wells, test holes, monitoring wells that are no longer in use or needed shall be properly decommissioned
	Depletion and pollution of groundwater resources	• Install monitoring wells both upstream and downstream areas near construction yards and construction camps to regularly monitor the water quality and water levels. • Protect groundwater supplies of adjacent lands

ECoP 4: Drainage Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Excavation and earth works, and construction yards	Lack of proper drainage for rainwater/liquid waste or wastewater owing to the construction activities harms environment in terms of water and soil contamination, and mosquito growth.	The Contractor shall • Prepare a program for preventing/avoid standing waters, which CSC will verify in advance and confirm during implementation • Provide alternative drainage for rainwater if the construction works/earth-fillings cut the established drainage line • Establish local drainage line with appropriate silt collector and silt screen for rainwater or wastewater connecting to the existing established drainage lines already there • Rehabilitate road drainage structures immediately if damaged by contractors' road transports. • Build new drainage lines as appropriate and required for wastewater from construction yards connecting to the available nearby recipient water bodies. Ensure wastewater quality conforms to the relevant standards provided by DoE, before it is

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		being discharged into the recipient water bodies. • Ensure the internal roads/hard surfaces in the construction yards/construction camps that generate storm water drainage to accommodate high runoff during downpour and that there is no stagnant water in the area at the end of the downpour. • Construct wide drains instead of deep drains to avoid sand deposition in the drains that require frequent cleaning. • Provide appropriate silt collector and silt screen at the inlet and manholes and periodically clean the drainage system to avoid drainage congestion • Protect natural slopes of drainage channels to ensure adequate storm water drains. • Regularly inspect and maintain all drainage channels to assess and alleviate any drainage congestion problem. • Reduce infiltration of contaminated drainage through storm water management design
Ponding of water	Health hazards due to mosquito breeding	• Do not allow ponding of water especially near the waste storage areas and construction camps • Discard all the storage containers that are capable of storing of water, after use or store them in inverted position

ECoP 5: Soil Quality Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Filling of Sites with soil	Soil contamination will occur from filled material	The Contractor shall • Fill the land in dry season • If transported by truck then Cover the soil by tipple of the truck during transportation • Spray of water is suggested in the construction sites • Ensure that filled soil used for land filling shall be free of pollutants. Prior to filling, soil quality shall be tested to confirm whether soil is pollution free. Soil shall be properly compacted. Side Slope of Filled Land of 1:2 shall be constructed by suitable soils with proper compaction as per design. Slope surface shall be covered by top soils/ cladding materials (0.5m thick) and grass turfing with suitable grass. • No sediment laden water in the adjacent lands near the construction sites, and/or wastewater of suspended materials excessive of 200mg/l from soil storage/use area in the adjacent agricultural lands.
Storage of hazardous and toxic chemicals	Spillage of hazardous and toxic chemicals will contaminate the soils	The Contractor shall • Strictly manage the wastes management plans proposed in ECP1 and storage of materials in ECP2 • Construct appropriate spill contaminant facilities for all fuel storage areas • Establish and maintain a hazardous materials register detailing the location and quantities of hazardous substances including the storage, use of disposals • Train personnel and implement safe work

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		practices for minimizing the risk of spillage • Identify the cause of contamination, if it is reported, and contain the area of contamination. The impact may be contained by isolating the source or implementing controls around the affected site • Remediate the contaminated land using the most appropriate available method to achieve required commercial/industrial guideline validation results
Construction material stock piles	Erosion from construction material stockpiles may contaminate the soils	The Contractor shall • Protect the toe of all stockpiles, where erosion is likely to occur, with silt fences, straw bales or bunds

ECoP 6: Erosion and Sediment Control

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Clearing of construction sites	Cleared areas and slopes are susceptible to erosion of top soils, that affects the growth of vegetation which causes ecological imbalance.	• Reinstate and protect cleared areas as soon as possible. • Mulch to protect batter slopes before planting • Cover unused area of disturbed or exposed surfaces immediately with mulch/grass turfings/tree plantations
Construction activities and material stockpiles	The impact of soil erosion are (i) Increased run off and sedimentation causing a greater flood hazard to the downstream, (ii) destruction of aquatic environment in nearby lakes, streams, and reservoirs caused by erosion and/or deposition of sediment damaging the spawning grounds of fish, and (iii) destruction of vegetation by burying or gullying.	The Contractor shall • Locate stockpiles away from drainage lines • Protect the toe of all stockpiles, where erosion is likely to occur, with silt fences, straw bales or bunds • Remove debris from drainage paths and sediment control structures • Cover the loose sediments and water them if required • Divert natural runoff around construction areas prior to any site disturbance • Install protective measures on site prior to construction, for example, sediment traps • Control drainage through a site in protected channels or slope drains • Install ‘cut off drains’ on large cut/fill batter slopes to control water runoff speed and hence erosion • Observe the performance of drainage structures and erosion controls during rain and modify as required.

ECoP 7: Top Soil Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Land clearing and earth works	Earthworks will impact the fertile top soils that are enriched with nutrients required for plant growth or agricultural development.	The Contractor shall • Strip the top soil to a depth of 15 cm and store in stock piles of height not exceeding 2m. • Remove unwanted materials from top soil like grass, roots of trees and similar others. • The stockpiles will be done in slopes of 2:1 to reduce surface runoff and enhance percolation through the mass of stored soil. • Locate topsoil stockpiles in areas outside drainage lines and protect from erosion. • Construct diversion channels and silt fences around the topsoil stockpiles to prevent erosion and loss of topsoil. • Spread the topsoil to maintain the physico-chemical and biological activity of the soil. The stored top soil will be utilized for covering all disturbed area and along the proposed plantation sites • Prior to the re-spreading of topsoil, the ground surface will be ripped to assist the bonding of the soil layers, water penetration and revegetation
Transport	Vehicular movement outside ROW or temporary access roads will affect the soil fertility of the agricultural lands	• Limit equipment and vehicular movements to within the approved construction zone • Construct temporary access tracks to cross concentrated water flow lines at right angles • Plan construction access to make use, if possible, of the final road alignment • Use vehicle-cleaning devices, for example, ramps or wash down areas

ECoP 8: Topography and Landscaping

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Land clearing and earth works	Flood plains of the existing Project area will be affected by the construction of various project activities. Construction activities especially earthworks will change topography and disturb the natural rainwater/flood water drainage as well as change the local landscape.	The Contractor shall • Ensure the topography of the final surface of all raised lands (construction yards, approach roads, access roads, bridge end facilities, etc.) are conducive to enhance natural draining of rainwater/flood water; • Keep the final or finished surface of all the raised lands free from any kind of depression that insists water logging • Undertake mitigation measures for erosion control/prevention by grass-turfing and tree plantation, where there is a possibility of rain-cut that will change the shape of topography. • Cover immediately the uncovered open surface that has no use of construction activities with grass-cover and tree plantation to prevent soil erosion and bring improved landscaping

ECoP 9: Borrow Areas Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Development and operation of borrow areas	Borrow areas will have impacts on local topography, landscaping and natural drainage.	The Contractor shall • Use only approved quarry and borrow sites • Not use agriculture areas or ecologically sensitive areas as borrow sites • Identify new borrow and quarry areas in consultation with Project Director, if required. • Reuse excavated or disposed material available in the project to the maximum extent possible. • Store top soil for reinstatement and landscaping. • Develop surface water collection and drainage systems, anti-erosion measures (berms, revegetation etc.) and retaining walls and gabions where required. Implement mitigation measures in ECoP 3: Water Resources Management, ECoP 6: Erosion and Sediment Control • The use of explosive should be used in as less in quantity as possible to reduce noise, vibration and dust. • Control dust and air quality deterioration by application of watering and implementing mitigation measures proposed in ECoP 10: Air Quality Management • Noise and vibration control by ECoP 11: Noise and Vibration Management.
Soil placement at temporary locations prior to shifting or direct placement on the proposed site for filling	Dispersion of sediments and release of high sediment laden runoff from the placement sites.	The Contractor • To the extent possible, shall directly place the soil for filling the proposed disposal areas. Prior to filling commencing, the areas being filled will be subdivided into compartments by construction of temporary containment bunds of suitable material.

