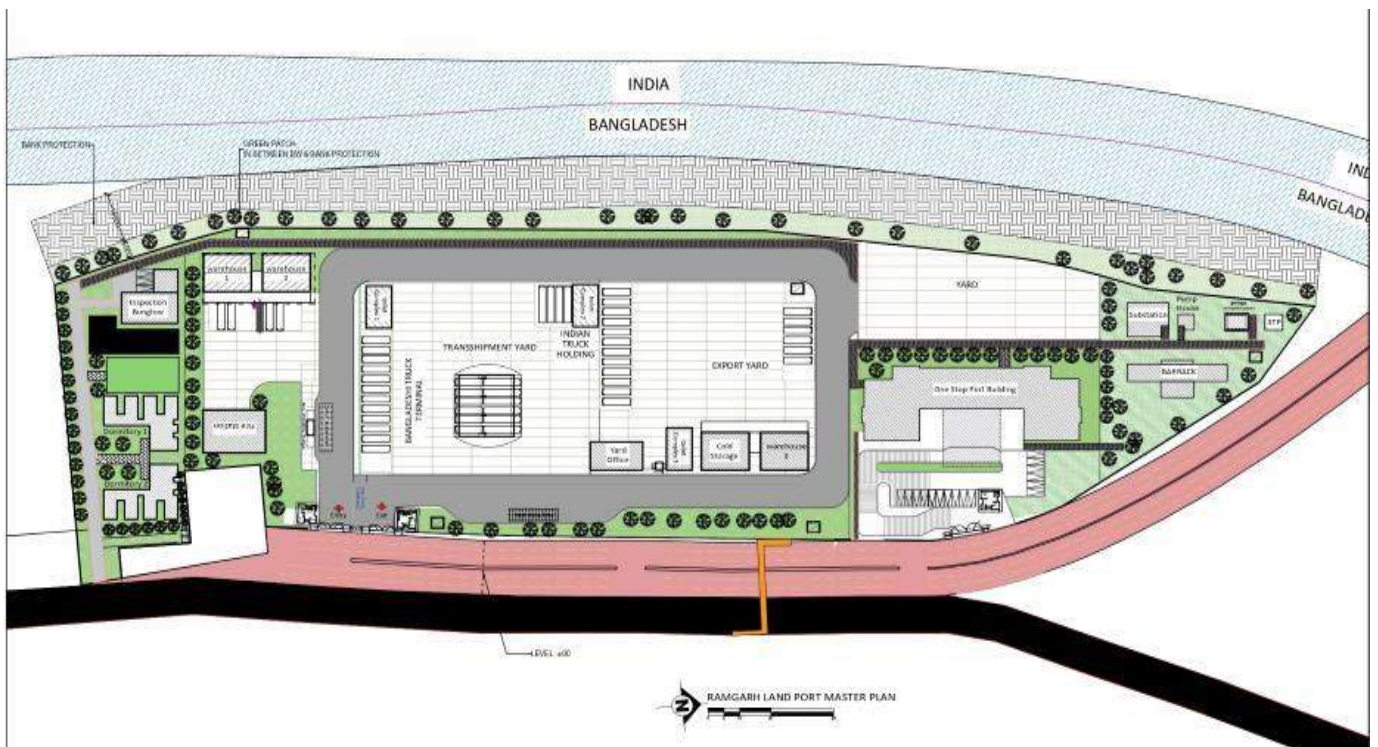




BANGLADESH LAND PORT AUTHORITY

Consultancy Services for Performing Feasibility Study of Ramgarh and Detail Design of Bhomra and Ramgarh Land Ports



Environmental Impact Assessment (EIA) Ramgarh Land Port

FINAL REPORT

September, 2020

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Prepared by:



Infrastructure Investment Facilitation Company



BETS Consulting Services Ltd



Shahidul Consultant

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Acronyms

BGB	: Border Guard Bangladesh
BLPA	: Bangladesh Land Port Authority
BOP	: Border Out Posts
BP	: Bank Procedure
BPDB	: Bangladesh Power Development Board
CSC	: Construction Supervision Consultant
DoE	: Department of Environment
E&S	: Environmental and Social
EA	: Environmental Assessment
ECA	: Environmental Conservation Act; Ecologically Critical Areas
ECR	: Environment Conservation Rules
EHS	: Environmental Health and Safety
EIA	: Environmental Impact Assessment
EMP	: Environmental Management Plan
ESMP	: Environmental & Social Management Plan
GoB	: Government of Bangladesh
GRC	: Grievances Redress Committee
GRM	: Grievances Redress Mechanism
IEE	: Initial Environmental Examination
IUCN	: International Union for Conservation of Nature
LC	: Land Customs
lpcd	: Liter per capita per day
OHS	: Occupational Health and safety
OP	: Operational Policy
PIU	: Project Implementation Unit
PM	: Particulate Matter
RAP	: Resettlement Action Plan
RLP	: Ramgarh Land Port
SIA	: Social Impact Assessment
WB	: World Bank
Pourashava	: A Municipality or a town other than the City Corporations.

Executive Summary

- E.1 Introduction:** The Government of Bangladesh has started a project named “Bangladesh Regional Connectivity Project 1(BRCP-1)”. Under this project a new feasibility as well as detailed design will be prepared for Ramgarh. As a part of this feasibility study this Environmental Impact Assessment (EIA) is carryout to identify environmental impacts due to project activities.
- Proposed area for this project is 10 acres. Land acquisition process is ongoing and there are some indigenous people so, Social safeguards policies i.e. OP/BP 4.10 & Indigenous Peoples and. OP/BP 4.12 Involuntary Resettlement as well as OP/BP 4.01 Environmental Assessment will be triggered for this project. As per Department of Environment (DoE) Schedule of Category It is a project of Orange B category. Hence a full scale EIA is not required.
- E.2 Policies and Legislation:** The importance of environmental consideration related to industry, construction as well as rehabilitation projects has been recognized in a number of national documents that set the legal and regulatory framework for management of the environment of various sector projects. The Environmental and Social (E&S) Regulatory Framework is characterized by policy, legal and regulatory mechanisms promulgated in the country. Legislative references for Environmental Assessment (EA) in Bangladesh are the Environmental Policy 1992, Environmental Conservation Act 1995 (ECA-95) and the Environmental Conservation Rules 1997 (ECR-97, amended 2017). Department of Environment (DoE), under the Ministry of Environment (MoE), is the regulatory body responsible for enforcing the ECA-95 and ECR-97.
- The World Bank has ten environmental, social, and legal safeguard policies which are- Environmental Assessment (OP/BP 4.01), Natural Habitats (OP/BP 4.04), Pest Management (OP/BP 4.09), Physical Cultural Resources (OP/BP 4.11), Forests (OP/BP 4.36), Safety of Dams (OP/BP 4.37), Indigenous Peoples (OP/BP 4.10), Involuntary Resettlement (OP/BP 4.12), International Waterways (OP/BP 7.50) and Disputed Areas (OP/BP 7.60).
- Operational Policies (OP) are the statement of policy objectives and operational principles including the roles and obligations of the Borrower and the Bank, whereas Bank Procedures (BP) is the mandatory procedures to be followed by the Borrower and the Bank. Apart from these, the International Finance Corporation (IFC) guidelines for Environmental Health and safety have been adopted by the World Bank Group which is also relevant for environmental protection and monitoring. In addition to that the Policy on Access to Information of World Bank also relates to environmental safeguard.
- E.3 Project Description:** Ramgarh Land Port is located at the southeast border of Bangladesh in Ramgarh Upazila of Khagrachari Hill District. The closest Indian border area is Sabroom of South Tripura district of Tripura Province. The Project site is adjacent to the River Feni and the natural borderline between Bangladesh and India. The Government of India is already started the construction of the bridge. There is decent road connectivity with Ramgarh from Khagrachari Hill District, Sadar, and junction point of Dhaka-Chattogram highway to Chattogram Port, Dhaka and other parts of the country. The Upazila complex of Ramgarh Sadar and Pourashava are approx. 1.5 km away from the proposed land port area and also in the Pourashava boundary. Electricity is available at Upazila Sadar, which the land port can connect to for smooth operation. There is mobile network coverage in the area. There are currently no Customs and Immigration facilities in this area although a border outposts (BOP) of Border Guards Bangladesh (BGB) is located at Mahamuni Para very close to the proposed

land port area. Other Upazila level government offices are located nearby. Villages with residence and greenery appearance are also located near the area.

7. Ramgarh is about 49.7 km from Khagrachari Hill District and about 65.3km away from Feni Sadar. The Upazila has a number of tribal community inhabitants, some of them within the project area and the radius of 2/3 kilometres of the proposed site of the land port. BLPA is going to acquire 10 acre of land for development of this project.
8. The development is proposed in three phases for ease of implementation and employing resources at the pace of need of growth and expansion. In total an area of 21 acres is planned for overall development of the Ramgarh Land Port for catering need of up to 2050. The land as earmarked and currently under process of acquisition takes an almost linear shape on one side of Ramgarh-Bariarhar Highway. In the first phase (during 2022-23), 10-acre land is planned to be developed. In Phase 2, 3.30 acres is considered to be taken and developed during 2025-2026. In Phase 3 (during 2032-2034), 7.46 acre is recommended to be developed. Present environmental study is carried out for Phase-1. Consultancy services, land acquisition, construction and development of different facilities, social impacts mitigation, resettlement and relocation, environmental impact mitigation are activities under phase 1. Proposed Land Port Facilities will be constructed under this phase-1 are given in Section 3.3.
9. **E.4 Environmental and Social Baseline:** The project area is characterized by high land which is mainly above normal inundation level. Elevation of the area is around 19.5 m from MSL. Feni River is adjacent to the project area. According to Bangladesh National Building Code, 2015 (BNBC), project site lies in the seismic zone-III which is also called severe intensity seismic zone with basic seismic coefficient of 0.28 g.
10. The soil of the area belongs to Northern and Eastern Hills Region of Bangladesh Physiography. In this region, hills have been dissected to different degrees over different rocks. In general, slopes are very steep and few low hills have flat summits. The major hill soils are yellow-brown to strong brown permeable friable loamy, very strongly acidic and low in moisture holding capacity. However, soil patterns generally are complex due to local differences in sand, silt and clay contents of the underlying sedimentary rocks and in the amount of erosion that has occurred. Brown Hill soils are the predominant general soil type of the area. Organic matter content and general fertility level is low.
11. Habitat types in the project and surrounding area are cultivated land, grassland, and water body. There will have no impact on downstream of Feni River, as a riverbank protection embankment at the project site will be constructed and no waste will be discharged into the river. Project will not fragment the natural forest as there is no forest within an area of 1.00 km. Available species (fauna) and variety (flora) in the project influence area are least concern according to International Union for Conservation of Nature (IUCN) list for Bangladesh. Also, project activities will not affect the biodiversity of that area because proper mitigation measures will be taken. It is also suggested that if any species with concern is found during construction or operation phase then action will be taken to conserve that species. Different types of flora and fauna available around the project location have been discussed in section 4.11.2.
12. From Bangladesh Bureau of Statistics (BBS) District Statistics 2011, it was found that population density of Ramgarh Upazila during 2011 was 249 per sq. km. Population density of Ramgarh Upazila and of Khagrachari Hill District was 249 and 223 respectively and household size for the Upazila, district varied from 4.80 to 4.59. Sex Ratio of male/female was very close to 1.05 in both Ramgarh Upazila and Khagrachari Hill District. Noted religious institutions in

Ramgarh upazila are Ramgarh Central Jami Mosque, Mahamuni Buddhist Monastery, Ramgarh Dakshineswari Kalibari.

13. The SIA data comprised census of Project Affected Persons and an inventory of losses of land, structure, crops and trees etc. It also comprised a baseline survey of 190 sample households in Ramgarh and Matiranga Upazila of Khagrachari Hill District.
14. In the project area men and women of Bangalee and Ethnic community are living cordially and in a conservative society. About 27.56% of Bangalee Respondents of SIA have household chores as main occupation which is 17.24% for Ethnic Community respondents. While 51.72% of the Ethnic community respondents are day labourer this is 22.83% for the Bangalee respondents. About 22% of Bangalee but 7% of ethnic community respondents have business as main occupation but about 11% of Bangalee and 7% of ethnic people have agriculture as main occupation.
15. The literacy rate of ethnic people is 71% which is 80% of Bangalee respondents as per SIA but 86% of ethnic people and 68% of Bangalee are literate as per Resettlement Action Plan (RAP). This means that the Project Affected Persons (PAP) respondents of ethnic community are generally better educated than the SIA respondents.
16. The project will support removal of gender inequality in employment, improving participation in project activities, increasing awareness, will address violence against women and girls during implementation, gender sensitization particularly of the decision makers, and gender focus in project support.
17. **E.5 Public Consultation and Disclosure:** Public discussion meeting was held on 27th February, 2020 at 11.30 am in the conference room, Upazila parishad, Ramgarh Upazila, Khagrachari. The meeting was attended by more than 60 people, which represent the affected persons, local community and relevant stakeholders including both Govt. and private sector representatives. Meetings were also held with the local govt. officials and their valuable opinions were recorded.
18. **E.6 Identification of Potential Impact:** Construction phase activities would have major impacts on land use, air quality, demography socioeconomics and noise quality. It could also develop minor impacts on water use, water quality and ecology. During construction phase, the major activities to be considered important for identification of impacts are-site preparation: excavation and backfilling; hauling of earth materials and wastes; pilling, cutting and drilling; mixing of concrete and mortar; concrete construction; erection of steel structures; internal and access road construction; painting and finishing; clean-up operations; construction of infrastructural facilities; landscaping and afforestation.
19. The environmental aspects and impact of The Ramgarh Land Port related to operational activities and services are identified. To the identification and assessment of the environmental aspects; the Ramgarh Land Port has been divided into a number of functions which are-electricity generation, vehicle movement, office activities; godown and transports. Operational phase activities may have impacts of minor or major, positive or negative, on all the environmental disciplines as soils, surface and groundwater, hydrology, micrometeorology, land use, water use, water and air quality, terrestrial and aquatic ecology, socioeconomics and noise. After analysis potential adverse impacts for land port are- Air Pollution, Noise Pollution, Solid waste disposal, Accident & Human health, Water Pollution, Labour Influx, Heat and Beneficial Impact Are-Employment opportunity, Socio-economic condition, New trade/ business, Family finance, Social Amenities & Infrastructural Facilities.

Impact and mitigation measures for detailed existing structures, vegetation and funeral place are described in Resettlement Action Plan (RAP) Ramgarh land port.

20. **E.7 Environmental Management Plan and Monitoring Plan (ESMP):** The ESMP for Ramgarh Land Port Authority has been prepared based upon optimum and reasonable costs that are needed for mitigation measures on a “least-cost” basis. Activities that needs to be carried out for the environmental management and monitoring of the proposed plan is divided into three phases: during pre-construction, construction and operation phases.
21. Environmental and Social Management Plans provide recommendations for environmental and social management measures based on the available information at this stage of the project. The port authority will formulate the environment management cell with vision to operate the ESMP requirements as suggested in the chapter 7.
22. **E.8 Capacity Building:** Capacity building for effective implementation of the environmental and social safeguard requirements is a key element of the Environmental Management Plan (EMP). Capacity building for environmental and social safeguard management will need to be carried out at all tiers of the project, including Bangladesh Land Port Authority (BLPA), Environmental and Social (E&S) Cell, Construction Supervision Consultant (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, Occupational Health and Safety (OHS) aspects and waste disposal. Section 6.7 is also suggested various environmental and social trainings to be conducted at the construction site.
23. **E.9 Documentation and Reporting:** Project Construction Management and Supervision Consultants will collect all data and information related to the implementation of ESMP on behalf of Project Implementation Unit (PIU) and submits monthly, half yearly and yearly reports to the Project Director during construction. During operational phase, the BLPA will give additional responsibility to one of the officer from Ramgarh Land Port, who will collect related data and information regularly and prepare reports as desired by project management.
24. **E.10 Cost Estimation for Environmental Mitigation Measures and Monitoring:** Detailed cost estimates for environmental mitigation is given in Chapter 8 and Annex-16. Total ESMP implementation cost for 2nd and 3rd phase for Ramgarh Land Port will be BDT 12,270,000.00. Total ESMP cost for all three phases will be BDT 24,310,000.00. Only for 1st Phase total cost for environmental management and monitoring will be BDT 12,040,000.00. This cost will not include in the cost of feasibility study but will be mention during bid document preparation.
25. **E.11 Disaster Management Plan:** Disaster of Land Port consists of two principal hazards. This is because of employ, many different processes involving a wide range of different imported and exported materials. The common hazards are fire, explosion, toxic release and environmental damage.
26. For this project, emergency response systems should be in place to deal with dangerous goods uncontrolled releases of dust and gaseous emission, natural calamities fire burns and injuries. There are to be trained emergency response teams, specific contingency plans and

incidence specific equipment packages in place to cope with these types emergency. In case of an emergency incident occur, immediate action must be taken to mitigate the impacts.

27. **E.12 Grievance Redress Mechanism (GRM):** The Land Port authority will have a GRM Management policy & a two tier Grievance Redress Committee. One at community level and the other at headquarter level. The community level committee is to be formed with seven members headed by one officer of the port. There will be 3 staff/workers & 3 community representatives including one tribal people in the committee. The complainer can inform his/her problem both verbally and in writing. For verbal complain, the cell number of concern officer may be used. Written complaints may be sent through post office/Courier services or in person or dropping in the grievance box. Details of Grievance Redress Mechanism (GRM) procedure is given in Section 9.7.
28. **E.13 Conclusion and Recommendation:** The report has been prepared complying the regulations of DoE and World Bank. Identified area which have E & S risk for this project are air pollution, noise pollution, solid waste disposal, accident & human health. Fire hazards, health and safety issues considering present COVID-19 pandemic and impacts due to air and noise pollution are major impacts associated during construction and operation phase of the port. A well trained firefighting unit and environmental experts are to be kept standby for any incident/accident.
29. However, no development can be expected without any adverse impacts on environment. The beneficial effect of the development project on the nation as well as on human beings would only be meaningful and sustainable, if the adverse impacts are minimized through strict maintenance and control measures as advised in the report. No hill cutting and filling of any water body will be required for development of this land port.
30. Several environmental and social considerations need to be comprehensively addressed to improve the sustainability of the project. Some of these improvement proposals are summarized as follows:
 - All types of support from different government and autonomous body like World Bank, Local Government, Department of Environment and others should be provided to the port authority;
 - The ESMP should be implemented timely and properly by concerned authority;
 - Air quality and noise level in the port area should always remain below the acceptable standard set by DoE;
 - Monitoring of quality of surrounding air and soils, and drinking water and water of the nearby rivers should be conducted periodically and mitigation should be done accordingly; and
 - Local people may be given priority during recruitment.

1 Introduction

1.1 Introduction

31. The Government of Bangladesh has started a project named “Bangladesh Regional Connectivity Project 1(BRCP-1)” which is jointly implemented by the Bangladesh Land Port Authority (BLPA), National Board of Revenue (NBR) and Ministry of Commerce (MoC). This project is carryout with a loan of USD 150 million from the World Bank with GoB funding of USD 20.42.
32. This Project consists of three major components of which Component-1 include Invest in infrastructure, systems and procedures to modernize key selected land ports essential for trade with India, Bhutan and Nepal. Under this component, work will start for four land port where Ramgarh Land Port is one of them. Ramgarh is located on the border with Tripura state, Northeast India, where potentially a co-location modern border management concept could be piloted. Under this project a new feasibility as well as detailed design will be prepared for Ramgarh. As a part of this feasibility study Environmental Impact Assessment (EIA) is carryout to identify environmental impacts due to project activities.
33. Proposed area for this project is 10 acres. Land acquisition process is ongoing and there are some indigenous people so, Social safeguards policies i.e. OP/BP 4.10 & Indigenous Peoples and. OP/BP 4.12 Involuntary Resettlement as well as OP/BP 4.01 Environmental Assessment will be triggered for this project. As per DoE Schedule of Category it is a project of Orange B category. Hence a full scale EIA is not required.

1.2 Importance of the Project

34. Bangladesh Land Port Authority (BLPA) came into being under Bangladesh Land Port Authority Act, 2001 (Act 20 of 2001) as statutory body in order to facilitate and improve the export-import activities with the neighbouring countries through the land routes. Since inception, Bangladesh Land Port Authority has been functioning under the Ministry of Shipping. So far 24 Land Customs Stations have been declared as Land Ports. Out of them 12 land ports are wholly in operation. At present BLPA is working as a development partner of the government through providing service-oriented port management, earning government revenue and creating employment opportunity. As a result, the working scope of this body is exponentially increased day by day on multi-dimensional basis.
35. Ramgarh land port will increase trade with India's Tripura state. If Bangladesh and India succeed in implementing a co-location border post management model, this would be a ground-breaking step forward for regional collaboration efforts and would be the first of its kind in the South Asia Region. If not doable, then a traditional border post and management design can still be pursued to develop a new land port at this strategic location along the Southwest-Northeast Corridor.
36. The Ramgarh Land Port under consideration by GoB as a pilot for a co-located shared facility with Government of India is located at Ramgarh in Chattogram Hill Tracts (CHT) opposite the town of Sabroom, Tripura State, India. Correspondingly, the Government of India has also designated this border crossing as a strategic priority and has committed to build an Integrated Check Post (ICP) at this location. Tripura is a landlocked state of

Northeast India. Currently, trade between Tripura and mainland India must pass through a long hilly and unsafe route through the Meghalaya, Assam and West Bengal provinces (aka the Chicken's Neck or Siliguri Corridor) which adds another one thousand kilometres to the journey each way. Allowing trade at Ramgarh will shorten the trip significantly, reduce transport cost and is expected to facilitate increased trade. Bangladesh can expect to import timber, minerals and agricultural products while exporting RMG, industrial products and constructional materials. The benefits of this project are following:

- There will be opportunities for infrastructure development in the hill areas
- It will help to achieve the SDG's goals
- Trade with India will be expanded;
- Regional connectivity will be improved;
- Coordination of trade sectors, economic empowerment and trade opportunities for women will be increased
- Implementation of tariff modernization plan will be easy.

1.3 Objectives

1.3.1 Objectives of the Project

37. The objective of the Bangladesh Regional Connectivity Project-1 (BRCP-1) is to improve conditions for trade through improving connectivity, reducing logistics bottlenecks and supporting the adoption of modern approaches to border management and trade facilitation, essential for trade with India, Bhutan and Nepal. This Project Component, Development of Ramgarh land port is to invest in infrastructures, system and procedures to modernize key selected land port essential for trade with India, Bhutan and Nepal and it is being implemented by Bangladesh land Port Authority BLPA. The following key results are expected from the project:

- To develop physical infrastructures for imported and exportable goods and vehicles at Ramgarh;
- Enhance the connectivity between Bangladesh and India;
- Increase cross border trade facilities through land routes with India;
- Modern border management concept will be piloted with Tripura State, Northern India;
- Better monitoring, improved governance and management of trade activity.

1.3.2 Objectives of EIA

38. The principal objective of the study is to provide an examination and assessment of the environmental impacts of due to the construction of the said land port and its mitigation process through documenting the present environmental base line study, preparing environmental management and mitigation plan. The specific objectives of the study are:

- Present a brief discussion on the IEE/EIA process and its role in the planning and implementation of the project;
- Present a general description of the project and the process;
- Present a description of the pre-project environment;
- Delineate the significant environmental issues found and believed to be involved;

- Identify the environmental impacts of the project and quantify them to the possible extent; and
- Suggest the plan for management of the environment both during the construction and operation of the project.

1.4 Scope

39. The scope of work for the EIA study involves identifies initial environmental impacts of development of Ramgarh Land Port. The study will present the current environmental condition of the project area and helps to identify anticipated impacts to make an Environmental and Social Monitoring Plan (ESMP) with details Environmental Impact Assessment (EIA).
40. The EIA study provides information on the baseline environmental condition (physical, biological, social and environment) of the study area. Suggestion and recommendation are to be made for abatement/mitigation/management measures to ensure environmental, biological, health and social compatibility and also to comply with the national and international environmental legal requirements and environmental quality standards.
41. In order to conduct the EIA study, the team carried out field survey/study to collect primary data/information both for environment and social condition. At the same time face-to-face interview were held during field study and survey from 16 to 17 February 2020. Beside this, secondary data and information were collected from different govt. offices, govt. reports, publications, etc.

1.5 Challenges

42. Major Challenges identified for this project are:
- Land acquisition without any conflict with local people;
 - Present the importance of the project to the tribal community by following their law and without disturbing their custom;
 - Transportation of construction materials in the project site;
 - Control any illegal issues arise due to port activities;
 - Control any impact on surrounding environment and ecosystem;
 - Complete the project within project schedule.

1.6 Consistency with DoE Guidelines

43. Environmental Conservation Act (ECA 95) is the main legislative document relating to environmental protection in Bangladesh. No development project shall be established or adopted without obtaining environmental clearance, in the manner prescribed by the rules (ECR 97, amended 2017), from the Director General, Department of Environment.
44. The rules (ECR 97) mainly consist of:
- Categorization of the projects (Green, Orange A, Orange B and Red)
 - Application format to obtain environmental clearance
 - Ambient standards in relation to air pollution, water pollution, noise pollution as well as permitted discharge/ emission levels of pollutions due to development activities or industry.
45. The rules incorporate inclusion lists of projects requiring varying degrees of

environmental investigation e.g. all the new projects under Orange-B and Red category generally will require two steps assessment procedure, firstly an initial environmental examination (IEE) for site clearance and secondly, if required, a full Environmental Impact Assessment (EIA) for technical clearance. The Ramgarh Land Port Project falls under Orange B category and requires IEE report. This present EIA study will fulfil the requirement of both DOE and World Bank.

1.7 Consistency with World Bank Safeguard Policy/ Guidelines

46. The objective of these policies is to prevent and mitigate undue harm to people and their environment due to development process. Safeguard policies provide a platform for the participation of stakeholders in project design, and act as an important instrument for building ownership among local populations. The effectiveness and sustainability of development projects and programs supported by the Bank has substantially increased as a result of attention to these policies.

1.8 Methodology

47. The report is based on the primary data generated during field study and survey works. Field visits were conducted in project area located at Ramgarh upazila of Khagrachhari Hill District and its adjoining areas with a view to reconnaissance and detail physical survey of the surrounding locations. Discussions with different types of stakeholders were conducted to know the apprehended problems and their probable solutions. Secondary data were collected from various sources like government offices, different publications, journals, etc. These were followed by evaluation of the information to delineate the major environmental and social issues relating to the Project. During the process the following steps were followed:

- Collect information from project areas related to study;
- Detail understanding of scope of assignment, activities involved and the intervention areas and its surrounding environment;
- Engage resource persons'/field staff for the assignment;
- Collection of all possible data on the environmental, social and natural resource components and parameters;
- Collection and review of pertinent report and other references which particularly are included in environmental policies, ECA 95, ECR 97 and also World bank safeguard policies;
- Meet concerned agencies and gather information from various government and other agencies, local govt. bodies, etc.;
- Undertake field visit and field survey which are representative of geographical, geological and also potential environmental and social problem areas;
- Conduct representative survey of a wide section of people of proposed project areas to acquire field level data on existing environment, biodiversity, health and socio-economic and apprehended impacts of projects;
- Identification of possible environmental impacts and evaluation of their significance and consequences;
- Development of Environmental and Social Management Plan (ESMP), for possible mitigation of negative impacts and enhancing measures for beneficial impacts and prepare an Environmental Monitoring Plan
- Suggestion of mitigation measures for residual impacts (if any); and

- Finally prepare the EIA report.

1.9 EIA Team

48. A multidisciplinary team of professionals having experience of conducting Environment & Social Impact Assessment studies for Industrial parks, Industrial cluster, Special Economic Zones, DTA, Economic Zones, Area development, Industrial Corridors etc. were involved in carrying out EIA study for this project. Details of the professionals are given in the Table below:

Table 1: EIA team

SN	Name of the Professionals	Position Assigned
1.	Dr. Engr. Md. Eftekharul Alam	Team Leader
2.	Kbd. Md. Nurul Houqe	Environmental and Social Survey Expert
3.	Engr. Amal Chandra Paul	Baseline survey and quality testing Expert
4.	Sadia Afrin Nitol	Associate Environmental Consultant

2 Policies and Legislation

2.1 Background

49. The importance of environmental consideration related to industry, construction as well as rehabilitation projects has been recognized in a number of national documents that set the legal and regulatory framework for management of the environment of various sector projects. The Environmental and Social (E&S) Regulatory Framework is characterized by policy, legal and regulatory mechanisms promulgated in the country. Legislative references for Environmental Assessment (EA) in Bangladesh are the Environmental Policy 1992, Environmental Conservation Act 1995 (ECA-95) and the Environmental Conservation Rules 1997 (ECR-97, amended 2017). Department of Environment (DoE), under the Ministry of Environment (MoE), is the regulatory body responsible for enforcing the ECA-95 and ECR-97.

2.2 National Environmental Acts, Rules, Polices and Strategies

2.2.1 National Environmental Policy, 1992

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

2.2.2 Bangladesh Environmental Conservation Act (ECA) 1995

51. This umbrella Act (amended in 2020) includes laws for conservation of the environment, improvement of environmental standards, and control and mitigation of environmental pollution. It is currently the main legislative framework document relating to environmental protection in Bangladesh, which repealed the earlier Environment Pollution Control ordinance of 1977. The main provisions of the Act can be summarized as:

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

2.2.3 Environment Conservation Rules (ECR) 1997 (Amended in 2017)

52. These are the first set of rules, promulgated under the Environment Conservation Act 1995. Among other things, these rules set (i) the National Environmental Quality Standards for ambient air, various types of water, industrial effluent, emission, noise, vehicular exhaust etc., (ii) requirement for and procedures to obtain Environmental Clearance, and (iii) requirements for IEE/EIA according to categories of industrial and other development interventions.
53. However, the rules provide the Director General a discretionary authority to grant 'Environmental Clearance' to an applicant, exempting the requirement of site/location clearance, provided the DG considers it to be appropriate.
54. Environment Conservation Rules (ECR) has classified the projects into following four categories based on their site conditions and the impacts on the environment; (a) Green, (b) Orange A, (c) Orange B and (d) Red. Various industries and projects falling under each category have been listed in schedule 1 of ECR 1997. According to the Rules, location clearance certificate is required for category Orange A, B and Red projects and followed by issuing of Environmental Clearance upon the Land Port submission of the required documents. Green listed industries are considered relatively pollution-free, and therefore do not require site clearance from the DoE. On the other hand, Red listed industries are those that can cause 'significant adverse' environmental impacts and are, therefore, required to submit an EIA report. These industrial projects may obtain an initial Site Clearance on the basis of an IEE based on the DoE's prescribed format, and subsequently submit an EIA report for obtaining Environmental Clearance.

2.2.4 National Conservation Strategy, 1992

55. The National Conservation Strategy, 1992 provides recommendations for sustainable development of the industrial sector. The key aspects of the strategy are as follows:
- All industries shall be subject to an EIA and the adoption of pollution prevention/control technologies shall be enforced;
 - Hazardous or toxic materials / wastes shall not be imported as raw materials for industry;
 - Import of appropriate and environmentally-sound technology shall be ensured; and
 - Dependence on imported technology and machinery should gradually be reduced in favor of sustainable local skills and resources.

2.2.5 National Environmental Management Action Plan (NEMAP)

56. This is a wide-ranging and multi-faceted plan, which builds on and extends the statements, set out in the National Environmental Policy. NEMAP was developed to address issues and management requirements related to the environment during the period 1995 to 2005; it also sets out the framework within which the recommendations of the National Conservation Strategy are to be implemented. NEMAP was developed to achieve the following broad objectives: i) Identification of key environmental issues affecting Bangladesh; ii) Identification of actions necessary to halt or reduce the rate of environmental degradation; iii) Improvement of the

natural environment; iv) Conservation of habitats and bio-diversity; v) Promotion of sustainable development; and vi) Improvement of the quality of life of the people. To attain the above mentioned objectives, the plan groups all the relevant necessary actions under four headings, namely: institutional, sectorial, location- specific and long-term issues.

2.2.6 Environment Court Act, 2000

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

2.2.7 Noise Pollution (Control) Rules, 2006

58. Noise Pollution (Control) Rules have been established in order to manage noise generating activities which have the potential to impact the health and wellbeing of workers and the surrounding communities. Under this legislation, control zones are listed as- silent area, residential area, mixed area, commercial area and industrial area.

2.2.8 The Forest Act, 1927 and the Forest (Amendment) Act, 2000

59. The Forest Act, 1927 is the first and omnibus law of the land for forestry. It provides for reserving forests over which the Government has an acquired property right. According to the Act the Government (Forest Department) can prohibit certain activities in the declared Reserved Forest area such as any intervention kindles, keeps or carries any fire; trespasses or pastures cattle, or permits cattle to trespass; causes any damage by negligence in felling any tree or cutting or dragging any timber etc.

2.2.9 Private Forests Ordinance Act, 1959

60. An Ordinance to provide for the conservation of private forests and for the afforestation in certain cases of waste lands in Bangladesh. Whereas, it is expedient to provide for conservation of forests and for the afforestation of waste lands in Bangladesh where such forests or lands are not the property of the Government or where the Government have no proprietary right over such forests or lands.

2.2.10 National Forest Policy, 1994

61. The National Forest Policy of 1994 is the amended and revised version of the National Forest Policy of 1977 in the light of the National Forestry Master Plan. The major goals of the policy are to conserve the existing forest areas, bring about 20 per cent of the country's land area under the Forestation Program and increase reserve forests by 10 per cent per year to 2015 through coordinated efforts of GoB-NGOs and through active participation of the people.

62. Amendments of the existing laws (acts, rules and regulations) relating to the forestry sector and creation of new laws for sectorial activities have been recognized as important conditions for achieving the policy goals and objectives. The Forestry

Policy also recognizes the importance of fulfilling the responsibilities and commitments under International Conventions, Treaties and Protocols (ICTPs).

2.2.11 National Biodiversity Strategy & Action Plan, 2004

63. NBSAP for Bangladesh, 2004 provides a framework for conservation, sustainable use and sharing the benefits of Biodiversity of the country. A major focus of the NBSAP, 2004 is the need for cross-sectoral linkages, reflecting the fact that in Bangladesh, biodiversity conservation is closely interwoven with social and economic development. Thus, the NBSAP also provides a framework for securing the necessary environmental conditions to reduce poverty, ensure sustainable development and respond to the implementation of elements of the country's PRSP.

2.2.12 Bangladesh Biodiversity Act, 2017

64. Bangladesh biodiversity act was created to conserve biodiversity and its components. To engage local bodies in conservations, management and documentation of bio diversity, this act provide different committee system in local government and local administrative units.

2.2.13 Wildlife Conservation (Protection and Safety) Act, 2012

65. The act has been formulated for the conservation and safety of wildlife to manage the protected areas. The act depicts 10 new types of protected areas. The bill with many other provisions proposed stern action for violation of the law. It proposed one-year imprisonment and Taka 50,000 fine for such a violation. The law also proposed at least two years and the highest seven years of imprisonment and minimum Taka one lakh and maximum Taka 10 lakh fine for killing a tiger or an elephant.

2.2.14 National Water Policy, 1999

66. The NWP promulgated in 1999 with the intension of guiding both public and private actions in the future for ensuring optimal development and management of water that benefit both individuals and the society at large. The policy aims to ensure progress towards fulfilling national goals of economic developments, poverty alleviation, food security, public health and safety, decent standard of living for the people and protection of natural environment. According to the policy, all agencies and departments entrusted with water resource management responsibilities (regulation, planning, construction, operation, and maintenance) will have to enhance environmental amenities and ensure that environmental resources are protected and restored in executing their tasks. Environmental needs and objectives will be treated equally with the resources management needs.

2.2.15 The Groundwater Management Ordinance, 1985

67. This is an ordinance to manage groundwater resources. This Act authorizes the Upazila Parishad to grant a license for installing tube wells under its jurisdiction. The Upazila Parishad may grant the license if the Parishad is satisfied that the installation of the tube well i) Will be beneficial to the areas where it is to be installed; ii) Will not have any adverse effect upon the surrounding areas iii) otherwise feasible.

2.2.16 National Water Management Plan, 2001 (approved in 2004)

68. The National Water Resources Council approved on March 31, 2004 a 25-year National Water Management Plan. The plan provides a framework within which all concerned with the development, management and use of water resources water services in Bangladesh can plan and implement their own activities in a coordinated and integrated manner. The planned activity programs have been presented in the eight sub-sect oral clusters: i) Institutional Development, ii) Enabling Environment, iii) Main River, iv) Towns and Rural Areas, v) Major Cities; vi) Disaster Management; vii) Agriculture and Water Management, and viii) Environment and Aquatic Resources. Each cluster comprises of a number of individual programs. WARPO was assigned to monitor the NWMP.

2.2.17 National Water Bodies Protection Act, 2000

69. The enforcement agency of this act is the Municipalities and the Town development authority. The characterization of water bodies as rivers, canals, tanks or flood plain identified in the master plans formulating under the laws establishing municipalities in the division and district towns shall not be changed without approval of concerned ministry.

2.2.18 National Water Act, 2013

70. The National Water Act, 2013 is based on the NWP and provides the legal framework for integrated development, management, abstraction, distribution, usage, protection and conservation of water resources in Bangladesh. The Act provides for the formation of a high-powered National Water Resources Council headed by the Prime Minister. An Executive Committee under the MoWR will implement the decisions taken by the council. As per this Act, all forms of water (e.g., surface water, groundwater, seawater, rainwater and atmospheric water) within the territory of Bangladesh belong to the government on behalf of the people. Private landowners will be able to use the surface water inside their property for all purposes in accordance with the Act. Draining of wetlands that support migratory birds has been prohibited by the Act. Consequently, without prior permission from the Executive Committee, building of any structure that can impede the natural flow of water has been prohibited. A few activities like dredging of rivers for maintaining navigability, land reclamation projects by filling wetlands, and flood control and erosion control structures will be exempted pending prior permission.

2.2.19 The Protection and Conservation of Fish Act 1950 (amended in 1982)

71. Ministry of Fisheries and Livestock is the enforcement agency of this act. Protection and Conservation of Fish in government owned water bodies is the main objective of this act.

2.2.20 National Fisheries Policy, 1999

72. The National Fisheries Policy, 1999 was formulated following review and intent of the East Bengal Protection and Conservation of Fish Act 1950, which was updated by the Protection and Conservation of Fish (Amendment) Ordinance 1982 and further

refined by the Protection and Conservation of Fish (Amendment) Act 1995. These Acts and ordinance provide provisions for the protection and conservation of fish in fresh water and brackish water bodies. The Fisheries Policy highlights the need to conserve fish breeding grounds and habitats. It intends to promote fisheries development and conservation in all water bodies. The project should consider these policies to protect the habitats, migration and connectivity of fish and fisheries resources around the project area. Measures to reduce any potential negative impacts on local fish populations will be incorporated into all stages of the Project.

2.2.21 National Land-use Policy, 2001

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

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

2.2.22 National Agriculture Policy, 2013

74. The National Agriculture Policy, 2013 approved by the Government focuses on agriculture production, alleviating poverty through generating jobs and ensuring food security. The main objective of the policy is to ensure food and nutrition security for all and improvement of rural livelihoods through increased crop production with higher productivity and creating employment opportunities through diversification of agricultural activities. The policy outlined nine specific objectives. Although the policy does not emphasize the coastal zone separately, all specific objectives are applicable to the development of coastal zone agriculture. The government will pursue a program for agro-ecologically disadvantaged regions in the hilly area, drought-prone area, Barind tract, char land, haor-baor and the coastal belt with appropriate technological support. To increase water productivity and enhance irrigation efficiency through optimal use of available water resources the government will facilitate dissemination of water management technology. Modern irrigation, drainage and water application systems will be introduced for expanding irrigation coverage including difficult or disadvantaged areas, i.e. in char, hilly, Barind tract, drought-prone and saline areas.

2.2.23 National Livestock Development Policy, 2007

75. Under this policy the Poultry Development was considered with due importance and explained. The backyard poultry units require minimum inputs and are often part of integrated crop aquaculture-livestock farming systems. There are at present no adequate guidelines for environmental protection and bio-security when establishing poultry farms. The use of antibiotics in feeds is thought to be common

and a cause of public health concern. The constraints facing the sector in general include: (i) lack of infrastructure beyond the Upazila Head Quarters for providing services to poultry farmers; (ii) shortage of skilled manpower; (iii) shortage of quality chicks and breeding materials; (iv) shortage of poultry , feed/feed ingredients and high prices; (v) poor quality of inputs; (vi) lack of quality control facilities for medicine, vaccines and biological products, feed and feed ingredients, chicks, eggs and birds; (vii) drug and vaccine residues in poultry meat; (viii) shortage of vaccines; (ix) lack of organized marketing systems; (x) poor provision of veterinary services; and (xi) insufficient credit and capital especially for the poor.