ECoP 10: Air Quality Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction vehicular traffic	Air quality can be adversely affected by vehicle exhaust emissions and combustion of fuels.	The Contractor shall • Fit vehicles with appropriate exhaust systems and emission control devices. Maintain these devices in good working condition. • Operate the vehicles in a fuel efficient manner • Cover haul vehicles carrying dusty materials moving outside the construction site • Impose speed limits on all vehicle movement at the worksite to reduce dust emissions • Control the movement of construction traffic • Water construction materials prior to loading and transport • Service all vehicles regularly to minimize emissions • Limit the idling time of vehicles not more than 2 minutes

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction machinery	Air quality can be adversely affected by emissions from machinery and combustion of fuels.	The Contractor shall • Fit machinery with appropriate exhaust systems and emission control devices. Maintain these devices in good working condition in accordance with the specifications defined by their manufacturers to maximize combustion efficiency and minimize the contaminant emissions. Proof or maintenance register shall be required by the equipment suppliers and contractors/subcontractors • Focus special attention on containing the emissions from generators • Machinery causing excess pollution (e.g. visible smoke) will be banned from construction sites Service all equipment regularly to minimize emissions • Provide filtering systems, duct collectors or humidification or other techniques (as applicable) to the concrete batching and mixing plant to control the particle emissions in all its stages, including unloading, collection, aggregate handling, cement dumping, circulation of trucks and machinery inside the installations
Construction activities	Dust generation from construction sites, material stockpiles and access roads is a nuisance in the environment and can be a health hazard.	• Water the material stockpiles, access roads and bare soils on an as required basis to minimize the potential for environmental nuisance due to dust. Increase the watering frequency during periods of high risk (e.g. high winds). Stored materials such as gravel and sand shall be covered and confined to avoid their being wind-drifted • Minimize the extent and period of exposure of the bare surfaces • Reschedule earthwork activities or vegetation clearing activities, where practical, if necessary to avoid during periods of high wind and if visible dust is blowing off-site • Restore disturbed areas as soon as possible by vegetation/grass-turfing • Store the cement in silos and minimize the emissions from silos by equipping them with filters. • Establish adequate locations for storage, mixing and loading of construction materials, in a way that dust dispersion is prevented because of such operations • Crushing of rocky and aggregate materials shall be wet-crushed, or performed with particle emission control systems

ECoP 11: Noise and Vibration Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction vehicular traffic	Noise quality will be deteriorated due to vehicular traffic	The Contractor shall • Maintain all vehicles in order to keep it in good working order in accordance with manufactures maintenance procedures • Make sure all drivers will comply with the traffic codes concerning maximum speed limit, driving hours, etc. • Organize the loading and unloading of trucks, and handling operations for the purpose of minimizing construction noise on the work site
Construction machinery	Noise and vibration may have an impact on people, property, fauna, livestock and the natural environment.	The Contractor shall • Appropriately site all noise generating activities to avoid noise pollution to local residents • Use the quietest available plant and equipment • Modify equipment to reduce noise (for example, noise control kits, lining of truck trays or pipelines) • Maintain all equipment in order to keep it in good working order in accordance with manufactures maintenance procedures. Equipment suppliers and contractors shall present proof of maintenance register of their equipment. • Install acoustic enclosures around generators to reduce noise levels. • Fit high efficiency mufflers to appropriate construction equipment • Avoid the unnecessary use of alarms, horns and sirens
Construction activity	Noise and vibration may have an impact on people, property, fauna, livestock and the natural environment.	The Contractor shall • Notify adjacent landholders prior any typical noise events outside of daylight hours • Educate the operators of construction equipment on potential noise problems and the techniques to minimize noise emissions • Employ best available work practices on-site to minimize occupational noise levels • Install temporary noise control barriers where appropriate • Notify affected people if major noisy activities will be undertaken, e.g. pile driving • Plan activities on site and deliveries to and from site to minimize impact • Monitor and analyze noise and vibration results and adjust construction practices as required. • Avoid undertaking the noisiest activities, where possible, when working at night near the residential areas

ECoP 12: Protection of Flora

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Vegetation clearance	Local flora are important to provide shelters for the birds, offer fruits and/or timber/fire wood, protect soil erosion and overall keep the environment very friendly to human-living. As such damage to flora has wide range of adverse environmental impacts.	The Contractor shall • Reduce disturbance to surrounding vegetation • Use appropriate type and minimum size of machine to avoid disturbance to adjacent vegetation. • Get approval from supervision consultant for clearance of vegetation. • Make selective and careful pruning of trees where possible to reduce need of tree removal. • Control noxious weeds by disposing of at designated dump site or burn on site. • Clear only the vegetation that needs to be cleared in accordance with the plans. These measures are applicable to both the construction areas as well as to any associated activities such as sites for stockpiles, disposal of fill and construction of diversion roads, etc. • Do not burn off cleared vegetation – where feasible, chip or mulch and reuse it for the rehabilitation of affected areas, temporary access tracks or landscaping. Mulch provides a seed source, can limit embankment erosion, retains soil moisture and nutrients, and encourages re-growth and protection from weeds. • Return topsoil and mulched vegetation (in areas of native vegetation) to approximately the same area of the roadside it came from. • Avoid work within the drip-line of trees to prevent damage to the tree roots and compacting the soil. • Minimize the length of time the ground is exposed or excavation left open by clearing and re-vegetate the area at the earliest time possible. • Ensure excavation works occur progressively and re-vegetation done at the earliest • Provide adequate knowledge to the workers regarding nature protection and the need of avoiding trees felling during construction • Supply appropriate fuel in the work caps to prevent fuel wood collection

ECoP 13: Protection of Fauna

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction activities	The location of construction activities can result in the loss of wild life habitat and habitat quality,.	The Contractor shall • Limit the construction works within the designated sites allocated to the contractors • check the site for animals trapped in, or in danger from site works and use a qualified person to relocate the animal
	Impact on migratory birds, its habitat and its active nests	The Contractor shall • Not be permitted to destruct active nests or eggs of migratory birds • Minimize the tree removal during the bird breeding season. If works must be continued during the bird breeding season, a nest survey will be conducted by a qualified biologist prior to commence of works to identify and located active nests • Minimize the release of oil, oil wastes or any other substances harmful to migratory birds or water or any areas frequented by migratory birds.
Vegetation clearance	Clearance of vegetation may impact shelter, feeding and/or breeding and/or physical destruction and severing of habitat areas	The Contractor shall • Restrict the tree removal to the minimum required. • Retain tree hollows on site, or relocate hollows, where appropriate • Leave dead trees where possible as habitat for fauna • Fill the hollow bearing trees in a manner which reduces the potential for fauna mortality. Felled trees will be inspected after felling for fauna and if identified and readily accessible will be removed and relocated or rendered assistance if injured. After felling, hollow bearing trees will remain unmoved overnight to allow animals to move of their own volition.
Construction camps	Illegal poaching	• Provide adequate knowledge to the workers regarding protection of flora and fauna, and relevant government regulations and punishments for illegal poaching.