2.2.24 National Land Transport Policy, 2004

76. The government approved the NLTP in April 2004, which introduced the concept of long-term network planning and integration of transport policy, planning and appraisal across land transport modes. Each sub-sector undertakes physical and institutional improvement in line with its long-term policy provided in the NLTP with each sub-sector master plan. Major issues by subsector include (i) maintenance financing, quality, safety and overloading in major roads; (ii) better planning in rural roads; (iii) restructuring Bangladesh Railways into a commercially oriented organization in conjunction with substantial investment in infrastructure, rolling stocks and wagons, equipment and technical modernization; (iv) efficient dredging and tariff regulation in inland waterways; and (v) operation efficiency improvements in ports. As indicated in the NLTP, environmental adaptation needs to be taken into account in project assessment, which will help mitigate climate change.

2.2.25 Standing Orders on Disaster, 2010

77. In order to manage the paradigm, shift in disaster management, a disaster management regulatory framework is established under which the Bangladesh Disaster Management Framework is implemented, and in which work of Ministries, Departments, NGOs and civil society are undertaken. The regulatory framework provides the relevant legislative, policy and best practice framework under which the activity of Disaster Risk Reduction (DRR) and Emergency Response Management (ERM) in Bangladesh is managed and implemented.

2.2.26 Strategy for Waste Management

78. The GoB has taken some initiatives and accordingly in December 2010, the DoE under MOEFCC has formulated a national “3R” strategy for waste management in a draft form. It is the latest strategy which will take time to implement globally. The concept of this strategy is minimizing waste impacts in terms of quantity or ill-effects, by reducing the number of waste products with simple treatments and recycling the wastes by using it as resources to produce same or modified products. The principle of “3R” is stated as reducing waste, reusing and recycling resources and products. Reducing means choosing to use with items with care to reduce the amount of waste generated. Reusing involves the repeated use of items or parts of items which still have usable aspect. Recycling means the use of waste itself as resources.

2.2.27 The Energy Policy, 1996

79. An earlier energy planning effort led to the formulation of the first National Energy

Policy (NEP) in 1996, which brought Government attention to the urgency of ensuring proper exploration, production, distribution and rational use of energy sources to meet the growing energy demand of the country.

2.2.28 Bangladesh National Building Code (BNBC), 2015

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

81. Bangladesh National Building Code (BNBC) clearly sets out the constructional responsibilities according to which the relevant authority of a particular construction site shall adopt some precautionary measures to ensure the safety of the workmen. To prevent workers falling from heights, the Code in section 3.7.1 to 3.7.6 of chapter 3 of part 7 sets out the detailed requirements on the formation and use of scaffolding. According to section 3.9.2 of the same chapter, “every temporary floor opening shall either have railing of at least 900 mm height or shall be constantly attended. Every floor hole shall be guarded by either a railing with toe board or a hinged cover. Alternatively, the hole may be constantly attended or protected by a removable railing. Every stairway floor opening shall be guarded by railing at least 900 mm high on the exposed sides except at entrance to stairway. Every ladder way floor opening or platform shall be guarded by a guard railing with toe board except at entrance to opening. Every open sided floor or platform 1.2 meters or more above adjacent ground level shall be guarded by a railing on all open sides except where there is entrance to ramp, stairway or fixed ladder. The precautions shall also be taken near the open edges of the floors and the roofs”.

2.2.29 The Penal Code, 1860

82. The Penal Code of 1860 has some valid provisions related to pollution management, environment protection and protection of health and safety. Chapter XIV of the Penal Code provides offenses effective public health, safety, convenience, decency, and morals; Section 277: Falling Water or Public Spring or Reservoir; Section 278: Making Atmosphere Noxious to Health; Section 284: Negligent Conduct with Respect to Poisonous Substance; Section 285: Negligent Conduct with Respect to Fire or Combustible Matter; and Section 286: Negligent Conduct with Respect to Explosive Substance. According to the Section 277, whoever voluntarily corrupts or fouls the water of any public spring or reservoir, to render it less fit for the purpose for which it is ordinarily used will be punished under the law. According to the Section 278, whoever voluntarily vitiates the atmosphere in any place so as to make it noxious to the health of persons in general dwelling or carrying on business in the neighbourhood or passing along a public way will get punishment.

2.3 National Social Acts, Rules, Polices and Strategies

2.3.1 The Acquisition and Requisition of Immovable Property Act, 2017

83. The principal legal instrument governing land acquisition in Bangladesh is Acquisition

and Requisition of Immovable Property Act, 2017 (ARIPA 2017). This act is a replacement of the Acquisition/ Requisition of Immovable Property Ordinance, 1982. The ARIPA 2017 requires that compensation be paid for (i) land and assets permanently acquired (including standing crops, trees, houses); and (ii) any other damages caused by such acquisition. The Act also provides for the acquisition of properties belonging to religious organizations like mosques, temples, pagodas and graveyards if they are acquired for public interest. The ARIPA, however, excluded the acquisition of properties used by the public for the purpose of religious worship, graveyards and cremation grounds. The Act stipulates certain safeguards for the landowners and provides for payment of “fair value” for the properties acquired.

2.3.2 Constitutional (Article 23A, 28(4)) Right of the Tribal Peoples Rights

84. The Constitution of Bangladesh ensures affirmative action for indigenous peoples and prohibits discrimination inter alia on grounds of race, religion or place of birth, Article 23A of which provides, “the State shall take steps to protect and develop the unique local culture and tradition of the tribes, minor races, ethnic sects and communities”. It also spells out in Article 28 (4), “nothing in this Article shall prevent the State from making special provision in favour of women or children or for the advancement of any backward section of citizens”.

2.3.3 The CHT Regional Council Act, 1998

85. Enacted for the establishment of Chattogram Hill Tracts Regional Council. Whereas Chattogram Hill Tracts is a region inhabited by backward tribal people and it is necessary to adopt special measures for development of underdeveloped areas; and Whereas it is necessary to improve more of the political, social, cultural, educational and economic rights of all people of Chattogram Hill Tracts including the tribal people of the region, and expedite the process of socio-economic development; and Whereas Keeping in view of the above aims for the purpose of overall development of all people of Bangladesh including the above mentioned objectives under the framework of the constitution of the People’s Republic of Bangladesh the National Committee on Chattogram Hill Tracts and Chattogram Hill Tracts Jana Sanghati Samity expressing full and total allegiance to sovereignty and territorial integrity of Bangladesh, signed an agreement on December 2, 1997/18th Agrahayan, 1404; and Whereas it is expedient and necessary to provide for setting up a Regional Council for coordinating the activities of the three Hill District Councils and performing other relevant functions as part of implementation of that agreement.

2.3.4 Bangladesh Labor Act, 2006

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

2.3.5 Bangladesh Labour Rules, 2015

87. This Rules pertains to the occupational rights and safety of workers and the provision of a comfortable work environment and reasonable working conditions. In third chapter of this document, rules about appointment of adolescent workers are provided. Pregnancy welfare benefits related rules are provided within chapter four. Health protection measures are described within chapter five. In chapter VI of this document safety precaution regarding explosive or inflammable dust/gas, protection of eyes, protection against fire, works with cranes and other lifting machinery, lifting of excessive weights is described. Special Regulations regarding Health, Health Rules and Safety are provided within chapter seven. In the Chapter VIII provision safety measure like as appliances of first aid, maintenance of safety record books, rooms for children, housing facilities, medical care, group insurance etc. are illustrated. Workings hours & level are described within chapter nine. In chapter ten & eleven wage & its payment, wage board are included. Within chapter twelve Compensation for Injuries of the Workers due to Accident related rule are included.

2.4 Conventions, Treaties and Protocols

88. Environmental problems which migrate beyond the jurisdiction (Trans-boundary) require power to control such issues through international co-operation by becoming a Contracting Party (CP) i.e., ratifying treaties or as Signatory by officially signing the treaties and agreeing to carry out provisions of various treaties on environment and social safeguards. Bangladesh has been signed and ratified various Multilateral Environmental Agreements (MEAs), International Labor Organization (ILO) Conventions, and International Maritime Conventions. The relevant international conventions have been summarized in the in the Table below.

Table 2: Applicable International Conventions

Treaty or Convention & holding year	Brief Description
Convention on Protection of birds, Paris, 1950	Protection of birds in wild state
Convention on oil pollution damage (Brussels), 1969	Civil liability on oil pollution damage from ships
Ramsar Convention, 1971	Protection of wetlands
World Cultural and Natural Heritage (Paris), 1972	Protection of major cultural and natural monuments
CITES Convention (Washington), 1973	Ban and restrictions on international trade in endangered species of wild fauna and flora
Bonn Convention, 1979	Convention of migratory species of wild animal
Prevention and Control of Occupational Hazards (Geneva) 1974	Protect workers against occupational exposure to carcinogenic substances and agents
Occupational hazards due to air pollution, noise and vibration (Geneva) 1977	Protect workers against occupational hazards in the working environment
Occupational safety and health in	Prevent accidents and injury to health by

Treaty or Convention & holding year	Brief Description
working environment (Geneva) 1981	minimizing hazards in the working environment
Occupational Health Services (Geneva) 1985	To promote a safe and healthy working environment
Vienna convention, 1985	Protection of ozone layer
Civil liability on transport of dangerous goods (Geneva), 1989	Safe methods for transport of dangerous goods by road, railway and inland vessels
Convention on oil pollution (London), 1990	Legal framework and preparedness for control of oil pollution
London Protocol, 1990	Control of global emissions that deplete ozone layer
UN Framework convention on climate change (Rio de Janeiro), 1992	Regulation of greenhouse gases emissions
Convention on Biological Diversity (Rio de Janeiro), 1992	Conservation of bio-diversity, sustainable use of its components and access to genetic resources
International Convention on Climate Changes (Kyoto Protocol), 1997	International treaty on climate change and emission of greenhouse gases
Protocol on biological safety (Cartagena Protocol), 2000	Biological safety in transport and use of bio-products

2.5 World Bank Environmental and Social Safeguard Policies

89. The World Bank has ten environmental, social, and legal safeguard policies which are listed below:

90. Environmental policies:

- OP/BP 4.01 Environmental Assessment
- OP/BP 4.04 Natural Habitats
- OP/BP 4.09 Pest Management
- OP/BP 4.11 Physical Cultural Resources
- OP/BP 4.36 Forests
- OP/BP 4.37 Safety of Dams

91. Social policies

- OP/BP 4.10 Indigenous Peoples
- OP/BP 4.12 Involuntary Resettlement
- Legal Policies
- OP/BP 7.50 International Waterways
- OP/BP 7.60 Disputed Areas

92. Operational Policies (OP) are the statement of policy objectives and operational

principles including the roles and obligations of the Borrower and the Bank, whereas Bank Procedures (BP) is the mandatory procedures to be followed by the Borrower and the Bank. Apart from these, the IFC guidelines for Environmental Health and safety have been adopted by the World Bank Group which is also relevant for environmental protection and monitoring. In addition to that the Policy on Access to Information of World Bank also relates to environmental safeguard. The environmental safeguard and access to information policy as well as the IFC guidelines are discussed below:

2.5.1 Environmental Assessment (OP/BP 4.01)

93. This policy is considered to be the umbrella safeguard policy to identify, avoid, and mitigate the potential negative environmental and social impacts associated with Bank lending operations. In World Bank operations, the purpose of Environmental Assessment is to improve decision making, to ensure that project options under consideration are sound and sustainable, and that potentially affected people have been properly consulted. The borrower is responsible for carrying out the EA and the Bank advises the borrower on the Bank's EA requirements. The Bank classifies the proposed project into three major categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts:
94. Category A: The proposed project 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.
95. Category B: The proposed project's potential adverse environmental impacts on human population or environmentally important areas-including wetlands, forests, grasslands, or other natural habitats- are less adverse than those of Category A projects. These impacts are site specific; few if any of them are irreversible; and in most cases mitigation measures can be designed more readily than Category A projects.
96. Category C: The proposed project is likely to have minimal or no adverse environmental impacts.

2.5.2 Natural Habitats (OP/BP 4.04)

97. The conservation of natural habitats is essential for long-term sustainable development. The Bank therefore supports the protection, maintenance, and rehabilitation of natural habitats and their functions in its economic and sector work, project financing, and policy dialogue. The Bank supports, and expects borrowers to apply, a precautionary approach to natural resource management to ensure opportunities for environmentally sustainable development. The Bank does not support projects that involve the significant conversion or degradation of critical natural habitats.

2.5.3 Pest Management (OP/BP 4.09)

98. The aim of the pest management policy is to minimize and manage the environmental and health risks associated with pesticide use and promote and support safe, effective and environmentally sound pest management. The procurement of any pesticide in a Bank-financed project is contingent on an

assessment of the nature and degree of associated risks, taking into account the proposed use and the intended user. To manage pests that affect either agriculture or public health, the Bank supports a strategy that promotes the use of biological or environmental control methods and reduces reliance on synthetic chemical pesticides. In Bank- financed projects, the borrower addresses pest management issues in the context of the project's environmental assessment. In appraising a project that will involve pest management, the Bank assesses the capacity of the country's regulatory framework and institutions to promote and support safe, effective, and environmentally sound pest management.

2.5.4 Physical Cultural Resources (OP/BP 4.11)

99. Physical cultural resources are defined as movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Their cultural interest may be at the local, provincial or national level, or within the international community. Physical cultural resources are important as sources of valuable scientific and historical information, as assets for economic and social development, and as integral parts of a people's cultural identity and practices. The Bank assists countries to avoid or mitigate adverse impacts on physical cultural resources from development projects that it finances. The impacts on physical cultural resources resulting from project activities, including mitigating measures, may not contravene either the borrower's national legislation, or its obligations under relevant international environmental treaties and agreements. The borrower addresses impacts on physical cultural resources in projects proposed for Bank financing, as an integral part of the environmental assessment (EA) process.

2.5.5 Forests (OP/BP 4.36)

100. Forest is defined as an area of land of not less than 1.0 hectare with tree crown cover (or equivalent stocking level) of more than 10 per cent that have trees with the potential to reach a minimum height of 2 meters at maturity in situ. A forest may consist of either closed forest formations, where trees of various stories and undergrowth cover a high proportion of the ground, or open forest. The definition includes forests dedicated to forest production, protection, multiple uses, or conservation, whether formally recognized or not. The definition excludes areas where other land uses not dependent on tree cover predominate, such as agriculture, grazing or settlements. In countries with low forest cover, the definition may be expanded to include areas covered by trees that fall below the 10 per cent threshold for canopy density, but are considered forest under local conditions. The Bank's forests policy recognizes the importance of forests to reduce poverty in a sustainable manner integrates forests effectively in economic development, aims to reduce deforestation, promote afforestation and enhance the environmental contribution of forested areas. The Bank assists borrowers with the establishment and sustainable management of environmentally appropriate, socially beneficial, and economically viable forest Port area plantations to help meet growing demands for forest goods and services.

2.5.6 Safety of Dams (OP/BP 4.37)

101. When the World Bank finances new dams, the Policy Safety on Dams requires that experienced and competent professionals design and supervise construction, and that the borrower adopts and implements dam safety measures through the project cycle. The policy also applies to existing dams where they influence the performance of a project. In this case, a dam safety assessment should be carried out and necessary additional dam safety measures implemented.

2.5.7 Involuntary Resettlement (OP/BP 4.10)

102. This policy is triggered in situations involving involuntary taking of land and involuntary restrictions of access to legally designated parks and protected areas. The policy aims to avoid involuntary resettlement to the extent feasible, or to minimize and mitigate its adverse social and economic impacts. It promotes participation of displaced people in resettlement planning and implementation, and its key economic objective is to assist displaced persons in their efforts to improve or at least restore their incomes and standards of living after displacement. The policy prescribes compensation and other resettlement measures to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to Bank appraisal of proposed projects.

2.5.8 Indigenous People (OP/BP 4.12)

103. The term “Indigenous Peoples” is used in a generic sense to refer to a distinct, vulnerable, social and cultural group possessing the following characteristics in varying degrees: i) self-identification as members of a distinct indigenous cultural group and recognition of this identity by others; ii) collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories; iii) customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture; and iv) an indigenous language, often different from official language of the country/ region.
104. The Bank provides project financing only where free, prior, and informed consultation results in broad community support to the project by the affected Indigenous Peoples. Such Bank-financed projects include measures to (a) avoid potentially adverse effects on the Indigenous Peoples’ communities; or (b) when avoidance is not feasible, minimize, mitigate, or compensate for such effects. Bank-financed projects are also designed to ensure that the Indigenous Peoples receive social and economic benefits that are culturally appropriate and gender and inter-generationally inclusive.

2.5.9 International Waterways (OP /BP 7.50)

105. Projects on international waterways may affect the relations between the World Bank and its borrowers, and between riparian states. Therefore, the Bank attaches great importance to the riparian making appropriate agreements or arrangements for the entire waterway, or parts thereof, and stands ready to assist in this regard. A borrower must notify other riparian of planned projects that could affect water quality or quantity, sufficiently far in advance to allow them to review the plans and raise any concerns or objections.

2.6 Environmental, Health and Safety (EHS) Guidelines of WBG and IFC, 2008

106. The Environmental, Health and Safety (EHS) Guidelines of the World Bank Group (WBG)/International Finance Corporation (IFC), 2008 is the safeguard guidelines for environment, health and safety for the development of the industrial and other projects. They contain performance levels and measures that are considered to be achievable in new facilities at reasonable costs using existing technologies. When host country regulations differ from the levels and measures presented in the EHS Guidelines, projects are expected to achieve whichever is more stringent. If less stringent levels or measures than those provided in these EHS Guidelines are appropriate, in view of specific project circumstances, a full and detailed justification for any proposed alternatives is needed as part of the site-specific environmental assessment. This justification should demonstrate that the choice for any alternate performance levels is protective of human health and the environment.

107. The section 4 of EHS Guidelines for “Construction and Decommissioning” provides additional, specific guidance on prevention and control of community health and safety impacts that may occur during new project development, at the end of the project life-cycle, or due to expansion or modification of existing project facilities.

2.7 Applicable World Bank Policies to the Project

108. The applicable World Bank policies for the development of Ramgarh Land Port are given in Table 3.

Table 3: Triggering the World Bank Policies for Project

Directive	Policy	Applicability for the Project	Explanation
Environmental Assessment	OP/BP 4.01	Triggered.	Construction and operation of land port expected to cause impact on natural environment (air and noise quality) and health and safety of local community and workforce. This project 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.	Natural habitat is found sporadically in very small area (Less than 1/4 th hectore). There are no existing protected areas and no area is officially proposed to be protected by the government nor by the traditional local communities. Land uses in 1 km area is not dependent on predominate tree cover. Land use type within 1 km area and project site is agriculture, grazing and settlements. So, OP 4.04 (Natural habitats) will not be triggered.

Directive	Policy	Applicability for the Project	Explanation
Pest Management	OP 4.09	Not triggered.	The project will not procure any pesticides, nor will they induce an increased use of pesticides.
Physical Cultural Resources	OP 4.11	May be triggered	Though no PCRs are thought to be located in the proposed project, but there is a chance finds. If it happens then the chance find procedural guidelines must be considered in the event that previously unknown heritage resources which are exposed or found during the life of the project.
Indigenous Peoples	OP/BP 4.10	Partly triggered	There are 17 indigenous people who have been affected by the project.
Involuntary Resettlement	OP/BP 4.12	Triggered	10 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.	Natural habitat is found sporadically in very small area (Less than 1/4 th hectore). There are no existing protected areas and no area officially proposed by governments nor by traditional local communities. Land uses in 1 km area is not dependent on predominate tree cover. Land use type within 1 km area and project site is agriculture, grazing and settlements. So, OP 4.36 (Forests) will not be triggered.
Safety of Dams	OP/BP 4.37	Not triggered	N/A
Projects in International Waterways	OP/BP/GP 7.50	Not triggered	The policy is not triggered because the project is not expected to cause any adverse change in the quality or quantity of water flows to the other riparian; and will not adversely affect the other riparian's possible water use. Furthermore, the other riparian has constructed infrastructure on its side of the border to help facilitate trade with the proposed Land Port.
Projects in Disputed Areas	OP/BP 7.60	Not triggered	The project is not located in a disputed area.
Access to Information		Applicable to the project.	Executive summary of EIA will be disclosed in on BLPA website in English and Bangla (because all local people including ethnic people understand Bangla).