ECoP 14: Protection of Fisheries

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction activities in River	The main potential impacts to fisheries are hydrocarbon spills and leaks from riverine transport and disposal of wastes into the river	The Contractor shall • Ensure the riverine transports, vessels and ships are well maintained and do not have oil leakage to contaminate river water. • Contain oil immediately on river in case of accidental spillage from vessels and ships and in this regard, make an emergency oil spill containment plan to be supported with enough equipment, materials and human resources • Do not dump wastes, be it hazardous or non-hazardous into the nearby water bodies or in the river
Construction activities on the land	The main potential impacts to aquatic flora and fauna River are increased suspended solids from earthworks erosion, sanitary discharge from work camps, and hydrocarbon spills	The Contractor shall • follow mitigation measures proposed in ECoP 3 : Water Resources Management and EC4: Drainage Management
	Filling of ponds for site preparation will impact the fishes.	The Contractor shall • Inspect any area of a water body containing fish that is temporarily isolated for the presence of fish, and all fish shall be captured and released unharmed in adjacent fish habitat • Install and maintain fish screens etc. on any water intake with drawing water from any water body that contain fish

ECoP 15: Road Transport and Road Traffic Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction vehicular traffic	Increased traffic use of road by construction vehicles will affect the movement of normal road traffics and the safety of the road-users.	The Contractor shall • Prepare and submit a traffic management plan to the CSC for his approval at least 30 days before commencing work on any project component involved in traffic diversion and management. • Include in the traffic management plan to ensure uninterrupted traffic movement during construction: detailed drawings of traffic arrangements showing all detours, temporary road, temporary bridges temporary diversions, necessary barricades, warning signs / lights, and road signs. • Provide signs at strategic locations of the roads complying with the schedules of signs contained in the Bangladesh Traffic Regulations. • Install and maintain a display board at each important road intersection on the roads to be used during construction, which shall clearly show the following information in Bangla: • Location: chainage and village name

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		• Duration of construction period • Period of proposed detour / alternative route • Suggested detour route map • Name and contact address/telephone number of the concerned personnel • Name and contact address / telephone number of the Contractor • Inconvenience is sincerely regretted.
	Accidents and spillage of fuels and chemicals	• Restrict truck deliveries, where practicable, to day time working hours. • Restrict the transport of oversize loads. • Operate road traffics/transport vehicles, if possible, to non-peak periods to minimize traffic disruptions. • Enforce on-site speed limit

ECoP 16: Construction Camp Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Siting and Location of construction camps	Campsites for construction workers are the important locations that have significant impacts such as health and safety hazards on local resources and infrastructure of nearby communities.	The Contractor shall • Locate the construction camps at areas which are acceptable from environmental, cultural or social point of view. • Consider the location of construction camps away from communities in order to avoid social conflict in using the natural resources such as water or to avoid the possible adverse impacts of the construction camps on the surrounding communities. • Submit to the CSC for approval a detailed layout plan for the development of the construction camp showing the relative locations of all temporary buildings and facilities that are to be constructed together with the location of site roads, fuel storage areas (for use in power supply generators), solid waste management and dumping locations, and drainage facilities, prior to the development of the construction camps. • Local authorities responsible for health, religious and security shall be duly informed on the set up of camp facilities so as to maintain effective surveillance over public health, social and security matters. • National laws on child labor will be strictly followed. No child labor will be hired by the contractors or subcontractors in any of the project activities. •
Construction Camp Facilities	Lack of proper infrastructure facilities , such as housing, water supply and sanitation facilities will increase pressure on the local services and generate substandard living	Contractor shall provide the following facilities in the campsites • Adequate housing for all workers • Safe and reliable water supply. Water supply from deep tube wells of 300 m depth that meets the national standards • Hygienic sanitary facilities and sewerage system. The toilets and domestic waste water will be collected

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
	standards and health hazards.	through a common sewerage. Provide separate latrines and bathing places for males and females with total isolation by wall or by location. The minimum number of toilet facilities required is one toilet for every ten persons. • Treatment facilities for sewerage of toilet and domestic wastes • Storm water drainage facilities. Both sides of roads are to be provided with shallow v drains to drain off storm water to a silt retention pond which shall be sized to provide a minimum of 20 minutes retention of storm water flow from the whole site. Channel all discharge from the silt retention pond to natural drainage via a grassed swale at least 20 meters in length with suitable longitudinal gradient. • Paved internal roads. Ensure with grass/vegetation coverage to be made of the use of top soil that there is no dust generation from the loose/exposed sandy surface. Pave the internal roads with at least haring-bond bricks to suppress dusts and to work against possible muddy surface during monsoon. • Provide child crèches for women working construction site. The crèche shall have facilities for dormitory, kitchen, indoor and outdoor play area. Schools shall be attached to these crèches so that children are not deprived of education whose mothers are construction workers • Provide in-house community/common entertainment facilities. dependence of local entertainment outlets by the construction camps to be discouraged/prohibited to the extent possible.
Disposal of waste	Management of wastes is crucial to minimize impacts on the environment	The Contractor shall • Ensure proper collection and disposal of solid wastes within the construction camps • Insist waste separation by source; organic wastes in one pot and inorganic wastes in another pot at household level. • Store inorganic wastes in a safe place within the household and clear organic wastes on daily basis of waste collector. Establish waste collection, transportation and disposal systems with the manpower and equipments/vehicles needed. • Dispose organic wastes in a designated safe place on daily basis. At the end of the day cover the organic wastes with a thin layer of sand so that flies, mosquitoes, dogs, cats, rats, are not attracted. One may dig a large hole to put organic wastes in it; take care to protect groundwater from contamination by leachate formed due to decomposition of wastes. Cover the bed of the pit with impervious layer of materials (clayey or thin concrete) to protect groundwater from contamination. • Locate the garbage pit/waste disposal site min 500 m away from the residence so that people are not disturbed with the odor likely to be produced from anaerobic decomposition of wastes at the waste dumping places. Encompass the waste dumping

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		place by fencing and tree plantation to prevent children to enter and play with. • Do not establish site specific landfill sites. All solid waste will be collected and removed from the work camps and disposed in approval waste disposal sites.
Fuel supplies for cooking purposes	Illegal sourcing of fuel wood by construction workers will impact the natural flora and fauna	The Contractor shall • Provide fuel to the construction camps for their domestic purpose, in order to discourage them to use fuel wood or other biomass. • Made available alternative fuels like natural gas or kerosene on ration to the workforce to prevent them using biomass for cooking. • Conduct awareness campaigns to educate workers on preserving and protecting the biodiversity and wildlife of the project area, and relevant government regulations and punishments on wildlife protection.
Health and Hygiene	There will be a potential for diseases to be transmitted including malaria, exacerbated by inadequate health and safety practices. There will be an increased risk of work crews spreading sexually transmitted infections and HIV/AIDS.	The Contractor shall • Provide adequate health care facilities within construction sites. • Provide first aid facility round the clock. Maintain stock of medicines in the facility and appoint fulltime designated first aider or nurse. • Provide ambulance facility for the laborers during emergency to be transported to nearest hospitals. • Initial health screening of the laborers coming from outside areas • Train all construction workers in basic sanitation and health care issues and safety matters, and on the specific hazards of their work • Provide HIV awareness programming, including STI (sexually transmitted infections) and HIV information, education and communication for all workers on regular basis • Complement educational interventions with easy access to condoms at campsites as well as voluntary counseling and testing • Provide adequate drainage facilities throughout the camps to ensure that disease vectors such as stagnant water bodies and puddles do not form. Regular mosquito repellant sprays during monsoon. • Carryout short training sessions on best hygiene practices to be mandatorily participated by all workers. Place display boards at strategic locations within the camps containing messages on best hygienic practices
Safety	In adequate safety facilities to the construction camps may create security problems and fire hazards	The Contractor shall • Provide appropriate security personnel (police / home guard or private security guards) and enclosures to prevent unauthorized entry in to the camp area. • Maintain register to keep a track on a head count of persons present in the camp at any given time. • Encourage use of flameproof material for the construction of labor housing / site office. Also, ensure that these houses/rooms are of sound

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		construction and capable of withstanding wind storms/cyclones. • Provide appropriate type of firefighting equipments suitable for the construction camps • Display emergency contact numbers clearly and prominently at strategic places in camps. • Communicate the roles and responsibilities of laborers in case of emergency in the monthly meetings with contractors.
Site Restoration	Restoration of the construction camps to original condition requires demolition of construction camps.	The Contractor shall • Dismantle and remove from the site all facilities established within the construction camp including the perimeter fence and lockable gates at the completion of the construction work. • Dismantle camps in phases and as the work gets decreased and not wait for the entire work to be completed • Give prior notice to the laborers before demolishing their camps/units • Maintain the noise levels within the national standards during demolition activities • Different contractors shall be hired to demolish different structures to promote recycling or reuse of demolished material. • Reuse the demolition debris to a maximum extent. Dispose remaining debris at the designated waste disposal site. • Handover the construction camps with all built facilities as it is, agreement between both parties (contactor and land-owner) has been made so. • Restore the site to its condition prior to commencement of the works or to an agreed condition with the landowner. • Not make false promises to the laborers for future employment in O&M of the project.

ECoP 17: Cultural and Religious Issues

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction activities near religious and cultural sites	Disturbance from construction works to the cultural and religious sites, and contractors lack of knowledge on cultural issues cause social disturbances.	The Contractor shall • Communicate to the public through community consultation and newspaper announcements regarding the scope and schedule of construction, as well as certain construction activities causing disruptions or access restriction. • Do not block access to cultural and religious sites, wherever possible • Restrict all construction activities within the foot prints of the construction sites. • Stop construction works that produce noise (particularly during prayer time) shall there be any mosque/religious/educational institutions close to the construction sites and users make objections. • Take special care and use appropriate equipment when working next to a cultural/religious institution. • Stop work immediately and notify the site manager

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		if, during construction, an archaeological or burial site is discovered. It is an offence to recommence work in the vicinity of the site until approval to continue is given by the CSC/PMU. • Provide separate prayer facilities to the construction workers. • Show appropriate behavior with all construction workers especially women and elderly people • Allow the workers to participate in praying during construction time • Resolve cultural issues in consultation with local leaders and supervision consultants • Establish a mechanism that allows local people to raise grievances arising from the construction process. • Inform the local authorities responsible for health, religious and security duly informed before commencement of civil works so as to maintain effective surveillance over public health, social and security matters

ECoP 18: Worker Health and Safety

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Best practices	Construction works may pose health and safety risks to the construction workers and site visitors leading to severe injuries and deaths. The population in the proximity of the construction site and the construction workers will be exposed to a number of (i) biophysical health risk factors, (e.g. noise, dust, chemicals, construction material, solid waste, waste water, vector transmitted diseases etc), (ii) risk factors resulting from human behavior (e.g. STD, HIV etc) and (iii) road accidents from construction traffic.	The Contractor shall • Implement suitable safety standards for all workers and site visitors which shall not be less than those laid down on the international standards (e.g. International Labor Office guideline on 'Safety and Health in Construction; World Bank Group's 'Environmental Health and Safety Guidelines') and contractor's own national standards or statutory regulations, in addition to complying with the national standards of the Government of Bangladesh (e.g. `The Bangladesh Labor Code, 2006') • Provide the workers with a safe and healthy work environment, taking into account inherent risks in its particular construction activity and specific classes of hazards in the work areas, • Provide personal protection equipment (PPE) for workers, such as safety boots, helmets, masks, gloves, protective clothing, goggles, full-face eye shields, and ear protection. Maintain the PPE properly by cleaning dirty ones and replacing them with the damaged ones. • Safety procedures include provision of information, training and protective clothing to workers involved in hazardous operations and proper performance of their job • Appoint an environment, health and safety manager to look after the health and safety of the workers • Inform the local authorities responsible for health, religious and security duly informed before commencement of civil works and establishment of construction camps so as to maintain effective surveillance over public health, social and security

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		matters • To ensure the works contract incorporate minimum health and safety provisions and is being monitor by BLPA with the support from CSC during construction. •
	Child and pregnant labor	The Contractor shall • not hire children of less than 14 years of age and pregnant women or women who delivered a child within 8 preceding weeks, in accordance with the Bangladesh Labor Code, 2006
Accidents	Lack of first aid facilities and health care facilities in the immediate vicinity will aggravate the health conditions of the victims	• Provide health care facilities and first aid facilities are readily available. Appropriately equipped first-aid stations shall be easily accessible throughout the place of work • Document and report occupational accidents, diseases, and incidents. • Prevent accidents, injury, and disease arising from, associated with, or occurring in the course of work by minimizing, so far as reasonably practicable, the causes of hazards. In a manner consistent with good international industry practice. • Identify potential hazards to workers, particularly those that may be life-threatening and provide necessary preventive and protective measures. • Provide awareness to the construction drivers to strictly follow the driving rules Provide adequate lighting in the construction area and along the roads
Construction Camps	Lack of proper infrastructure facilities, such as housing, water supply and sanitation facilities will increase pressure on the local services and generate substandard living standards and health hazards.	The Contractor shall provide the following facilities in the campsites to improve health and hygienic conditions as mentioned in ECoP 17 Construction Camp Management • Adequate ventilation facilities • Safe and reliable water supply. Water supply from deep tube wells that meets the national standards • Hygienic sanitary facilities and sewerage system. The toilets and domestic waste water will be collected through a common sewerage. • Treatment facilities for sewerage of toilet and domestic wastes • Storm water drainage facilities. • Recreational and social facilities • Safe storage facilities for petroleum and other chemicals in accordance with ECoP 2 • Solid waste collection and disposal system in accordance with ECP1. • Arrangement for trainings • Paved internal roads. • Security fence at least 2 m height. • Sick bay and first aid facilities
Water and sanitation facilities at the construction sites	Lack of Water sanitation facilities at construction sites cause inconvenience to the construction workers affect their	The contractor shall provide portable toilets at the construction sites, if about 25 people are working the whole day for a month. Location of portable facilities shall be at least 6 m away from storm drain system and surface waters. These portable toilets shall be cleaned once a day and all the sewerage shall be pumped from