2.8 Gap analysis between the GoB laws/regulations and the World Bank safeguard policies

109. There is no significant gap between WB safeguard policies and GoB's National Environmental Policy 1992, Bangladesh Environmental Conservation Act (ECA), 1995 amended 2002 & Environment Conservation Rules (ECR) 1997 amended 2003. A Gap analysis is given in Table 4.

Table 4: Gap analysis between the GoB laws/regulations and the World Bank safeguard policies for Environment which are related to the project

Subject	OP/BP 4.01	GoB laws/regulations	Gap/ Project measures
Environmental Assessment	This policy is considered to be the umbrella safeguard policy to identify, avoid, and mitigate the potential negative environmental and social impacts associated with Bank lending operations. In World Bank operations, the purpose of Environmental Assessment is to improve decision making, to ensure that project options under consideration are sound and sustainable, and that potentially affected people have been properly consulted. The borrower is responsible for carrying out the EA and the Bank advises the borrower on the Bank's EA requirements. The Bank classifies the proposed project into three major categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts:	<p>National Environmental Policy 1992,</p> <p>Bangladesh Environmental Conservation Act (ECA), 1995 amended 2002</p> <p>This umbrella Act includes laws for conservation of the environment, improvement of environmental standards, and control and mitigation of environmental pollution. It is currently the main legislative framework document relating to environmental protection in Bangladesh, which repealed the earlier Environment Pollution Control ordinance of 1977.</p> <p>Environment Conservation Rules (ECR) 1997 amended 2003</p> <p>Rule 7 of Environment Conservation Rules (ECR) has classified the projects into following four categories based on their site conditions and the impacts on the environment; (a) Green, (b) Orange A, (c) Orange B and</p>	There are no significant gap between WB safeguard policies and GoB's National Environmental Policy 1992 Bangladesh Environmental Conservation Act (ECA), 1995 amended 2002 & Environment Conservation Rules (ECR) 1997 amended 2003

	<p>Category A: The proposed project 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.</p> <p>Category B: The proposed project's potential adverse environmental impacts on human population or environmentally important areas-including wetlands, forests, grasslands, or other natural habitats- are less adverse than those of Category A projects. These impacts are site specific; few if any of them are irreversible; and in most cases mitigation measures can be designed more readily than Category A projects.</p> <p>Category C: The proposed project is likely to have minimal or no adverse environmental impacts.</p>	<p>(d) Red. Various industries and projects falling under each category have been listed in schedule 1 of ECR 1997. According to the Rules, Environmental Clearance Certificate is issued to all existing and proposed industrial units and projects, falling in the Green Category without undergoing EIA. However, for category Orange A and B and for Red projects, require location clearance certificate and followed by issuing of Environmental Clearance upon the satisfactory submission of the required documents. Green listed industries are considered relatively pollution-free, and therefore do not require site clearance from the DoE. On the other hand, Red listed industries are those that can cause 'significant adverse' environmental impacts and are, therefore, required to submit an EIA report. These industrial projects may obtain an initial Site Clearance on the basis of an IEE based on the DoE's prescribed format, and subsequently submit an EIA report for obtaining Environmental Clearance.</p>	
Involuntary Resettlement	OP/BP 4.12	GoB laws/regulations	Gap/ Project measures
	This policy is triggered in situations involving	Compensation Principles & Standards 20. The following	There are no significant gap

	<p>involuntary taking of land and involuntary restrictions of access to legally designated parks and protected areas. The policy aims to avoid involuntary resettlement to the extent feasible, or to minimize and mitigate its adverse social and economic impacts. It promotes participation of displaced people in resettlement planning and implementation, and its key economic objective is to assist displaced persons in their efforts to improve or at least restore their incomes and standards of living after displacement. The policy prescribes compensation and other resettlement measures to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to Bank appraisal of proposed projects.</p>	<p>principles and standards will be used to determine compensation and assistance for persons / households in the different impact categories: Acquired Lands and Other Assets Replacement costs for an equal amount of land of same use and quality, including the registration costs and stamp duties. Replacement costs of houses / structures and other immovable built items (e.g. water supply, sanitation, drainage, etc.) at current market prices of the same building materials, plus the current costs of labor to build them. Current market prices of trees and other assets which are irreplaceable. Current market prices of crops in the field or on trees, if the lands are used before harvest. If the acquired land is agricultural and amounts to 20% or more of the total productive lands owned by the affected household, a transition allowance at three times the value of the crops produced in a year in the acquired portion.</p>	<p>between WB safeguard policies and GoB's rules and regulation.</p>
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3 THE PROJECT

3.1 Project Overview

110. Ramgarh is a now non-existent border crossing between Bangladesh and India, although it is occupying a key strategic location between Northeast India and Chattogram Port. It is on the road to Chattogram from the southern border of Tripura, and the closest point in Northeast India to Chattogram Port. The opening of new trade routes between Bangladesh and the north-eastern states of India through Ramgarh-Sabroom border point is considered as a high potential commercial route in the near future, should a formal border station be erected. Chattogram Port can serve as the main port of Northeast India, and bilateral trade is expected to increase significantly. Ramgarh could also serve as a transit point between West Bengal, Tripura, and the rest of Northeast India.

3.2 Location of Ramgarh Land Port

111. Ramgarh Land Port is located at the southeast border of Bangladesh in Ramgarh Upazila of Khagrachari Hill District. The closest Indian border area is Sabroom of South Tripura district of Tripura Province. The Project site is adjacent to the River Feni and the natural borderline between Bangladesh and India. The Government of India is already started the construction of the bridge. There is decent road connectivity with Ramgarh from Khagrachari Hill District, Sadar, and junction point of Dhaka-Chattogram highway to Chattogram Port, Dhaka and other parts of the country. The Upazila Sadar Complex of Ramgarh and Ramgarh Pourashava are approx. 1.5 km away from the proposed land port area and also in the Pourashava boundary. Electricity is available at Upazila Sadar, which the land port can connect to for smooth operation of land port activities. There is mobile network coverage in the area. There are currently no Customs and Immigration facilities in this area although a BOP of BGB is located at Mahamuni Para very close to the proposed land port area. Other Upazila level government offices are located nearby. Villages with residence with greenery appearance are also located near the area.

112. Ramgarh is about 49.7 km from Khagrachari Hill District town and about 65.3km away from Feni Sadar. The Upazila has a number of tribal community inhabitants, some of them within the project area and the radius of 2/3 kilometres of the proposed site of the land port. BLPA will acquire 10 acre of land for this project.

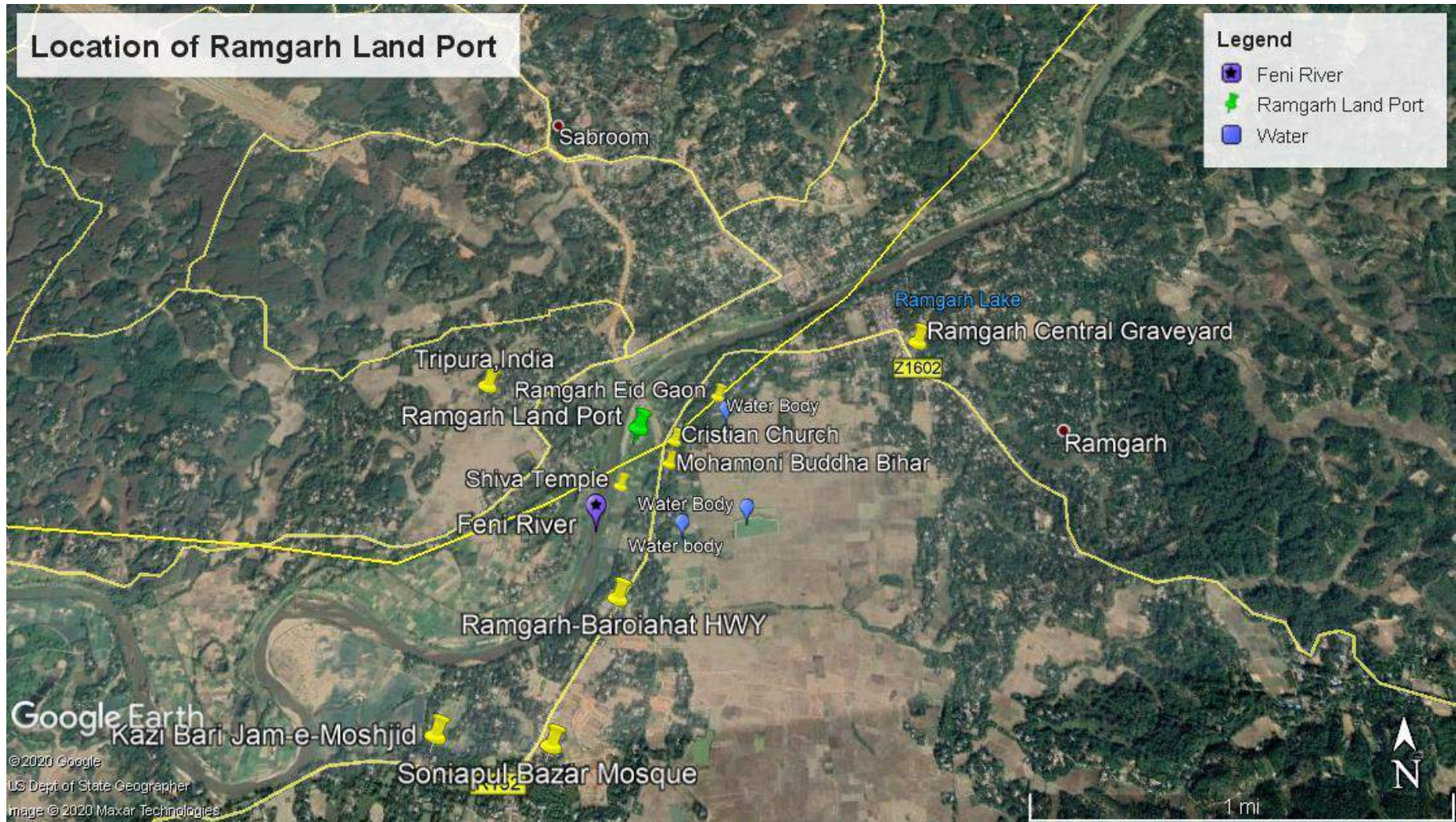


Figure 1: Location map of the Project

3.3 Project Activities

113. The development may be made in phases, as the demand will take time to speed up and early development without demand will keep the assets idle for an indefinite time. The Phase 1 development is recommended to be done to address the pent-up demand which could not be fulfilled through land border at Belonia. As Ramgarh is currently a green field site, and the fore, no statistics of past traffic is available, Belonia Land Port has been taken as a proxy for understanding likely traffic situation at Ramgarh.
114. The development is proposed in three phases for ease of implementation and employing resources at the pace of need of growth and expansion. If all the structures are constructed before the target requirement, then land port is likely to have resources remaining idle. Also, there are complexities with land acquisition which involves a lengthy process. Therefore, it is recommended for three phases for catering the needs during the periods 2020 -2025, 2025-2032 and 2032-2050.
115. An area of 21 acres is required for overall development of the Ramgarh Land Port for catering need of up to 2050. The land as earmarked and currently under process of acquisition takes an almost linear shape on one side of Ramgarh-Bariarhar Highway. In the first phase (during 2022-23), 10-acre land is planned to be developed. In Phase 2, 3.30 acres is considered to be taken and developed during 2025-2026. In Phase 3 (during 2032-2034), 7.46 acre is recommended to be developed.
116. Present environmental study is carried out for Phase-1. During Phase-1 following activities will be carried out and facilities will be developed –

Table 5: Proposed activities and facilities of RLP for Phase-1

Activities	Proposed facilities for Ramgarh Land Port	
<ul style="list-style-type: none"> • Consultancy Services • Land acquisition • Contraction and development of different facilities • Social Impacts Mitigation • Resettlement and relocation • Environmental Impact Mitigation 	<ul style="list-style-type: none"> • Pavement • Permanent Boundary Wall • Internal Road Network • Garbage Bins • Landscaping • Passenger’s Over-Pass • One stop Port Building • Ware house • Cold storage • Parking Area • Transshipment Yard Shed • Bangladesh Truck Terminal 	<ul style="list-style-type: none"> • Check post for Border • Car Wash and Service Area • Open Stack Yard • Area internal Lighting, road, etc. • Substation Building • Watch Tower • Toilet Complex • Septic tank, soak well • Water Pipe network • Area Drainage • Substation Equipment • Pump House • Weighing Bridge

Activities	Proposed facilities for Ramgarh Land Port	
	<ul style="list-style-type: none"> India Truck Terminal Customs Inspection Building Barrack Facilities for Drivers and Labors 	<ul style="list-style-type: none"> IT Solution system, Networking, etc. Security system, CCTV, alarm etc. Fire detection, Fire protection system

3.4 Expected People, Waste Generation and Utility Requirement

- Expected people at the port facility**

117. From the feasibility report of Ramgarh Land port, it is found that during the operation phase 145 numbers of persons will work as permanent staff in the land port. Beside this, passenger traffic in Ramgarh is expected to be around 500 per day during operation phase of the port.

118. During overall construction period approx. 600 nos. of labour is expected whereas 20% of them will be non-local. During operation 145 number of persons will work as permanent staff and 33% of them will be non-local.

- Waste generation**

119. Initially at the land port, BLPA will collect all the waste materials and will separate and store in two different bins (one for organic matter and another for inorganic matter) and then deliver to the local waste handlers licensed by municipality.

120. It is the responsibility of municipality (Pourashava) to issue license for waste management within this area. Municipality issues license(renewable) to the waste handlers for one year following their own rules/regulation/ criteria.

121. Following table shows the expected amount of waste which will be generated from the activities of Ramgarh Land port during operation phase:

Table 6: Waste generation during operation

Units/ Offices	No. of Port users	SW generation rate		Total Solid Wastes/day	
		kg/c/d	l /c/d	Kg	L
Custom passenger Terminal	2000	0.2	0.8	400	1600
Administrative building	150	0.2	0.8	30	120
Transshipment area	2000	0.3	1.2	600	2400
C&F	2000	0.2	0.8	400	1600
Residential area	150	0.2	0.8	30	120
Total				1460	5840

- **Expected water demand/requirement**

122. During operation phase expected water demand in the Ramgarh Land Port will be as following:

Table 7: Expected water demand during operation

Building/Unit	Users, no.	Water Use Rate, lpcd
Residence	100	150
Office	100	25
Public Wash Block	100	50
Public Wash Block	50	50

- **Electricity supply**

123. Power supply at the Ramgarh Land Port area will be following:

Table 8: Electricity supply system at the Ramgarh Land Port

Item	Particulars
Overhead Incoming Expressed 11 KV Feeder	<ul style="list-style-type: none"> • 33/11KV Power can be feed from existing 33/11KV Sub-Station at Ramgarh upazila area coming from Hathazari BPDB feeder line which is closed to the project of the proposed land port. • An additional expressed 132/33KV National Gridline is available at Baroirhat to be proposed in future extension for feeding power to the proposed Land port from existing 132/33 KV National Grid line at Broirhat
Power Sub-station	<p>Major components are as follows:</p> <ul style="list-style-type: none"> • Ring Main Unit for 2nos. 11KV Incoming Feeders • Medium Voltage Switchgears (11KV) • Power Transformers of 2nos. 1250KVA, 11/0.415KV, 50Hz, • DYn11, dry type cast resin and maintenance free • Low Voltage (LV) Switchgears and ELT switchgears • Power Factor Improvement Plants

3.5 Key Elements of Master Plan

124. In this proposed planning all the different relevant departments are integrated under one roof. The key elements taken into consideration for finalizing master plan are as follows:

- Transshipment Yard
- Truck Terminal
- Open Stack Yard
- Warehouse
- Visitor Transit Area
- One Stop Service Building

- **Transshipment Yard**

125. Transshipment yard will use to direct transfer of cargo from Indian trucks to Bangladeshi trucks. Indian trucks will unload goods at transshipment yard and return to India afterwards. The facility will be split to be developed in Phase 1 (1,600 sqm) and Phase 2 (1,000 sqm).

- **Truck Terminal**

126. As most of the goods through land ports are transported through trucks it is highly necessary to start with organized truck terminal from the beginning. Terminals for Indian and Bangladeshi trucks are strongly recommended and a provision of 3,200 sqm is planned for these terminals. In Phase 1 terminals for both Bangladeshi and Indian trucks are required to be developed.

- **Open Stack Yard**

127. Open stack yard is useful for staying of non-perishable goods due to relatively less expensive storage space. Such yard needs to be established at the beginning as part of Phase 1 development. Approximately on average 19,000 tons of goods are predicted to be stored in the yard.

128. These are mostly machinery and metallic goods which are imported in bulk and usually take more space than those stored in warehouse. Heavy materials like bricks, stone chips etc. are kept in open air of which 50 per cent are stored and assumed to be kept for two days on average. Therefore, the open stack yard space is recommended to be established with 8,800 sqm.

- **Warehouse**

129. Mainly perishable goods are stored in the warehouse, which are assumed to stay for two-three days. Out of predicted cargo volume by 2050, approximately 5,000 tons are estimated to be warehoused. Therefore, a warehouse with 940 sqm space is planned to be built in Phase 1 and 2,000 sqm in Phase 3 for storing such additional goods.

- **Passenger Terminal**

130. In average daily 10 persons cross the Belonia Border in 2019. Presently there is no passenger traffic at Ramgarh. Annual passenger traffic crossing through Belonia border in 2019 was 24,850. If facilities are provided the passenger movement is expected to rise sharply as it happened in other developed land ports. Passenger traffic in Ramgarh is expected to be around 500 per day, after development of the port. Therefore, a passenger terminal building of with 500 sqm space is recommended to be built in Phase 2 in Ramgarh.

- **One Stop Port Service Building**

131. Ramgarh will need a one-stop service building for smooth operation of the port by integrating the port users i.e. exporters, importers, C&F Agents, transport associations, labors, customs, quarantines, BGB and other port users. For reducing the waiting and travel time of the port users and for streamlining the port services, a one-stop service building is proposed. Offices to be housed by the proposed one stop port service building are-BLPA, Immigration, Customs, BGB, Banks, Labor Union, Labor Contractor, Health Inspection and C&F Agents.

132. The size of the building has been derived from the functional and space requirement of the different offices that will operate in coordination with the port authority. The size of each office is calculated on the basis of 20 sqm per person, multiplied by the number of persons for the target year 2050. A building with 1,300 sqm space is recommended for one stop services.

133. BLPA will make an arrangement with Pourashava waste management system to manage sewage and solid waste management to treat all liquids generated from human excreta and other activities in the land port area during operations.

3.6 Present setup

134. Currently there is no infrastructure of the land port, as it is to be developed from green field. Land acquisition is under process.