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
	personal hygiene.	the collection tank once a day and shall be brought to the common septic tank for further treatment. Contractor shall provide bottled drinking water facilities to the construction workers at all the construction sites.
Other ECPs	Potential risks on health and hygiene of construction workers and general public	The Contractor shall follow the following ECPs to reduce health risks to the construction workers and nearby community ECoP 2: Fuels and Hazardous Goods Management ECoP 4: Drainage Management ECoP 10: Air Quality Management ECoP 11: Noise and Vibration Management ECoP15: Road Transport and Road Traffic Management ECoP 16: River Transport management
Trainings	Lack of awareness and basic knowledge in health care among the construction workforce, make them susceptible to potential diseases.	The Contractor shall • Train all construction workers in basic sanitation and health care issues (e.g., how to avoid malaria and transmission of sexually transmitted infections (STI) HIV/AIDS. • Train all construction workers in general health and safety matters, and on the specific hazards of their work Training shall consist of basic hazard awareness, site specific hazards, safe work practices, and emergency procedures for fire, evacuation, and natural disaster, as appropriate. • Commence the malaria, HIV/AIDS and STI education campaign before the start of the construction phase and complement it with a strong condom marketing, increased access to condoms in the area as well as to voluntary counseling and testing. • Implement malaria, HIV/AIDS and STI education campaign targeting all workers hired, international and national, female and male, skilled, semi- and unskilled occupations, at the time of recruitment and thereafter pursued throughout the construction phase on ongoing and regular basis. This shall be complemented by easy access to condoms at the workplace as well as to voluntary counseling and testing.

ANNEX4: Chance Find Procedures

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

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

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

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

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

(a) Stop the construction activities in the area of the chance find;

(b) Delineate the discovered site or area;

(c) Secure the site to prevent any damage or loss of removable objects.

(d) Notify the supervisory Engineer who in turn will notify the responsible local authorities;

(e) Responsible local authorities and the relevant Ministry would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures.

(f) Decisions on how to handle the finding shall be taken by the responsible authorities and the relevant Ministry. This could include changes in the layout (such as when finding an irremovable remain of cultural or archeological importance), conservation, restoration and salvage.

(g) Implementation of the authority decision concerning the management of the finding shall be communicated in writing by the relevant Ministry.

(h) Construction work could resume only after permission is given from the responsible local authorities and the relevant Ministry concerning safeguard of the heritage.

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

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

Annex 5 DoE Standard

Schedule - 2

Air Quality Standards

[vide Clause 12]

Density in micrograms per m^3

Sl. No.	Area	Suspended Particulate Matter (SPM)	Sulfur dioxide	Carbon monoxide	Nitrogen oxides
a)	Industrial & mixed	500	120	5000	100
b)	Commercial & mixed	400	100	5000	100
c)	Residential & Rural	200	80	2000	80
d)	Sensitive	100	30	1000	30

Note:- *1) National monuments, Health-center/Hospital, Archeological site, Educational Institute and area declared by government (if applicable) are included under Sensitive Are.*

2) Industrial units not located in designated industrial area shall not discharge or emit any pollutant which may deteriorate the air quality in the areas (c) & (d) of above Table.

3) Suspended Particulate Matter (SPM) means airborne particles of diameter of 10 microns or less.

Schedule - 3

Water Quality Standards

[vide Rule 12]

A. Inland Surface Water Quality Standard

	Best Practice based classification	**pH**	**BOD mg/l**	**Dissolved Oxygen (DO), mg/l**	**Total Coliform Bacteria quantity/ml**
(a)	Potable Water Source supply after bacterial freeing only	6.5-8.5	2 or less	6 or above	50 or less
(b)	Water used for recreation purpose	6.5-8.5	2 or less	5 or above	200 or less
(c)	Potable Water Source supply after conventional processing	6.5-8.5	2 or less	6 or above	5000 or less
(d)	Water used for pisciculture	6.5-8.5	2 or less	5 or above	5000 or less
(e)	Industrial use water including chilling & other processes	6.5-8.5	2 or less	5 or above	
(f)	Water used for irrigation	6.5-8.5	2 or less	5 or above	1000 or less

Note:- *1) Maximum amount of ammonia presence in water are 1.2 mg/l (as nitrogen molecule) which is used for pisciculture.*

2) For water used in irrigation Electrical Conductivity-2250 microh mho/cm (at 25℃).

*Sodium less than 26 mg/l**

*Boron less than 2 mg/l**

B. Potable Water Quality Standard

Sl. No.	Parameter	Unit	Standard limit
1.	Aluminium	mg/l	0.2
2.	Ammonia (NH_3)	"	0.5
3.	Arsenic	"	0.05
4.	Barium	"	0.01
5.	Benzene	"	0.01
6.	BOD_5 20°C	"	0.2
7.	Boron	"	1.0
8.	Cadmium	"	0.005
9.	Calcium	"	75
10.	Chloride	"	150-600**
11.	Chlorinated alkanes	"	
	Carbon tetrachloride	"	0.01
	1,1 Dichloroethylene	"	0.001
	1,2 "	"	0.03
	Tetrachloroethylene	"	0.03
	Trichloroethylene	"	0.09
12.	Chlorinated phenols	"	
	Pentachlorophenol	"	0.03
	2,4,6 Trichlorophenol	"	0.03
13.	Chlorine (residual)	"	0.2
14.	Chloroform	"	0.09
15.	Chromium (hexavalent)	"	0.05
16.	Chromium (total)	"	0.05
17.	COD	"	4
18.	Coliform (fecal)	n/100 ml	0
19.	Coliform (total)	"	0
20.	Color	Huyghens unit	15
21.	Copper	mg/l	1
22.	Cyanide	"	0.1
23.	Detergents	mg/l	0.2
24.	DO	"	6

**** In coastal area - 1000**

B. Potable Water Quality Standard (continued)

Sl. No.	Parameter	Unit	Standard limit
25.	Fluoride	"	1
26.	Alkalinity (as $CaCo_3$)	"	200-500
27.	Iron	"	0.3
28.	Nitrogen (total)	"	1
29.	Lead	"	0.05
30.	Magnesium	"	30-35
31.	Manganese	"	0.1
32.	Mercury	"	0.001
33.	Nickel	"	0.1
34.	Nitrate	"	10
35.	Nitrite	"	Less than 1
36.	Odor	"	Odorless
37.	Oil & Grease	mg/l	0.01
38.	pH	"	6.5-8.5
39.	Phenolic compounds	"	0.002
40.	Phosphate	"	6
41.	Phosphorus	"	0
42.	Potassium	"	12
43.	Radioactive Materials total alpha radiation	Bq/l	0.01
44.	Radioactive Materials total beta radiation	"	0.1
45.	Selenium	mg/l	0.01
46.	Silver	"	0.02
47.	Sodium	mg/l	200
48.	Suspended solid particles	"	10
49.	Sulfide	"	0
50.	Sulfate	"	400
51.	Total soluble matter	"	1000
52.	Temperature	C	20-30
53.	Tin	mg/l	2
54.	Turbidity	J.T.U	10
55.	Zinc	mg/l	5

Schedule - 4

Noise Quality Standards

[vide Rule 12]

Sl. No.	Zone Class	Limits in dB_a	
		Day	Night
a)	Silent Zone	45	35
b)	Residential Zone	50	40
c)	Mixed Zone (this area is used combinedly as residential, commercial and industrial purposes)	60	50
d)	Commercial Zone	70	60
e)	Industrial Zone	75	70

Note:- *1) The day time is considered from 6 an to 9 pm. The night time is considered from 9 pm to 6 am.*

2) From 9 at night to 6 in morning is considered night time.