3.7 Layout Plan

135. A conceptual layout plan for Phase 1 of Ramgarh Land Port is given below:

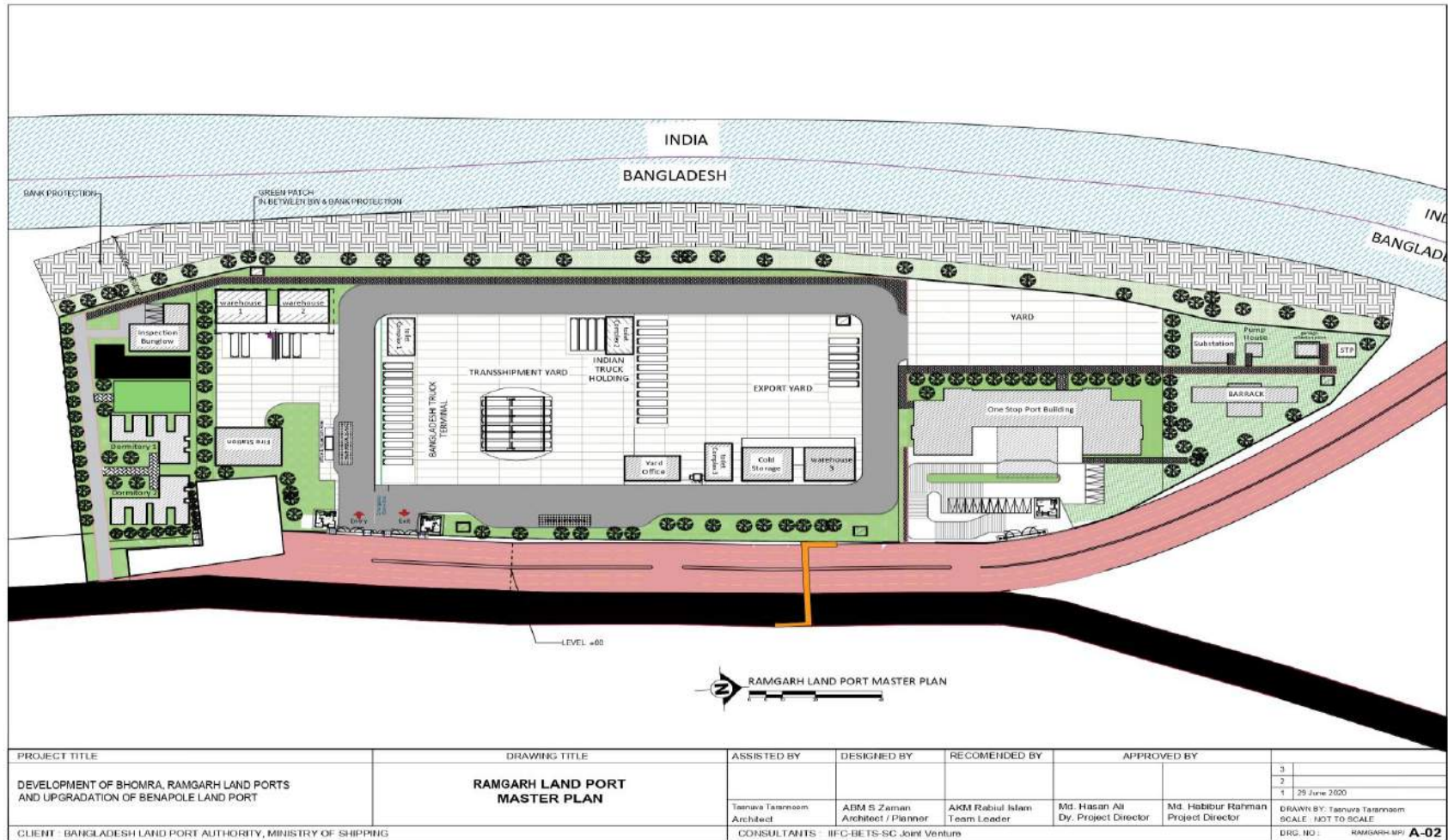


Figure 2: Conceptual layout plan for Phase 1

3.8 Analysis of Alternatives

3.8.1 Alternatives for Location of the Land Port

136. To select the present location of Ramgarh Land Port all the options, traditional design has been analysed to get the most of the benefit. The advantages and disadvantages of options are illustrated below:

137. Traditional

- This type of land port has a wide level of acceptability because both has a long history of using such method of border management;
- Handling of goods/vehicles/labors is more effective and easy in this method;
- Cross border coordination is required at a reduced level;
- Inter-ministerial 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;
- Land custom (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.

138. Co-located or Juxtaposed

- Government of India constructed a bridge from India to Bangladesh over Feni River at adjacent to the project site for easy and only transportation between the two country in this location;
- Ramgarh Land Port site is one of the LC stations and currently a Border Out Post (BOP) guarded by 43 Battalion of BGB. The battalion is under Guimara Sector of BGB in the broader the South East Region. The BOP is on the other side of the road 100 meter from the land port;
- Coordinated effort for transshipment will not be very effective in this pattern due to difference in language, religion, social, nature and behavior of people and truck driver is different of diversity;
- Infrastructure within no man's land is highly restricted by both of the neighboring government.

139. Staggered

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

140. From above analyzation it is found that the proposed location is acceptable for land port development. Besides, in that region of Bangladesh no other land port has been developed yet. So this location is selection is very important for economy of Bangladesh.

3.8.2 Alternatives for Single Modal and Multi Modal Transport

141. At present Ramgarh-Baroirhat Highway is the only option for transportation and no other connectivity in India-Bangladesh cross border.

142. Indian transit traffic and Indo-Bangladesh bilateral traffic regularly travel along two designated Inland Water Transport (IWT) Protocol routes across Bangladesh. These routes are highly underutilized, partly due to rapid siltation, lack of sufficient navigational aids, and partly due to limited number of ports of call (4 ports on either side). There is no inter-country passenger movement by IWT. For Ramgarh, there is little potential for using river route.

3.8.3 Phase Wise Development

143. Ramgarh Land Port will be developed in three phases. Phase 1 development year is 2022-2023 and 10-acre land is planned to be developed. Present study is conducted for phase 1. In Phase 2, 3.30 acres is considered to be taken and developed during 2025-2026. In Phase 3 (during 2032-2034), 7.46 acre is recommended to be developed.

144. For Phase 1, Phase 2 and Phase 3, the essential facilities that need to be operated for the land port are given below.

Table 9: Proposed facilities for all three phases

Phase 1		Phase 2		Phase 3	
<ul style="list-style-type: none"> • Pavement • Permanent Boundary Wall • Internal Road Network • Garbage Bins • Landscaping • Passenger's Over-Pass • One stop Port Building • Ware house • Cold storage • Parking Area • Transshipment Yard Shed • Bangladesh Truck Terminal • India Truck Terminal • Customs Inspection Building • Barrack 	<ul style="list-style-type: none"> • Facilities for Drivers and Labors • Check post for Border • Car Wash and Service Area • Open Stack Yard • Area internal Lighting, road, etc. • Substation Building • Watch Tower • Toilet Complex • Septic tank, soak well • Water Pipe network • Area Drainage • Substation Equipment • Pump House • Weighing Bridge • IT Solution system, Networking, etc. • Security system, CCTV, alarm etc. • Fire detection, Fire protection system 	<ul style="list-style-type: none"> • Bus terminal Bldg. • Transshipment Yard Shed • Dormitory 	<ul style="list-style-type: none"> • External bypass road • Ware house • Heavy stack yard • Bangladesh Truck Terminal • Cargo Handling Facilities 		

145. As part of planning considerations, best practices of different ports in developed countries were studied. In the existing land ports different departments mostly are scattered around the site, which creates a system loss leading to inefficiency. Therefore, in this planning exercise, all the different departments (i.e. exporters, importers, C&F Agents, transport associations, labors, customs, quarantines, BGB and other port users) will be integrated under one roof.

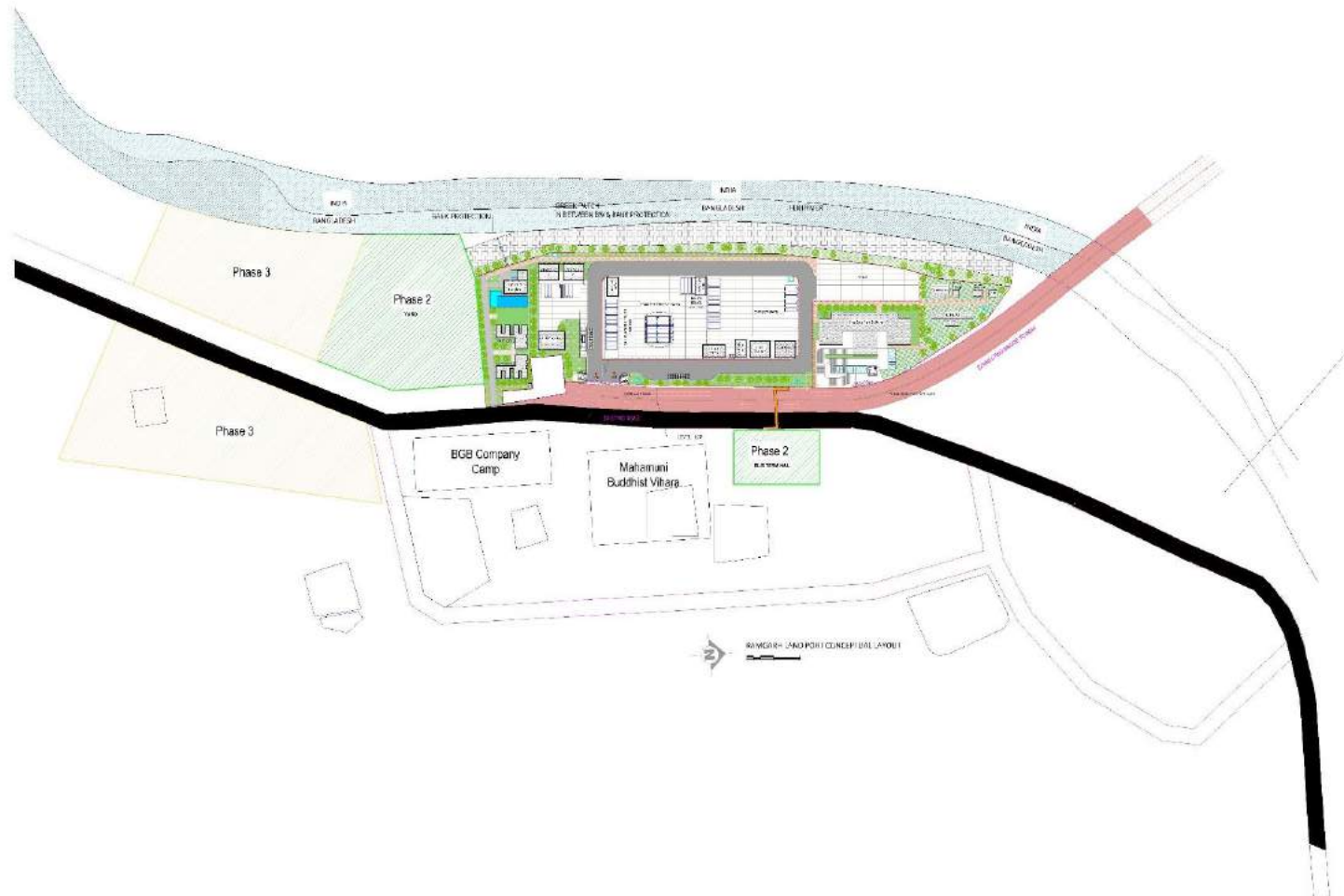


Figure 3: Conceptual layout plan showing area for Phase 1, Phase 2 and Phase 3 development

3.9 Implementation schedule

146. The development is proposed in three phases for ease of implementation and employing resources at the pace of need of growth and expansion. If all the structures are constructed before the target requirement, then land port is likely to have resources remaining idle. Also there are complexities with land acquisition which involves a lengthy process. Therefore, it is recommended for three phases for catering the needs during the periods 2020 -2025, 2025-2032 and 2032-2050.

Table 10: Implementation Schedule

No.	Item	2022												2023											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	Phase 1																								
1.01	Consultancy Services																								
1.02	Land acquisition																								
1.03	Pavement																								
1.04	Permanent Boundary Wall																								
1.05	Internal Road Network																								
1.06	Garbage Bins																								
1.07	Landscaping																								
1.08	Passenger's Over-Pass																								
1.09	One stop Port Building																								
1.10	Ware house																								
1.11	Parking Area																								
1.12	Transshipment Yard Shed																								
1.13	Bangladesh Truck Terminal																								
1.14	India Truck Terminal																								
1.15	Facilities for Drivers and Labors																								
1.16	Check post for Border																								
1.17	Car Wash and Service Area																								
1.18	Open Stack Yard																								
1.19	Area internal Lighting, road, etc.																								
1.20	Substation Building																								
1.21	Watch Tower																								
1.22	Toilet Complex																								
1.23	Septic tank, soak well																								
1.24	Water Pipe network																								
1.25	Area Drainage																								
1.26	Substation Equipment																								
1.27	Pump House																								
1.28	Weighing Bridge																								
1.29	IT Solution system, Networking, etc.																								
1.30	Security system, CCTV, alarm etc																								
1.31	Fire detection, Fire protection system																								
1.32	Social Impacts Mitigation																								
1.33	Resettlement and relocation																								
1.34	Environ. Impact Mitigation																								

4 Environmental and Social Baseline

4.1 Introduction

147. The environmental and social baseline is the existing status of physical, biological and social environmental components of the project area. The main objective of examining the present environment is to provide an environmental baseline against which potential impacts from construction and operational phases of any project can be compared. On this basis the information gathered from various secondary sources and field studies the existing condition of the prevailing environmental status have been identified and presented in following sections. The major sources of noise during the construction phase are vehicular traffic & construction equipment like concrete mixers, cranes, generators, pumps, compressors, etc. The noise produced during construction will have a significant impact on the existing ambient noise levels. The nearby people of the settlements/educational institutes, etc. which are within 1 km either from the project boundary or from the township boundary may feel disturbance created by the construction noise. One km radius area is generally considered as direct influence area because of disturbance created by the project activities during both construction and operation phase and is shown in Figure 4.

148. Position of proposed Ramgarh Land Port is at Mahamuni Para, Word-9, Ramgarh Paurashava of Ramgarh upazila under Khagrachhari Hill District. The following Table and Figure illustrate the summary of various environmental settings and location map with 1km affected area, respectively.

Table 11: Existing environmental settings¹

Particulars	Details	
Location	Mahamuni Para, word-9, Ramgarh Paurashava of Ramgarh Upazila under Khagrachhari Hill District	
Total Area	10 acres	
Site Elevation	Around 19.5 m from MSL	
Surroundings of the project site	North	Bridge from India to Bangladesh
	West	Feni River and India Border
	East	Mahamuni Buddha Bihar and Church
	South	Agricultural land
Agro ecological Zone	Northern and Eastern Hills	
Agricultural Activity	Main crops of Ramgarh Upazila are paddy, sweet potato, ginger, turmeric, sugarcane, bamboo, vegetables and Extinct or nearly extinct crops are local varieties of paddy, Sesame, kaun, mustard.	
Flood	No history of flood.	

¹Field visit, BBS, 2011 & Google Earth

Particulars	Details
Climatic Condition	The annual average temperature of the Khagrachhari Hill District varies from maximum 34.6°C to minimum 13°C and the average annual rainfall of the district is 3031 mm.
Seismic Zone	Zone III, Severe (Seismic co-efficient is 0.28g) (BNBC, 2015, Final draft)
Forests	There is no natural forest surrounding the project area. There is only some homestead vegetation is found nearby the project site.
Major Water Body	Feni River.
Ecologically Critical Area	None.
Environmental and Social Hotspots	River, homestead and natural vegetation, educational institute, religious and historical sites etc.

149. Habitat types in the project and surrounding area are cultivated land, grassland, and water body. Project will not fragment natural forest because there is no forest within 1 km. Natural habitat is found sporadically in very small area (Less than ¼th hector). There are no existing protected areas and no area is officially proposed to be protected by the government nor by the traditional local communities. Land uses in 1 km area is not dependent on predominate tree cover. Land use type within 1 km area and project site is agriculture, grazing and settlements. So, OP 4.04 (Natural habitats) and OP 4.36 (Forests) will not be triggered. Also, there is no natural forest surrounding the project area. There is only some homestead vegetation nearby the project site.

150. Zone of influence for the overall Project is defined as areas that are likely to be directly or indirectly affected by the activities of the project. As the noise and air quality will directly affect the houses, church, etc. within an area of 500m radius from the project. Also, within this area air and noise emission will not be very high. Because, generated noise will not be heard from more than 500 m and air emission will be reduced with distance.

151. Bangladesh has a subtropical monsoon climate characterized by wide seasonal variations in rainfall, high temperature and humidity. On the basis of availability of rainfall and humidity in Bangladesh the whole year is divided mainly into two seasons; dry season and wet season. Dry season is October to March and wet season is April to September. During dry season though rainfall amount is less but dew is generated at night in the atmosphere which helps settle down air pollutants and dust. During wet season small to heavy rainfall usually observed which also settle down atmospheric pollutants. So, along with noise, air pollutants and dust will not disperse more than 1 km from the project area.

152. Besides, there will not have any impact on downstream of Feni River because a riverbank protection embankment on the project site will be constructed at the beginning of land development work and no waste will be discharged into the river.

153. Besides, all necessary measures to mitigate pollution from source will be taken by BLPA authority. So, it is believed that area of influence will not be more than 1 km.

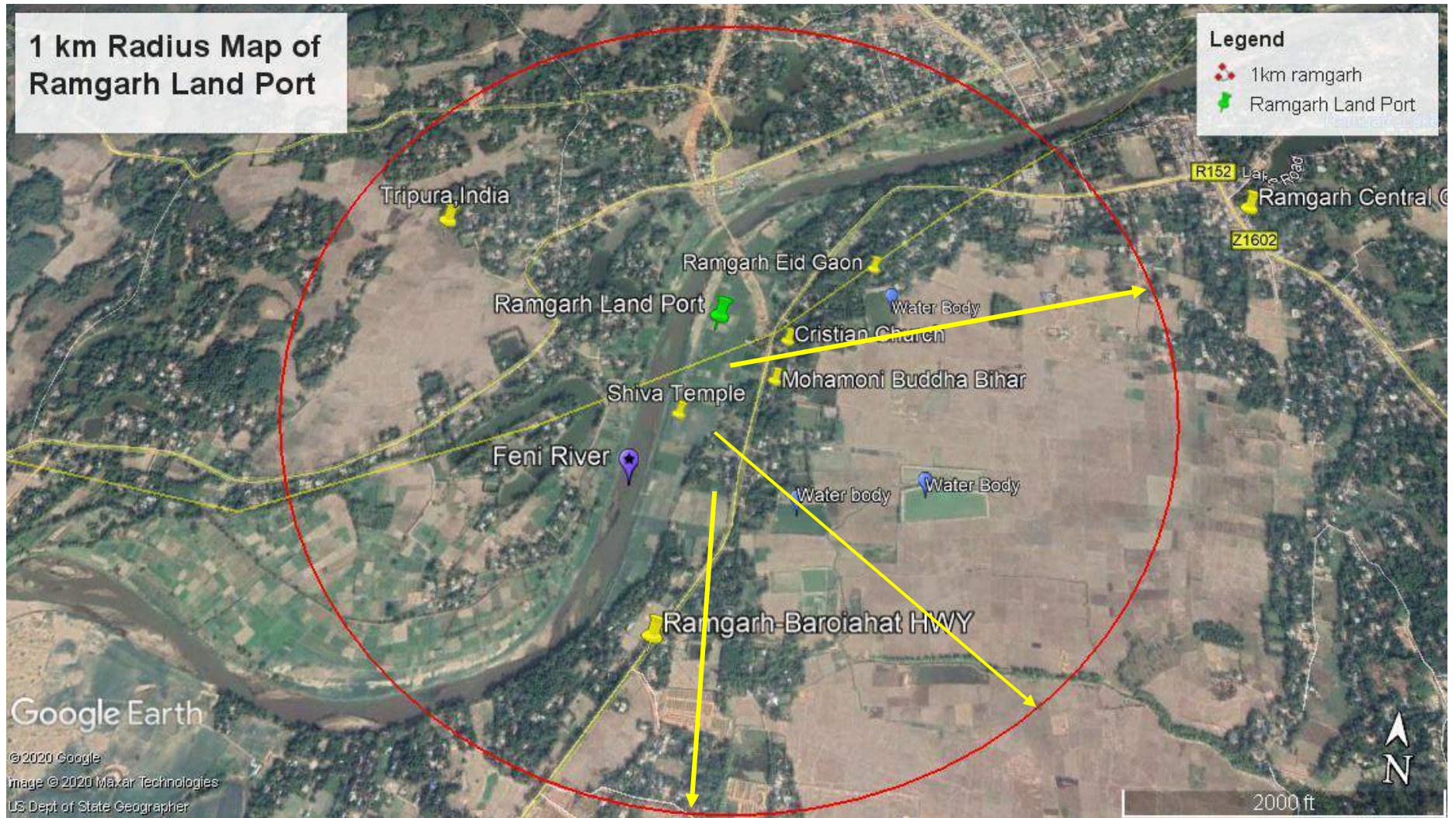


Figure 4: Project location with 1 km radius (in Bangladesh area) influence area

4.2 Meteorology

154. Bangladesh is located in the tropical monsoon region and its climate is characterized by high temperature, heavy rainfall, often excessive humidity and fairly marked seasonal variations. The climatic sub-regions of Bangladesh are presented in the following Figure and as per that, the Ramgarh Upazila of Khagrachhari Hill District falls in climatic sub-region namely South-Eastern Zone. The nearest meteorological station of Bangladesh Meteorological Department (BMD) is at Rangamati. The climatic conditions as recorded at Rangamati are therefore considered applicable for the proposed project. To assess the climatic conditions of the area, climatology data has been collected from BMD.

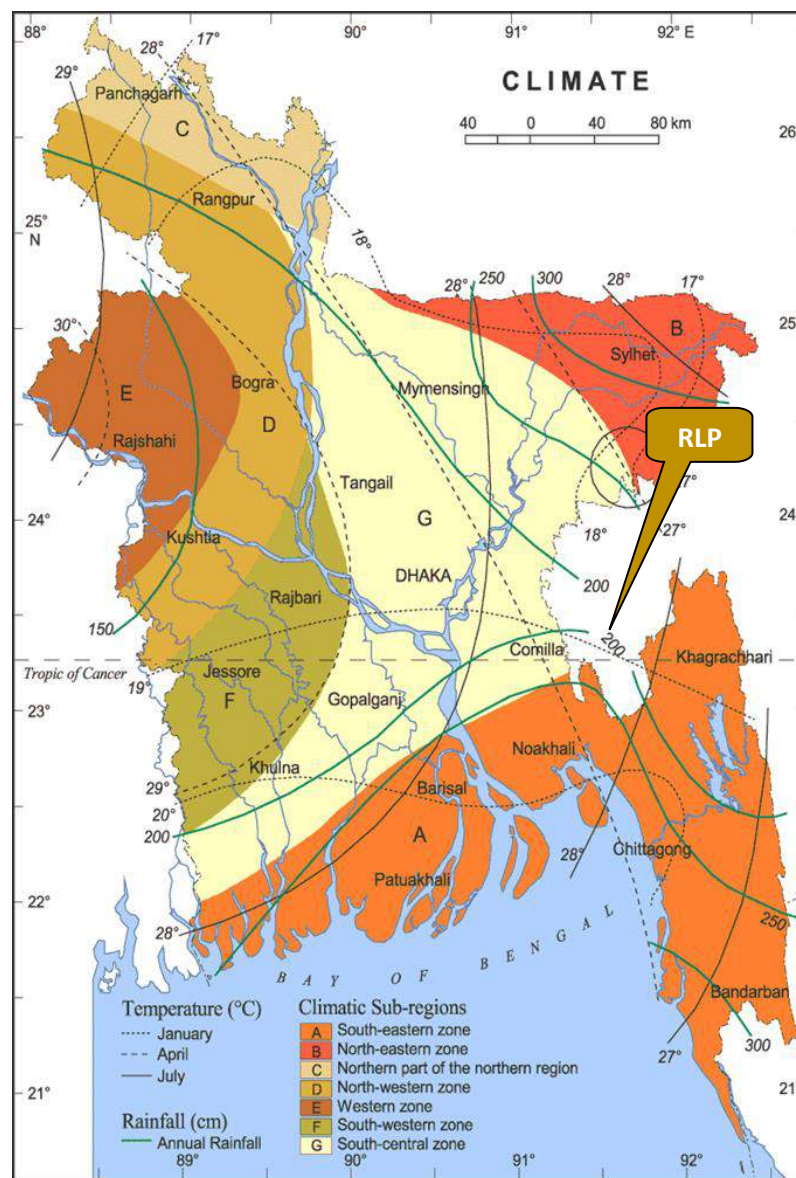


Figure 5: Climatic sub-regions of Bangladesh¹

¹ www.thebangladesh.net

4.2.1 Temperature

155. The period from February to April is marked by continuous increase in the temperatures. April is the hottest month of the year. The annual average temperature varies from maximum to 35.3 °C and minimum 11.2°C, respectively. With the onset of monsoon by mid-May, the temperatures descend slightly. January is the coolest month of the year. The monthly variation of normal maximum and minimum temperatures of the project area from Rangamati station has been given in the following table.

Table 12: Average minim and maxm temperature of Rangamati station¹

Year	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Average minimum temperature (°C)											
2019	11.2	14.3	19.4	23.1	25.7	26.2	25.8	26.3	-	-	-	-
2018	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.4
2017	12.5	15.1	17.8	22.7	24.4	23.5	24.3	24.3	24.0	23.6	20.1	16.1
2016	12.6	16.5	20.6	25.4	24.0	24.5	24.9	24.9	24.7	23.9	18.6	15.8
2015	****	****	17.9	21.8	24.4	25.1	24.4	24.9	24.7	22.8	18.7	14.5
2014	12.2	14.4	18.0	23.8	24.7	25.1	25.4	25.0	24.2	22.7	18.9	15.0
2013	11.7	14.6	18.8	22.7	23.6	25.3	24.8	25.0	24.3	23.1	17.7	14.5
2012	12.3	13.6	19.5	22.2	23.8	24.9	24.6	24.3	24.8	23.1	18.9	13.3
2011	11.6	14.8	18.5	22.1	23.9	24.6	24.4	24.2	24.0	23.1	17.2	15.1
2010	12.4	13.6	20.6	24.7	24.4	24.8	25.3	25.3	24.8	24.2	20.2	14.9
	Average maximum temperature (oC)											
2019	29.0	29.8	32.1	33.8	33.6	33.5	30.8	32.2	-	-	-	-
2018	24.9	29.5	33.1	33.7	32.1	31.7	31.9	32.9	33	30.3	29.4	28.3
2017	20.2	22.9	24.2	27.3	29.2	27.6	27.9	28.5	28.3	27.6	25.2	21.9
2016	25.3	29.7	32.8	33.7	33.5	32.6	31.5	32.1	32.7	32.3	29.0	28.2
2015	****	****	33.6	32.2	33.5	32.2	30.5	31.4	32.4	31.5	29.6	25.6
2014	27.4	28.6	31.3	32.9	34.0	32.2	31.1	30.0	30.9	32.3	30.6	28.4
2013	25.8	30.8	34.8	35.3	31.4	33.3	32.6	31.7	32.6	31.3	29.9	26.7
2012	26.3	30.4	33.1	32.8	33.9	32.1	32.1	32.6	33.1	31.8	28.9	26.2
2011	25.7	30.0	32.9	33.7	33.4	32.1	32.1	31.6	32.3	32.2	29.7	26.6
2010	26.6	29.5	34.2	33.8	32.8	32.2	32.5	32.8	32.4	32.2	30.4	26.6

Note: **** indicates missing data

¹ BBS Yearbook of Agricultural Statistics and Statistical Bulletin

4.2.2 Humidity

156. Due to heavy rainfall and proximity to Bay of Bengal, the humidity levels in Bangladesh remains high. Annual average relative humidity in the project area is around 79%. Humidity fluctuations are stable every year in project areas in view of seasonal humidity change. The difference in the average humidity between respective months is rather small. The monthly variation of humidity patterns from Rangamati station has been given in the following table.

Table 13: Monthly variation of relative humidity (%) of Rangamati station¹

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2019	71	68	71	70	77	77	86	82	-	-	-	-	-
2018	77	68	63	70	77	79	80	75	76	81	74	98	76
2017	75	67	70	77	75	84	85	81	82	80	79	81	78
2016	80	76	71	70	76	77	80	83	83	82	80	78	78
2015	***	***	61	74	78	82	88	85	83	84	82	81	79
2014	77	67	60	62	76	84	80	83	83	82	82	83	76
2013	75	62	63	68	79	82	83	85	84	86	82	82	77
2012	77	63	68	77	77	85	86	83	83	85	83	83	79
2011	77	68	65	72	79	84	85	87	85	85	81	83	79
2010	77	66	63	73	79	85	84	84	84	84	83	82	78

Note: ** indicates missing data**

4.2.3 Rainfall

157. About 80% of the precipitation occurs during five monsoon months (May to September). Minimum precipitations are recorded during the month of November to February whereas average showering does occur in March, April and October. The monthly total rainfall variation and annual rainfall variation in different years has been given in the table below.

Table 14: Monthly total rainfall (mm) in Rangamati station²

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2019	0	36	22	95	215	309	1104	341	-	-	-	-	-
2018	6	0	4	236	291	1037	504	281	342	257	6	0	2964
2017	0	0	108	388	186	1189	684	629	428	159	18	30	3819
2016	3	85	11	29	274	513	405	239	214	139	12	0	2032

¹ BBS Yearbook of Agricultural Statistics and Statistical Bulletin

² BBS Yearbook of Agricultural Statistics and Statistical Bulletin

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
											0		
2015	0	0	52	238	130	562	1035	714	386	213	10	2	3342
2014	0	23	17	1	339	610	161	294	316	152	10	0	1923
2013	2	2	83	435	280	274	200	476	198	0	0	2	1952
2012	0	0	91	284	187	834	489	297	268	344	23	0	2817
2011	1	1	49	78	169	516	463	566	420	98	0	0	2361
2010	0	9	121	112	424	653	304	496	183	281	45	45	2673

4.2.4 Wind Speed and Direction

158. Wind speed estimation is important for pollution dispersion. The direction of wind varies with seasonal changes. Therefore, a whole year has been divided into four seasons and each season is represented with one month for producing the wind rose diagrams (Figures given below). Wind speed data and direction have been collected for Rangamati station.

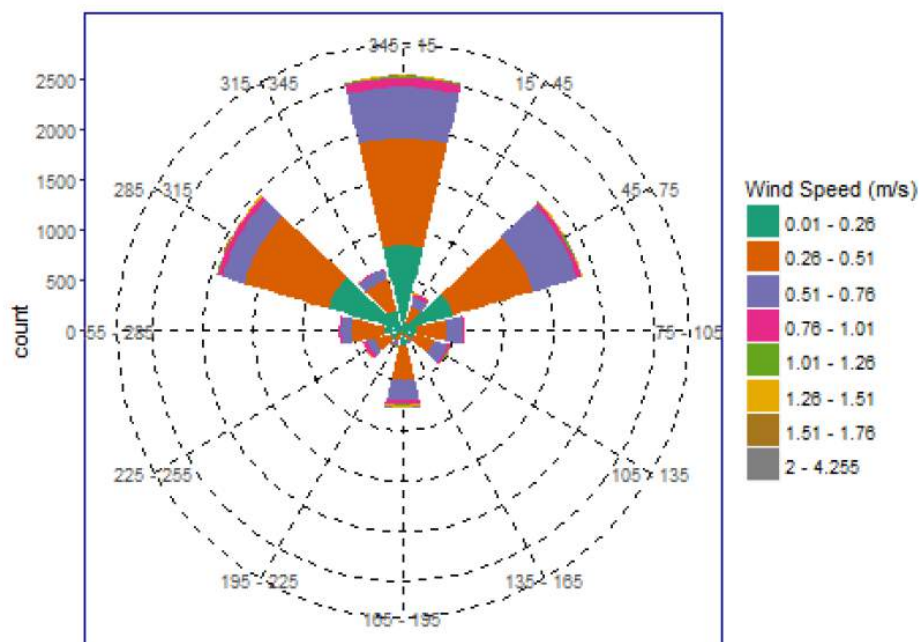


Figure 6: Wind direction and speed of Rangamati during Winter Season¹

¹ M. A. Khatun, M. B. Rashid and H. O. Hygen, Climate of Bangladesh (2016), MET report, Bangladesh Meteorological Department (BMD), ISSN no. 2387-4201

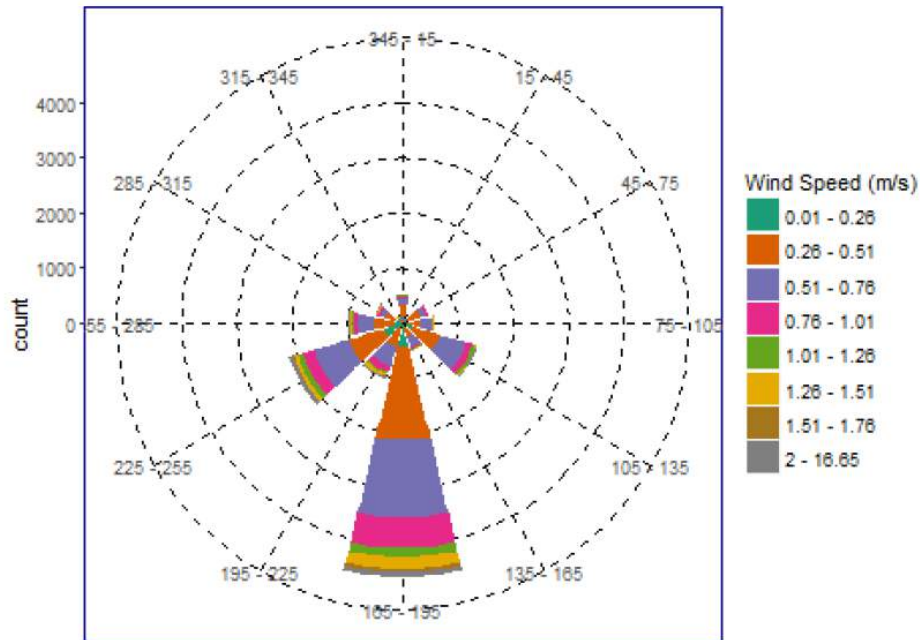


Figure 7: Wind direction and speed of Rangamati during Pre-monsoon Season¹

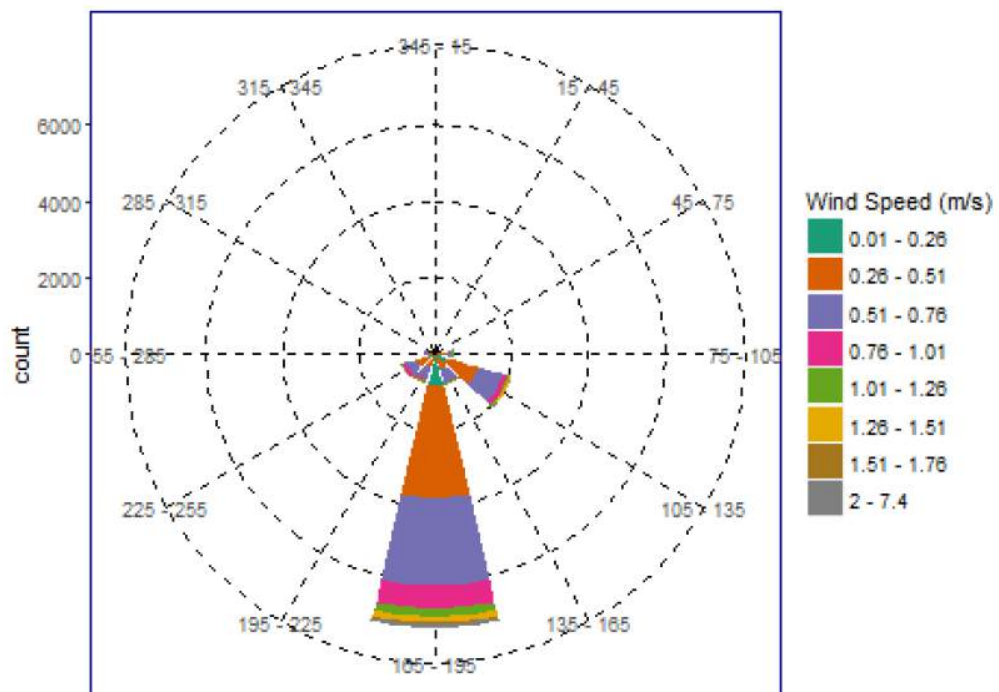


Figure 8: Wind direction and speed of Rangamati station during Monsoon Season²

¹ M. A. Khatun, M. B. Rashid and H. O. Hygen, Climate of Bangladesh (2016), MET report, Bangladesh Meteorological Department (BMD), ISSN no. 2387-4201

² M. A. Khatun, M. B. Rashid and H. O. Hygen, Climate of Bangladesh (2016), MET report, Bangladesh Meteorological Department (BMD), ISSN no. 2387-4201

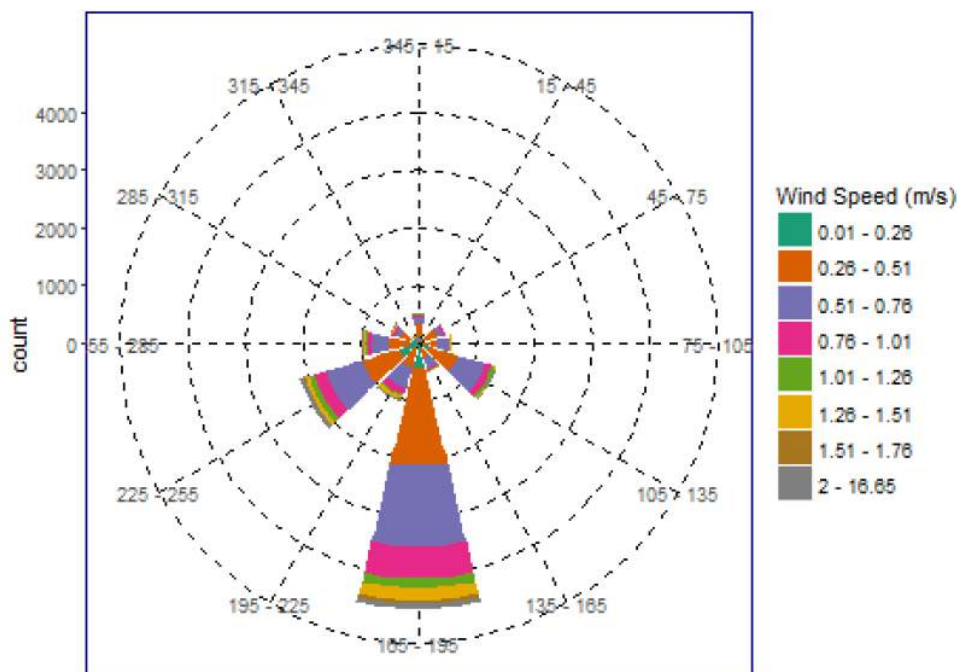


Figure 9: Wind direction and speed of Rangamati station during Post-monsoon¹

159. During high winds, there might be possibility of quick spreading of the dust generated from the construction and operation activities. It is very risky to work during rain and in high winds because the possibility of getting injury increases. Furthermore, work under high temperature and excess humidity is extremely difficult, and may create dehydration problem.

4.2.5 Sun Shine Hours

160. Sunshine duration or sunshine hours is a climatological indicator, measuring duration of sunshine in a given period (usually, a day or a year) for a given location on Earth; typically expressed as an averaged value over several years. It is a general indicator of cloudiness of a location, and thus differs from insolation, which measures the total energy delivered by sunlight over a given period. Sunshine duration is usually expressed in hours per year, or in (average) hours per day. In the project area, December and January is the sunniest month. July and August has the lowest amount of sunshine. The average monthly sunshine hours at the project has been given in the figure below. The graph shows the monthly number of sunny, partly cloudy, overcast and precipitation days. Days with less than 20% cloud cover are considered as sunny, with 20-80% cloud cover as partly cloudy and with more than 80% as overcast.

¹ M. A. Khatun, M. B. Rashid and H. O. Hygen, Climate of Bangladesh (2016), MET report, Bangladesh Meteorological Department (BMD), ISSN no. 2387-4201

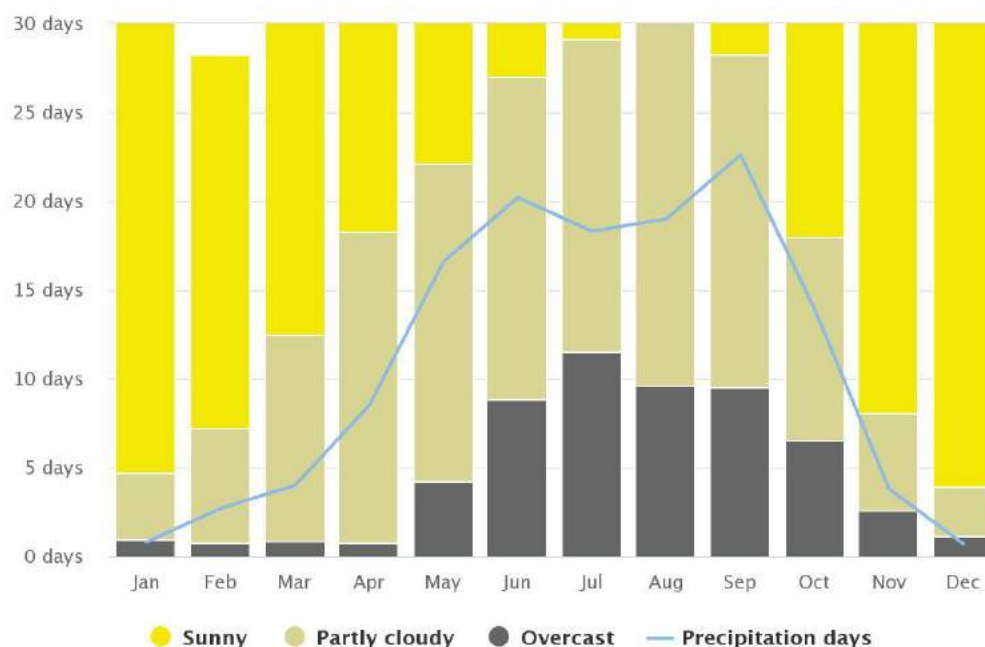


Figure 10: Average monthly sunshine hours in the project area¹

4.3 Ambient Air Quality of the project site

161. Ambient air quality of the Port area has been measured by a third party named Greentech Testing Company Ltd. on 16 February, 2020 (Annex-2). Ambient air quality of the Land Port was monitored for the parameters CO, CO₂, NO₂, H₂O, SO₂, NO, H₂S, VOC, O₂ following continuous emission monitoring system (CEMS) by using air analyzer. The analyzers are designed to meet BS 8494/ EN 50270:2006 standard. CO, NO₂, CH₂O, SO₂, NO, H₂S were monitored using electrochemical method CO₂ was monitored following Non-Dispersive infra-red (NDIR) method. Hydrocarbon and VOC were monitored by plus-in catalytic bead and O₂ was measured by capillary controlled concentration sensor and monitored by using automatic span upon activation. The suspended particulate matter (SPM) of different sizes as PM_{2.5} & PM₁₀ were monitored hand-held particle counter at different sections of the Land Port. The particulate counter utilizes the laser technology for single particle detection. The concentration of particulate matter was measured in microgram per cubic meter. Ambient air quality at the surrounding of the Land Port has been analysed for the concentration of parameters CO, CO₂, NO₂, CH₂O, SO₂, NO, H₂S, and VOC & O₂. The concentration of Suspended Particulate Matter (SPM) of different sizes within the range of 1.0 µg/m³ -10 µg/m³ has been measured from the analysis and shown Table 15 below.