3) Area within 100 meters of hospital or education institution or educational institution or government designated/to be designated/specific institution/establishment are considered Silent Zones. Use of motor vehicle horn or other signals and loudspeaker are forbidden in Silent Zone.

Schedule - 5

Noise Quality Standard for Motor Vehicle or Mechanised Vessel

[vide Rule 12]

Unit in dB_a

Vehicle Type	Standard Limit	Remark
Motor Vehicle		
(all types)*	85	Measured at 7.5m from exhaust pipe.
	100	Measured at 0.5m from exhaust pipe.
Mechanised Vessel	85	Measured at rest and empty at 2.3 of maximum rotation speed at 7.5m from vessel
	100	Measured in same position at 0.5 from vessel

* *During measurement, the motor vehicle should be at rest and the condition of engine as follows:*

a) Diesel Engine at maximum rotation speed.

b) Gasoline Engine at 2/3 o maximum rotation speed and weightless acceleration.

c) *Motor Cycle - 2/3 of Maximum speed for above 5000 rpm. 3/4 of Maximum speed upto 5000 rpm*.

Schedule - 6

Motor Vehicle Exhaust Quality Standards

[vide Rule 12]

Parameter	Unit	Standard Limit
Black Smoke	Hartridge Smoke Unit (HSU)	65
Carbon	grams/km	24
Monoxide	in percent volume	4
Hydrocarbon	grams/km	2
	ppm	180
Nitrogen oxides	grams/km	2
	ppm	600

Measured at 2.3 of maximum rotation speed.

Schedule - 7

Quality Standards for Mechanised Vessel Exhaust

[vide Rules 4 & 12]

Parameter	Unit	Standard Limit
Black Smoke	Hartridge Smoke Unit (HSU)	65

Measured at 2.3 of maximum speed.

Schedule - 8

Quality Standards for Odor

[vide Rule 12]

Parameter	Unit	Standard Limit
Acetaldehyde	ppm	0.5-5
Ammonia	"	1-5
Hydrazine Sulfide	"	0.02-0.2
Methyl disulfide	"	0.009-0.1
Methyl mercaptan	"	0.02-0.2
Methyl sulfide	"	0.01-0.2
Styrene	"	0.4-2.0
Tri Methyl amine	"	0.005-0.07

Note:- *1) Following measurement is generally application for discharge or exhaust pipes of over 5m height -*

$Q = 0.108 \times He^2 Cm$

Here,

Q = gas exhaust rate in Nm^3 / hour

He = height of exhaustal pipe in meter

Cm = standard limit mentioned above (ppm)

2) In cases where limits of quality standard have been specified, the lower limit for purpose of warning and the higher for legal proceedings or penal action shall be used.

Schedule - 9

Sewer Discharge Quality Standards

[vide Rule 13]

Parameter	Unit	Standard Limit
BOD	mg/l	40
Nitrate	"	250
Phosphate	"	35
Suspended Solid (SS)	"	100
Temperature	Degree Centigrade	30
Coliform	Quantity/100 ml	1000

Note:- *1) The limits are applicable for disposal into surface / inland water stream.*

2) The sewer discharge must be decontaminated with chlorine before final disposal.

Schedule - 10

Waste Discharge Quality Standards for Industrial Units and Projects

[vide Rule 13]

Quality Standard at Discharge Point

Sl. No.	Parameter	Unit	Inland Surface Water	Public Sewer at secondary treatment plant	Irrigated Land
1.	Ammoniacal Nitrogen (N molecule)	mg/l	50	75	75
2.	Ammonia (free ammonia)	"	5	5	15
3.	Arsenic (As)	"	0.2	.05	0.2
4.	BOD_5 20°C	"	50	250	100
5.	Boron	"	2	2	2
6.	Cadmium (Cd)	"	0.05	0.5	0.5
7.	Chloride	"	600	600	600
8.	Chromium (total Cr)	"	0.5	1.0	1.0
9.	COD	"	200	400	400
10.	Chromium (hexavalent Cr)	"	0.1	1.0	1.0
11.	Copper 9Cu)	"	0.5	3.0	3.0
12.	Dissolved Oxyzen (DO)	"	4.5-8	4.5-8	4.5-8
13.	Electrical Conductivity	micro mho/cm	1200	1200	1200
14.	Total Dissolved solids (TDS)	mg/l	2,100	2,100	2,100
15.	Fluoride (F)	"	7	15	10
16.	Sulfide (S)	"	1	2	2
17.	Iron (Fe)	"	2	2	2
18.	Total Kjeldahl Nitrogen (N)	"	100	100	100
19.	Lead (Pb)	"	0.1	1.0	0.1
20.	Manganese (Mn)	"	5	5	5
21.	Mercury (Hg)	"	0.01	0.01	0.01

22.	Nickel (Ni)	"	1.0	2.0	1.0
23.	Nitrate (N molecule)	"	10.0	undetermined	10.0
24.	Oil & grease	"	10	20	10
25.	Phenol compounds (C_6H_5OH)	"	1.0	5	1
26.	Dissolved Phosphorus (P)	"	8	8	10
27.	Radioactive materials:	As determined by Bangladesh Atomic Energy Commission.			

Quality Standard at Discharge Point (continued)

Sl. No.	Parameter	Unit	Inland Surface Water	Public Sewer at secondary treatment plant	Irrigated Land
28.	pH		6-9	6-9	
29.	Selenium	mg/l	0.05	0.05	0.05
30.	Zn (Zn)	"	5.0	10.0	10.0
31.	Total dissolved solid	"	2,100	2,100	2,100
32.	Temperature	Centi-grade			
	Summer		40	40	40
	Winter		45	45	45
33.	Total Suspended Solid (TSS)	mg/l	150	500	200
34.	Cyanide (CN)	”	0.1	2.0	0.2

Note:- *1) These standards shall be applicable to industrial units or projects other than those given under Quality Standards for Classified Industries (Schedule 12).*

2) These quality standards must be ensured at the moment of going into trial production for industrial units and at the moment of going into operation for other projects.

3) The value must not exceed the quality standard during spot check at any time; if required, the quality standards may be more strict to meet the environment terms in certain areas.

4) Inland Surface Water shall mean drain, pond, tank, water body or water hole, canal, river, spring and estuary.

5) Public sewer shall mean sewer connected with fully combined processing plant including primary and secondary treatment.

6) Irrigated land shall mean appropriately irrigated plantation area of specified crops based on quantity and quality of waste water.

7) Inland Surface Quality Standards (Schedule 13) shall be applicable for any discharge

Schedule - 11

Gaseous Discharge Quality Standards for Industrial Units or Project

[vide Rule 13]

Sl. No.	Parameter	
1.	a) Electric Power Station of 200 Megawatts & above	150 mg/Nm^3
	b) Electric Power Station less than 200 megawatts	350 "
2.	Chlorin	150 "
3.	Hydrochloric Acid gas & mist	350 "
4.	Total Fluoride (F)	25 "
5.	Sulfuric Acid mist	50 "
6.	Lead particle	10 "
7.	Mercury particle	0.2 "
8.	Sulfur Dioxide	
	a) Sulfuric Acid manufacture (DCDA process)	4 kg/ton
	b) Sulfuric Acid manufacture (SCSA process)	10 "
	Minimum Stack height for Sulfuric Acid emission	
	a) Coal Fired Electric Power Station	
	i) 500 Megawatts & above	275 "
	ii) 200-500 Megawatts	220 "
	iii) Below 200 Megawatts	14$(Q)^{03}$ *
	b) Boiler	
	i) For steam @ 15 tons/hour	11 kg/ton
	ii) For steam above 15 tons/hour	14$(Q)^{03}$ *
9.	Nitrogen Oxides	
	a) Nitric Acid manufacture	3 kg/ton
	b) Gas Fired Electric Power Station **	
	i) 500 Megawatts & above	50 ppm
	ii) 200-500 Megawatts	40 "
	iii) Less than 200 Megawatts	30 "
	c) Metal Treatment Furnace	200 "
10.	Soot & Dust Particles	
	a) Air Ventilated Furnace	500 gm/Nm^3
	b) Brick-field	1000 "
	c) Cooking Furnace	
	d) Limestone Furnace	

500 "

250 "

* Q = Sulfur Dioxide emission (kg/hour)

Schedule 2

Air Quality standard

National Ambient Air Quality Standards

Published in the Bangladesh Gazette (19 July 2005)

Pollutant	Objective	Averaging Time
$PM_{2.5}$	15 µg /m3	Annual (f)
	65 µg /m3	24-hour (h)
PM_{10}	50 µg /m3	Annual (b)
	150 µg /m3	24-hours(g)
SPM	200 µg /m3	8-hours
SO_2	80 µg /m3; (0.03 ppm)	Annual
	365 µg / m3; (0.14 ppm)	24-hour (a)
NO_x	100 µg /m3; (0.053 ppm)	Annual
CO	10mg/m3; (9 ppm) (a)	8-hours (a)
	40mg/m3; (35 ppm) (a)	1-hour (a)
Lead	0.5 µg/m3	Annual (i)
Ozone	157 µg /m3; (0.08 ppm)	8-hour (e)
	235 µg /m3; (0.12 ppm)	1-hour(d)

a) Not to be exceeded more than once per year

b) The objective is attained when the annul arithmetic mean is less then or equal to 50µg/m3.

c) The objective is attained when the expected number of days per calendar year with a 24-hour average of 150µg/m3 is equal to or than 1.

d) The objective is attained when the expected number of days per calendar year with the maximum hourly average of 0.12 ppm is equal to or less then 1.

e) 3-year average of annual 4^{th} highest concentration

f) Spatially averaged over designated monitors

g) The from the 99^{th} percentile.

h) The from is the 98^{th} percentile

i) Annual arithmetic average based on lead analysis of TSP samples operated on an every 6^{th} day schedule.

ANNEX 6:Details of Public Consultations

Participants at Public Consultations at Sheola

Place: 3 No Dubagh Union Parishad
Date: 7th May, 2016 Saturday
Time: 3:30 PM

Sl No.	Name	Address
1	Ataur Rahman Khan	Upazila Chairman
2	Md. Abdus Salam	Dubagh UP Chairman
3	Jakaria Chowdhury	Borogram, Sutarkandi
4	Nazrul Islam	GaraDubagh
5	Md. Jamal Uddin	
6	Md. Jewel Ahmed (Bilash)	Dubagh Uttar
7	Bimol Das	NoyaDubagh
8	SabulAhmmed	NoyaDubagh
9	KamilAhmmed	Goynapur
10	Akter Ahmed Chowdhury	Borogram,Present- Beside of Land port
11	Md. Bibnor Ahmed	Dubagh
12	Md. Tattafaq Mahmud	Dubagh Uttar
13	Harunur Rashid	
14	Babul Hossain, Ashim Enterprise	
15	Md. MatasimAhmmed	
16	Moyna Mia	NoyaDubagh
17	Binit Chanda	DakkhinDubagh
18	Abul Kalam	Uttar Dubagh
19	Jamil Hossain	
20	Naman Ali	
21	Mst. Dilara Begum	
22	Jyotsna Begum	
23	Sultana Begum	
24	Parul Begum	Women Member
25	Md. Abul Kashem	3 No. Dubagh U.P
26	ParvezAhmmed Chowdhury	Boro Gram
27	Shams Ahmed	Uttar Dubagh
28	Kamal Ahmmed	Bangal Huda
29	Abdul Jalil	Uttar Dubagh
30	Liakat Choudhury	Boro Gram
31	Md. Misbahuddin Choudhury	Boro Gram
32	Tajel Ahmed	
33	Ruhel Ahmed	Uttar Dubagh
34	Foyez ahmed	Ratna Huda
35	Rushan Ahmed	Uttar Dubagh
36	Zamil	Uttar Dubagh
37	SolimuddinParvez	Uttar Dubagh
38	Kamal Ahmmed	Boro Gram Sadimapur
39	Nazmul Islam	Dubagh/Dubaghbazar
40	Md. Kamrul Islam	Sadimapur, Sylhetipara
41	Md. Nizam Uddin	Konagram, Satarkandi
42	Md. Abdul Quiyum	Konagram, Satarkandi
43	Rakib Chowdhury Rizlu	
44	Md. Mafizuddin Chowdhury	
45	Ruhel Ahmed Chowdhury	
46	Md. Monir Hossain	Sylheti Para
47	Md. Jakaria	
48	Sree Gonesh Chandra	Borogram
49	Sang Sattar	Maoya

Sl No.	Name	Address
50	Md. Abdullah	NoyaDubagh
51	Md. Alamgir	Uttar Dubagh
52	Md. Ihassain	Uttar Dubagh
53	Md. Abdul Mannan	Uttar Dubagh
54	Md. Sidul Islam	NoyaDubagh, DubaghbazarBeanibazar
55	Md. Aman Uddin	NoyaDubagh, DubaghbazarBeanibazar
56	Pinku Chanda	Dubagh
57	M. A Hasem	Sylheti Para
58	SelimAhmmed	Sutar Kandi
59	Md. Amir Ali	Sutar Kandi
60	Abdul Razzak	Sutar Kandi
61	MasukAhmmed	Sutar Kandi
62	Abdul Hannan Member	
63	Lee Seung Woo	
64	You SeungYeng	Architect
65	Major Said Hossain Taposh (Retd.)	Border Specialist
66	Ishtiaq Zahir	Deputy Team Leader
67	SeongYil Bae	Team Leader
68	Dhirendro Nath Sarkar	BLPA
69	Md. Shahjahan Khandker	Social Consultant
70	Dr. Jagadish Chandra Saha	Environmental Specialist

List of Participants at National Public Consultations at Dhaka

Place: TCB Auditorium

Date: 10th August 2016

Time: 9.15 am

Sl. No	Name & Designation	Name of Organization
1	Shakila Sultana Polly Assistant Director	BLPA
2	MosammatFaizunnahar Assistant Director	BLPA
3	Bashir Ahmed	ASL
4	Kamal Chandra Shil	BLPA
5	AbulKalam Azad	Yoosin-Vitti - JV
6	Md. Jamal Uddin Jibon	BLPA
7	Dr. J.C. Saha	Yoosin-Vitti - JV
8	Md. Shahadat Hossain	
9	Maj. Said Hasan Tapash	Yoosin-Vitti - JV
10	Mohammed Mohsin	Yoosin-Vitti - JV
11	Md. Monir Hossain	BLPA
12	Md. Mahbubur Rahman	BLPA
13	Benjamin p.	Retired M/O
14	Dr. Probhat Sh.	SarSystra, India
15	Md. Shahdatullah	BLPA
16	Rokanuddin	BLPA
17	AshikulAlam	RTV
18	Meher Moni	Boishakhi TV
19	Faridur Reza	Boishakhi TV
20	RanjitBabu	M/O Shipping
21	Jahangir Alam	M/O Shipping
22	Emdad	M/O Shipping
23	Jasim	M/O Shipping
24	RuhulAlam	MOS
25	Qazi Md. Ali Akbar	BLPA