¹ Meteoblue, (https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/r%4%81mgarh_bangladesh_1185129)

Table 15: Ambient Air Quality of the project site

Land port surrounding location	PM _{2.5}	PM ₁₀	Total SPM	National Standard (ECR, 97)			Remarks
				Total Suspended Particles			
				Industrial mixed	Commercial mixed	Residential Rural	
North	83	96	179	500	400	200	Within acceptable limit
South	82	95	177				
East	83	96	179				
West	90	103	193				
Middle point	80	93	173				

162. It has been observed that the value of CO, CO₂, NO₂, CH₂O, SO₂, NO, H₂S, and VOC & O₂ are within maximum permissible limit of ECR 97, US EPA and OSHA guidelines.

163. Bangladesh has a subtropical monsoon climate characterized by wide seasonal variations in rainfall, high temperature and humidity. On the basis of availability of rainfall and humidity in Bangladesh the whole year is divided mainly into two seasons; dry season and wet season. Dry season is October to March and wet season is April to September. During dry season though rainfall amount is less but dew is generated at night in the atmosphere which helps settle down air pollutants and dust. During wet season small to heavy rainfall usually observed which also settle down atmospheric pollutants. So, along with noise, air pollutants and dust will not disperse more than 1km from the project area.

4.4 Ambient Noise Level of the Project Site

164. Data indicates that the existing noise levels in proposed area are within the range of Bangladesh Environmental Quality Standard as well as WB General EHS Guidelines, 2007 for residential zone. This report uses the primary data as baseline data of noise environment.

Table 16: Noise level in the project area

Location	Site Condition	Noise level dB(A)	Noise Standard dB(A) according to ECR 97 (amended 2007)	
			Day	Night
Project West Side	Running Condition	47.8	75	70
Project East Side	Running Condition	61.2		
Project South Side	Running Condition	68.5		
Project North Side	Running Condition	63.8		
Project Middle site	Running Condition	68.3		

165. The baseline noise environment in the project area measured by a third party named Greentech Testing Company Ltd. on 16 February, 2020 (Annex -3) was

within the range accepted by Bangladesh Environmental Quality Standard (Noise Pollution (Control) Rules, 2006).

166. Normally sound intensity level is decreased with distance. The General formula used for measure the sound level in different distance is given below:

$$L_2 = L_1 - \left| 10 \log \left(\frac{r_1}{r_2} \right)^2 \right|$$

Here, r1= Primary distance in meter

r2=Secondary distance in meter

L1= Sound level in r1 distance

L2= Sound level in r2 distance

167. At day time noise level standard in Bangladesh for commercial area is 70 dBa. Table 16 is provided noise level before start construction work. The noise level will increase due to construction and project activities. If it is assuming that within 1m distance noise level will be 100 dBa than the decrease of noise level will be following:

Distance (m)	Noise level (dBa)
1	100
50	66.02
100	60.00
150	56.47
200	53.97
250	52.04
300	50.45
350	49.12
400	47.96
450	46.94
500	46.03

168. From above noise levels it is found that after 500m impact of noise will be negligible and after 1km there will be no noise impact.

4.5 Water Quality

169. Khagrachari Hill District of Bangladesh and the Tripura state of India is primarily an agrarian area. The economy of these areas is based of cottage industries and agriculture.

170. There is no remarkable industries in the upper riparian area of Feni River and the river slope is comparatively high and only during rainy season the river has flowing water with high velocity. During the dry season the rivers remains almost dry. Besides the land port will not produce any effluent. Hence water pollution of this area due the development of land port is not significant.

171. Two types of surface water are found in the Ramgarh upazila and its adjoining areas. One is pond water and other is river and creeks. Water sampling and analysis were undertaken to understand the overall baseline water quality characteristics of

the surface and groundwater in the project area. The surface water sampling was based on the identification of the major surface water body and its interaction with the project. However, the team collected two surface water samples and tested. One is from Feni River and the other from nearby pond. The test results are shown in (Annexure-4). From the report is revealed that all the parameters are within the acceptable limit. Major constituents of water & safe limit/maximum safe limit of drinking and Irrigation waters shown in Table 17 below.

Table 17: Surface and Ground Water Quality with safe limit/maximum safe limit

	pH	EC	TDS	As	Fe	Ca+ Mg	Total Alkalinity	Total Hardness	Po ₄
Surface Water									
Feni River	7.3	170	86	0	0	17	100	72	0.4
Pond	7.0	180	90	0	0	15	110	67	0.2
Ground Water									
DTW-1	6.5	134	67	0	0	9	110	45	0.2
DTW-2	6.2	135	67	0	0	10	120	40	0.2
Safe limit/Max. Safe limit									
For drinking water	6.5-8.5	250 mu/cm	100 mg/l	50 ppb	0.3 mg/l	---	120 mg/l	150 mg/l	6 mg/l
For irrigation water	6.5-8.5	2250 mg/l	200 mg/l	2 mg/l	5.0 mg/l	---	----	----	10 mg/l

172. It is to be noted that Bangladesh Agricultural Development Corporation (BADC) has developed a Computer Readable Groundwater Management Tool known as Groundwater Zoning Map in technical support of BUET. Latest up dated map of it is shown below.

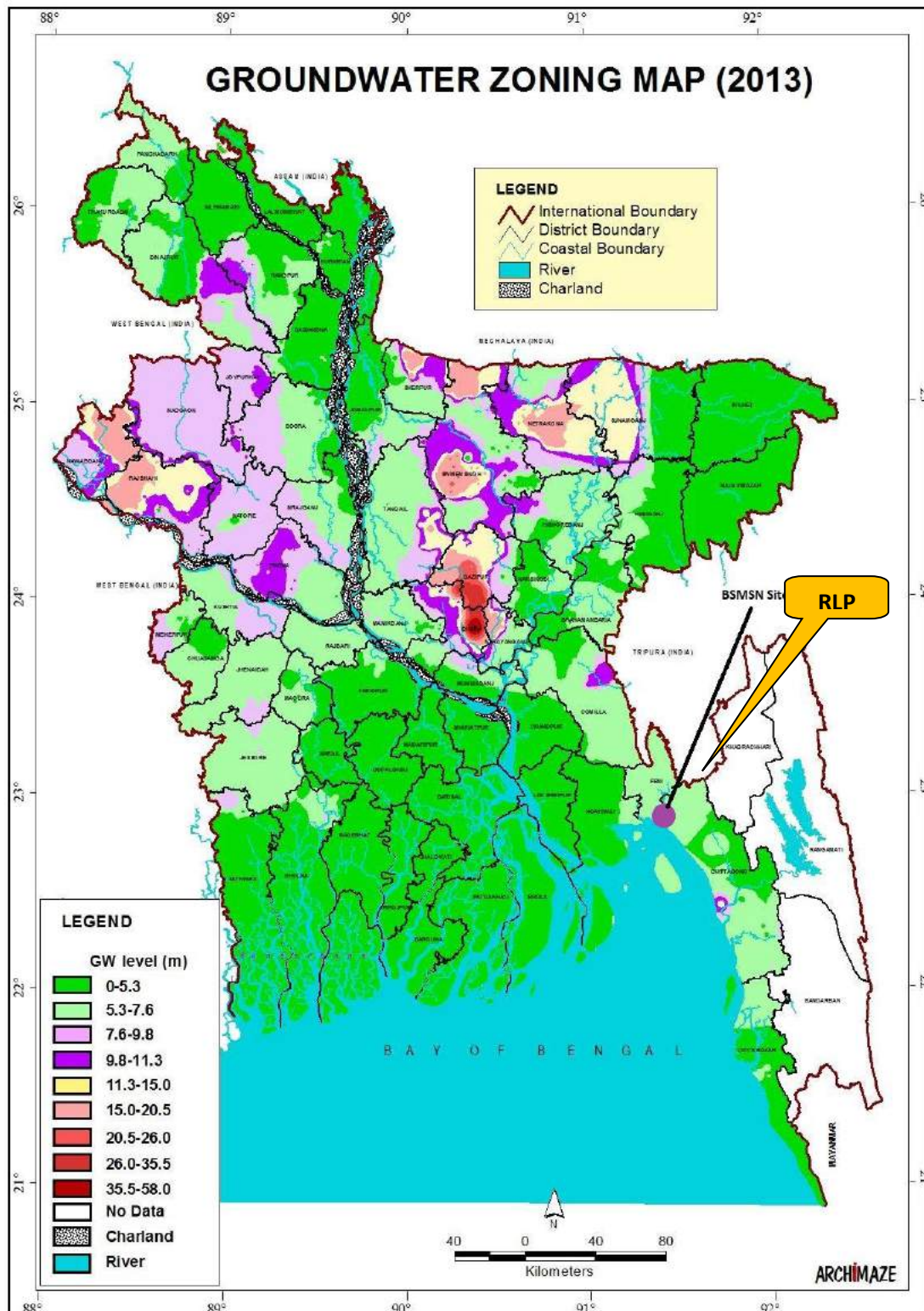


Figure 11: Groundwater Zoning Map of Bangladesh¹

¹ Final Report on Reduced Level (RL) Detection of Deep Tube Well and Shallow Tube Well, BADC, 2015

173. It is to be also mentioned that this tool has been developed for the critical area of ground water level depletion. This land port area is beyond the critical area i.e. in Chattogram Hill Tract area (shown as white colour) where comparatively less number DTWs operate.
174. Recharge of groundwater in the project area occurs by slow vertical percolation of rain water, seepage loss of the run-off of the rivers and stored water in lake, streams, creeks, etc in groundwater. There is net groundwater inflow from the uplands to the west which may be a main source of recharge. Recharge begins from the month of May peaks during August; the upper water bearing horizons quickly become saturated.
175. From the Groundwater Monitoring report of BADC it is seen that the groundwater level fluctuates from 2.79 - 5.60m in Feni Automatic groundwater level recorder (the nearest Recording Station).
176. From the above-mentioned data and information, it is revealed that Deep Tube Well (DTW) to be sunk in project area will not affect the environment. Moreover, the project area is about 2 km away from Upazila headquarter where a few DTW are in operation. As per Groundwater Ordinance 1985 the DTW in project area (DTW to DTW minimum distance 2500 ft.) will not affect the nearby tube well.

4.6 Geology

4.6.1 Physiography

177. The project area is falls under Northern and Eastern hills region of Physiographical Classification of Bangladesh. This region includes the country's hill areas. In the Chattogram region, this unit includes the Sitakunda and Mara Tong ranges and the complex of hills to the south and east of Ramgarh, including the eastern part of the Middle Feni river valley. ¹

¹ Banglapedia, 2020

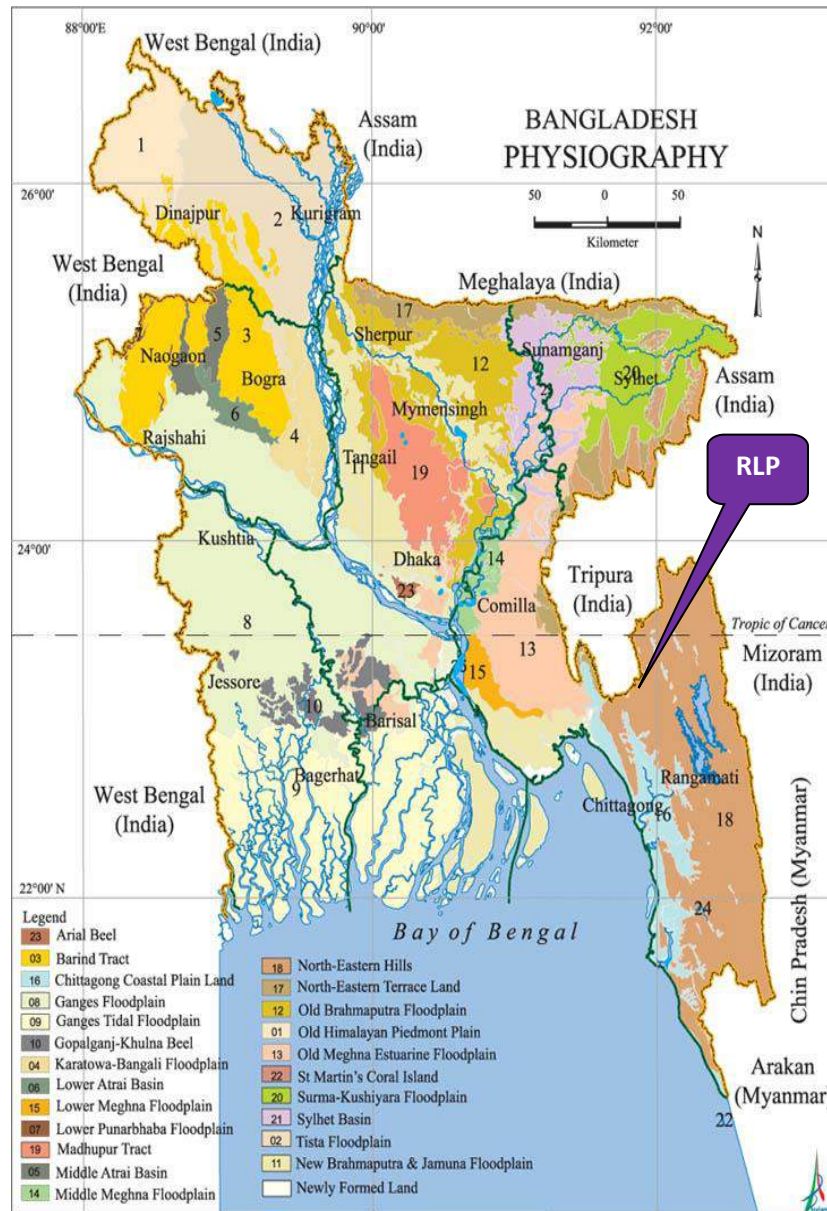


Figure 12: Physiography of Bangladesh¹

4.6.2 Soil Regions

178. In this region, hills have been dissected to different degrees over different rocks. In general, slopes are very steep and few low hills have flat summits. The major hill soils are yellow-brown to strong brown permeable friable loamy, very strongly acidic and low in moisture holding capacity. However, soil patterns generally are complex due to local differences in sand, silt and clay contents of the underlying sedimentary rocks and in the amount of erosion that has occurred. Brown Hill soils are the predominant general soil type of the area. Organic matter content and general fertility level is low. ²

¹ Banglapedia, 2020

² BBS Agricultural Year Book, 2018

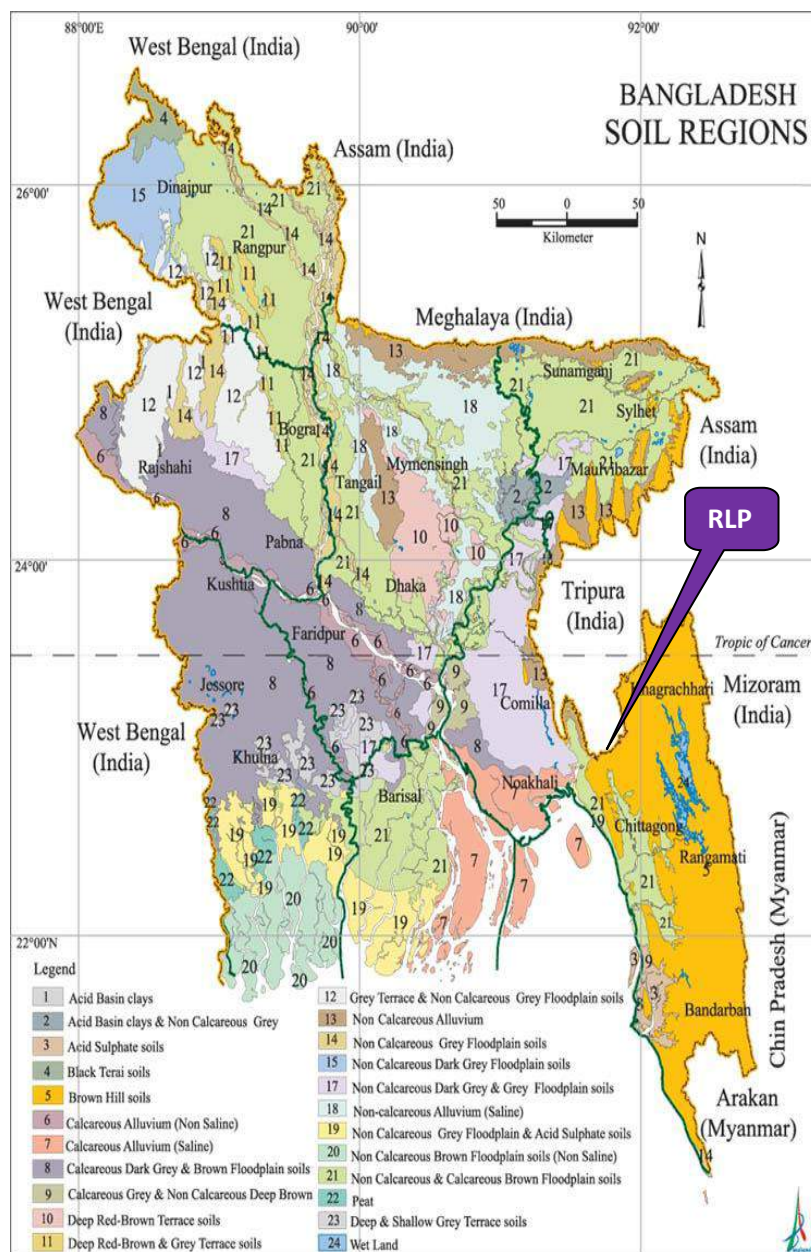


Figure 13: Soil regions of Bangladesh¹

4.6.3 Tectonic Setting

179. Bangladesh consists of following elements:

1. Himalayan Fore deep
2. Rangpur Saddle
3. Stable shelf
4. Hinge zone
5. Madhupur-Tripura Threshold
6. Tripura Uplift
7. Surma Basin

¹ Banglapedia, 2020

8. Faridpur Trough
 9. Barisal Gravity High
 10. Hatiya Trough
180. The Proposed Project area falls in western fault belt of the Indo-Barma Orogeny near Tripura Uplift. This area is nearby of the Barisal Gravity High and Hatiya Trough (Figure showing below).