Sl. No	Name & Designation	Name of Organization
26	Md. Ismail	
27	AbulKalam Azad	BLPA
28	Masum Amen	
29	Ataur Rahman Khan	Chairman Upazila, ParisadBeanibazar
30	Amir Ali	PAP, Sutarkandi
31	KirtiNishan Chakma	World Bank
32	Md. Shofiqul Islam	Office, Branch
33	Ajoy Kumar Sarkar	P O
34	Kabir Khan	PS
35	Abdul Mayen	EPOS
36	Mamun Ahmed	
37	Asaduzzaman	BN
38	Anwar	
39	Partho Gosh	Bhomra Land Port Bangladesh Land Port Authority
40	Nazrul Islam	Bhomra Land Port Bangladesh Land Port Authority
41	Md. Isom Hosen	General Secretary Reg no. 1149
42	Md. Rezaul Islam	President Reg no. 1155
43	Md. Nazrul Islam	P.O to Minister
44	Akash Kumar	
45	Md. Mazharul Islam	Protocall ministry
46	Md. Masud Rana	
47	Md. Shoel Rana	
48	Md. Mirazul Islam	SI SB Dhaka
49	Md. Rajjak	
50	Md. Nasim	Bhomra C/F Agent Association General, Secretary
51	Binu	BTV
52	Md. Shafiqul Islam	Senior Staff Reporter 24.com
53	Shohelmamun	Dhaka Tribune
54	SiyamSarker	BLPA
55	Shorif	BLPA
56	Ratan Roy	BLPA
57	Md. Selim	Vitti, S.B
58	Md. SarwarHosaain	BLPA
59	ADV. Durjoy Das	MOS
60	Md. Sohel	
61	ZisahWalid	Enviro Consultant
62	M.F Reza Sumon	Bangladesh Institute of Planning (BIP)
63	Shamim Ahmed	Tejgaon PS
64	Kazy Abdul Kalam	Tejgaon PS
65	Habibur	Tejgaon PS
67	KaziRubel	P.O to MOS, Ministry of Shipping
68	Aftab Uddin	BLPA
69	Engr. Md. RabiulAlam	JGT DSL
70	M.A Hossain	BLPA
71	Md. Shah Alam	TCB
72	Ruhul Amin	BLPA
73	Anwar Hossain	TCB
74	Zoaherlal	TCB
75	Akhta Zaman	World Bank
76	Md. Monir Hossain	T.I
77	Jahangir Alam	
78	Dr. B.K.D. Raja	International social consultant Ministry of shipping - Bangladesh
79	VenkataNukclar	Environment Consultant,Ministry of shipping -

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		Bangladesh
80	Anis Ahmad	Director (Traffic), BLPA
81	Ar. IshtiaqueZahir	Deputy team leader.Yooshin -Vitti
82	Iqbal Hossin	Project Engineer, Yooshin -Vitti
83	Abu Salek	Public Relation Officer, BLPA
84	RashadulShajib	BSBK
85	Md. Sikuzzaman	BSBK
86	Shahana Akhtar	BAPL
87	Md. Aslam Kazi	BLPA
88	Mb. A L Mamun	BLPA
89	Md.Rafiqul Islam	BLPA
90	Md. Iqbal Kabir	BSBK
91	S.M Mehedi Hasan	BSBK
92	Masuda Akter	BSBK
93	Md.Magedur Rahman	BSBK
94	Ripan Chandra Som	Accountant, BSBK
95	Sonia Kamal Emmy	Yooshin -Vitti
96	Md.Suhel Rana	Bets Consulting
97	Lee Senng Woo	Yooshin -Vitti
98	Md. Kabir Hossain	BLPA
99	Md. Zahidul Islam	BLPA
100	Md. Jasim Uddin	BLPA
101	AbulHasnat Mahmud	BLPA
102	Salah Uddin, Accountant	BLPA
103	Suman Datta	BLPA
104	Mohammad Ibrahim	BLPA
105	Mohammad Ali	BLPA
106	SeongYil Bae	Yooshin -Vitti
107	ZahirulDowlah	SAI
108	Morshed Hossain	Channel 24
109	Naser Baba	
110	FatemaAkter	BLPA
111	Monira Begum	W.S, BLPA
112	ShamimShohana	Deputy Director (Traffic), BLPA
113	Farjana	BLPA
114	Ma. Imran Hassain	Cashier BLPA
115	Md. Abul Hossain	BLPA
116	Ma. Aminul Islam	BLPA
117	Md. Jasimuuddin	BLPA
118	MdShopan	SOMOY TV
119	Md. Abdul Hannan	Po
120	MdJamanHossian	BLPA
121	Md. Alamin	
122	A.Z.M Sakhawat Hossain	Managing Director.SDF
123	Iqbal Khair	Reproter,Bctar
124	Runa Akter	BLPA
125	Md. Kalm Miah	BLPA
126	Md. Shafiqul	Tcr
127	Md. Mahfuzul Islam	BLPA
128	Md. Abdus Salam	Chairman Doubag
129	Ruhal Ahmed Chowdury	Sefl
130	Md. Jasimuddin	Ministry of shipping
131	Kamrul Hasan Jr Engineer CHT Connectivity Project	SAI and BETS ConsultingServkc Ltd.
132	Kamrul Islam	O A, Land Port

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133	Ronjit Das	BLPA
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135	GoziSarowar	Press Information Dept
136	Md. Mazharul Islam Talukder	LGED
137	Ahmede Ali	World Bank
138	Aminul IslamAsst. Engineer	BLPA
139	KaziNawshedDilwar	Bhomra President of C&F, Agent Association
140	S.A. Motin	Visitor
141	Md. AbidHossian	General Secretary Bhomra Handling labour Union, Reg - 1722
142	Md. Shajahan Ali	Office Assistant
143	Md. KibriaJolil	Visitor of traffic, President – Director
144	Md. Ali	Secretary
145	Md. Shohel	Police
146	Md. Mosiul Islam	Police
147	Md. RaselMhamud	Police
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149	Kh. Shajahan	
150	Topan Dev Nath	BLPA
151	Md. Jhangir	BIWTA
152	C H Ali	
153	Mafaz	TCB
154	Younus	MOS
155	KaziMahfuzur Rahman	TCB
156	Md. Nur Hossain	TCD
157	SumonaParvin	BRAC
158	Saif Reza	
159	Jhangir	BANK
160	Nur Hossain	BANK
161	BijonDus	My TV
162	Sqbliz	My TV
163	Md. Shohel Rana	
164	Md. Musta Uddin	Custom
165	MominMojibul 226	LGED
166	Josim Uddin	
167	Rohman	
168	Billal Hossain	
169	Habib Rohman	71 TV
170	Pias	71 TV
171	Josim	71 TV
172	Md. Shoyb Hossain	Bangladesh Media Institute&Somotol
173	Q Shahin	DBC News