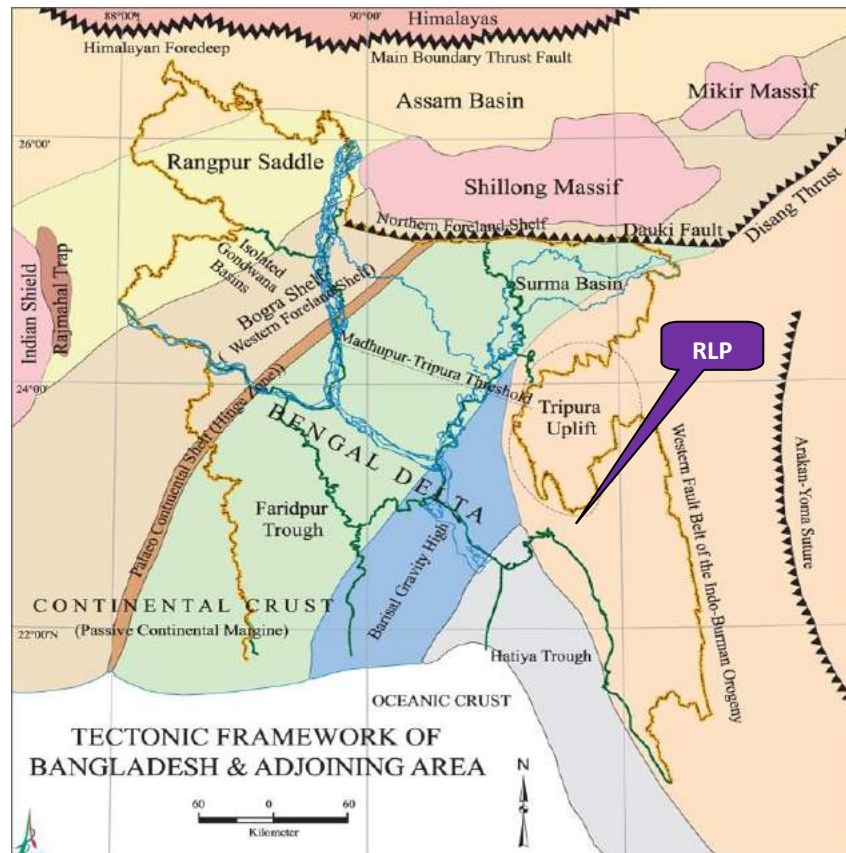


Figure 14: Tectonic setting of Bangladesh and surrounding¹

4.7 Natural Hazards

4.7.1 Seismicity

181. Seismic structural strength assessment of existing buildings, strengthening of existing proposed foundation system and superstructures of critical structures, incorporation of liquefaction potential criteria in the structural design process for structures and other related considerations are to be kept in mind. A preventive measure can be coordinated by ensuring anti-seismic design (end bearing pile foundation including bored or driven piles and use reinforced concrete raft for shallow foundation), quality control (selection of adequate material and appropriate workmanship) under expert supervision. Project site lies in the seismic zone III which is also called severe intensity seismic zone with basic seismic coefficient of 0.28g. Having location in Zone-III, the land buildings and land-based structures for this Project should be designed according to BNBC, 2015. Where the

¹ Banglapedia, 2020

probable imposed loads (mass) at the time of earthquake are more correctly assessed, the designer may go for higher percentage of live load.

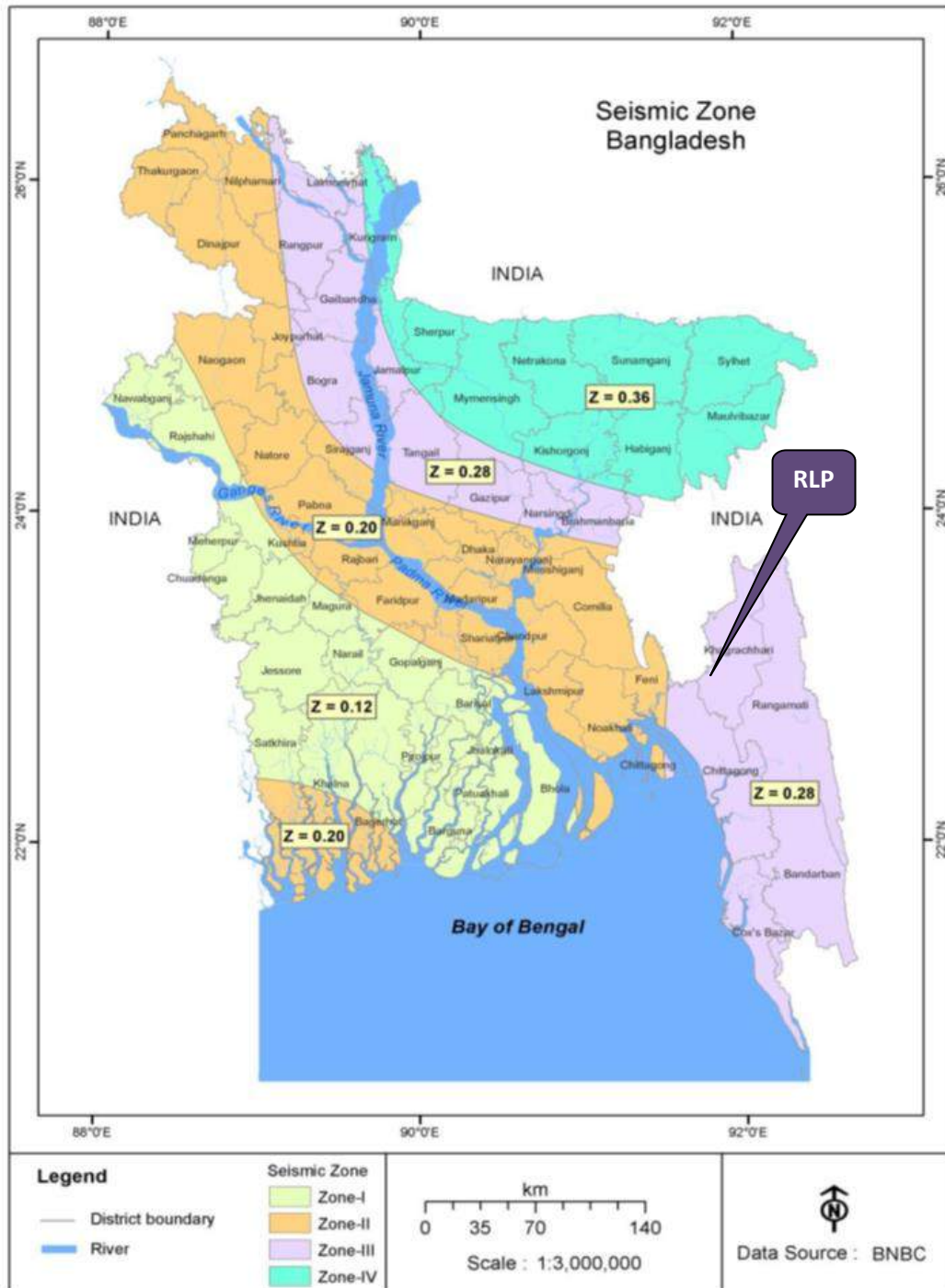


Figure 15: Seismic zones of Bangladesh

4.7.2 Flood and Cyclones

182. Khagrachhari Hill District is a flood free area. From the map of flood affected area of Bangladesh is found that there is no possibility of any types of flood.

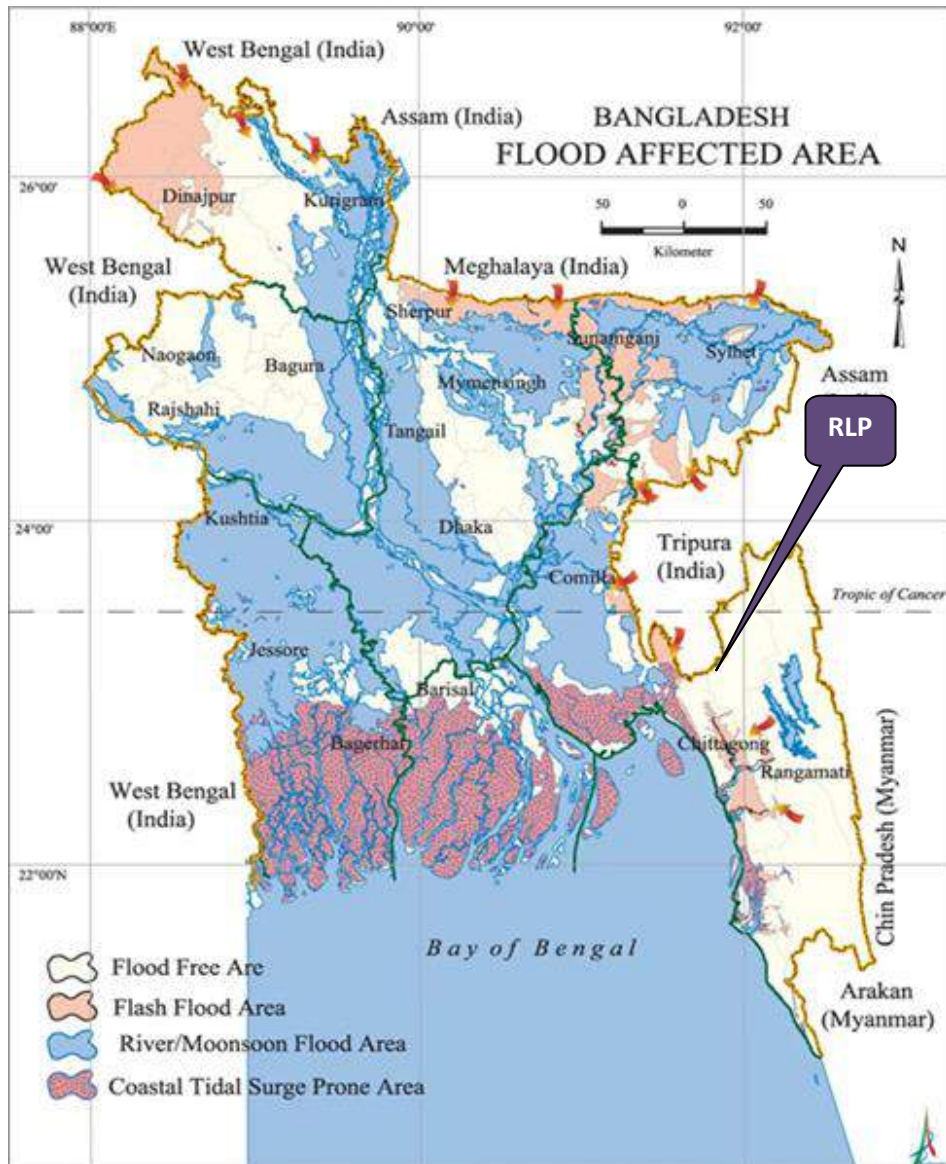


Figure 16: Position of project at flood prone areas of Bangladesh¹

¹ www.thebangladesh.net

183. Cyclone affected map of Bangladesh also shows that the proposed project is located cyclone risk free area. But the area is fall under high wind area due to cyclone.

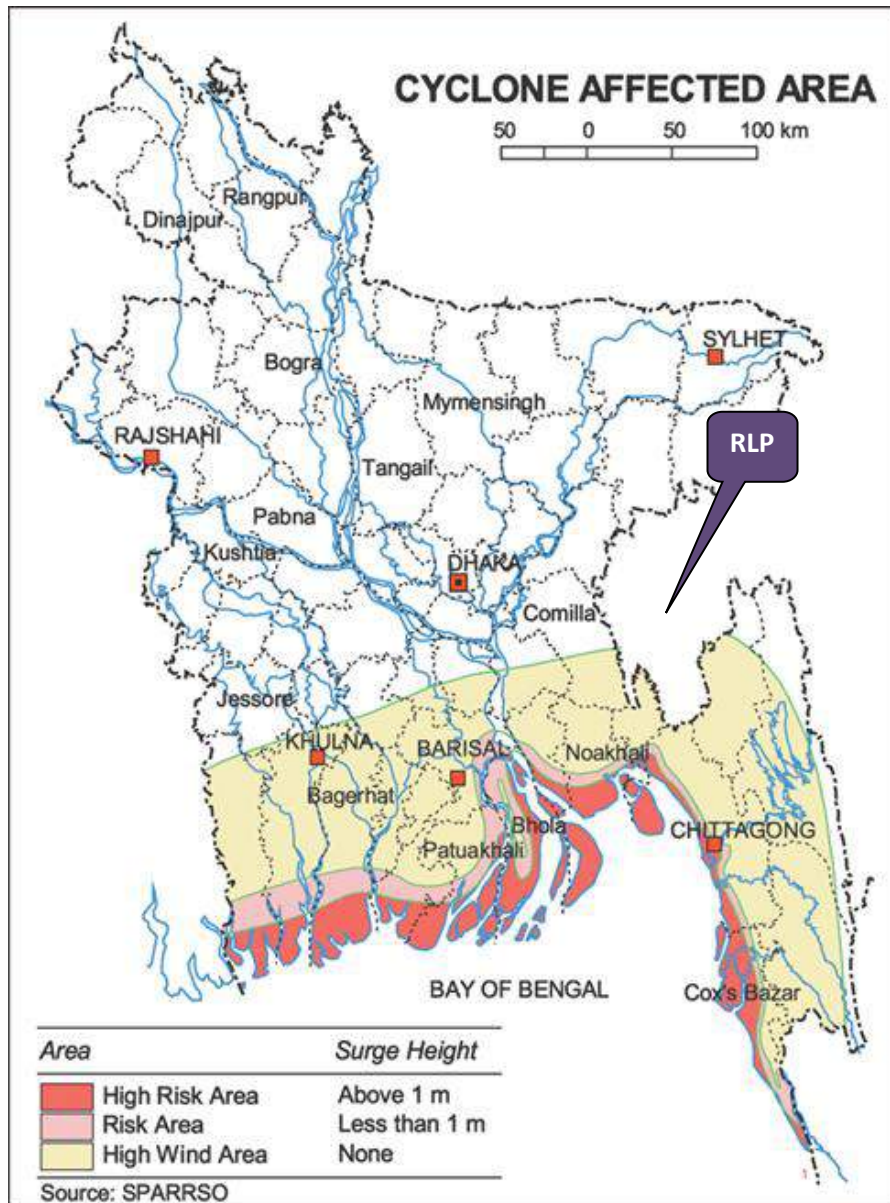


Figure 17: Position of project at cyclone affected areas of Bangladesh¹

¹ SPARSO

4.7.3 Salinity

184. Project area is free from salinity. Because of higher position from sea level there is no possibility of salinity to be found in water or soil of the project area.

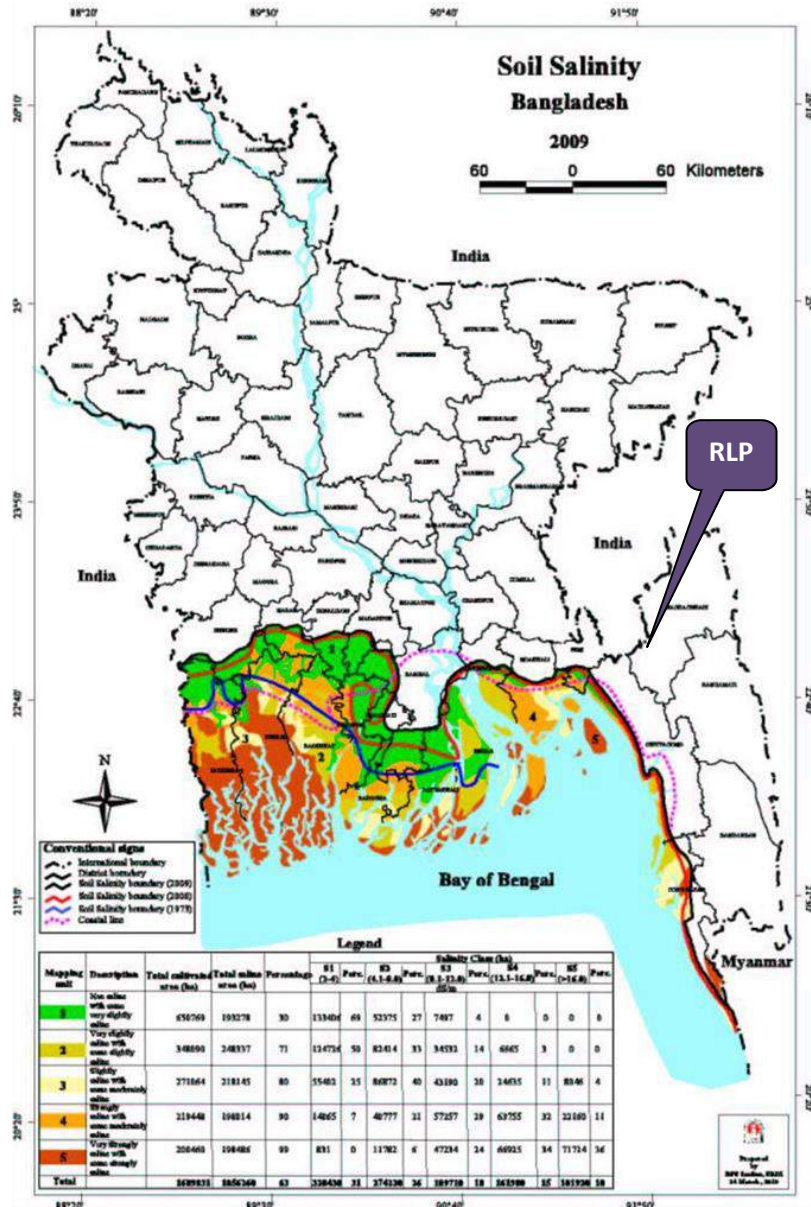


Figure 18: Saline zones of Bangladesh¹

4.7.4 Drainage Congestion and Water Logging

185. Project location is mainly hilly area with slope. Besides, there is Feni River in the western side of the project. So, naturally the area is well drained and there is very little chance of water congestion of this area. If proper drainage system is developed, the inside of the project area will be free from water congestion.

¹ SRDI

4.7.5 Erosion and Sedimentation

186. The River erosion map of Bangladesh indicates that the proposed project area is free from risk of River erosion which is given in following Figure.



Figure 19: Erosion prone areas of Bangladesh including the project area

4.7.6 Changes of River Morphology

187. Figures below show the river morphology of Feni River from 2001 to 2019 from Google Earth. From the Figures it is found that, there are no major changes of river flow direction. But there is some river bank erosion (minor) is observed in some places.



Figure 20: Google map showing the Feni River course, 2001



Figure 21: Google map showing the Feni River course, 2012

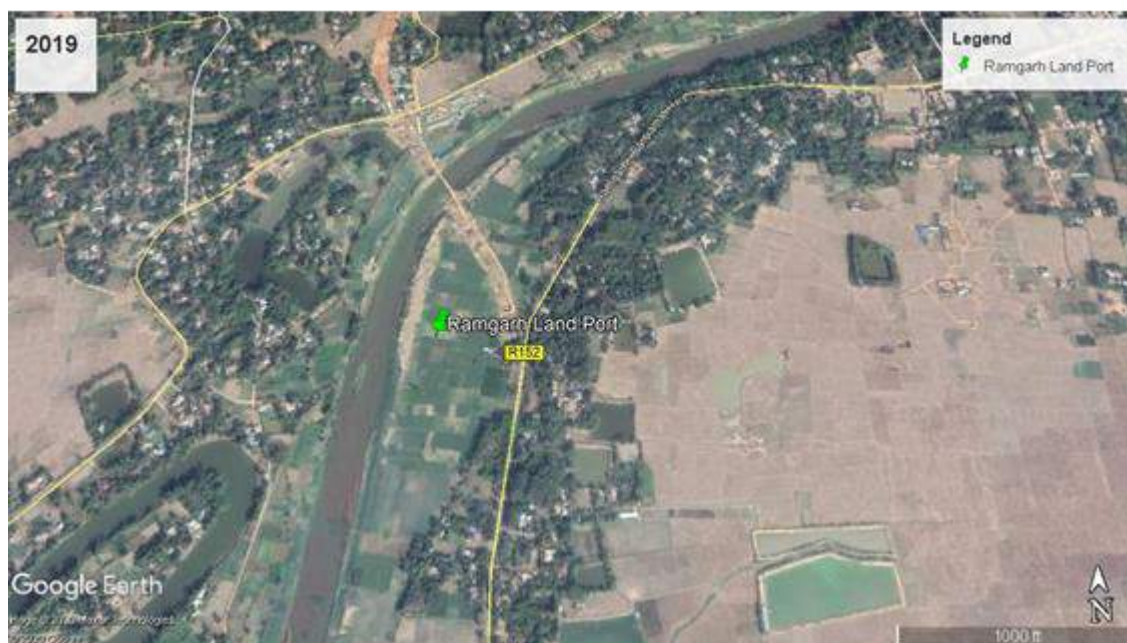


Figure 22: Google map showing the Feni River course, 2019

188. From the above imagery it is observed that there is no river bank shifting tendency of Feni River from 2001 to 2019. The Feni River originates in South Tripura district and flows through Sabroom town and then enters Bangladesh. Muhuri River, also called Little Feni, from Noakhali District joins it near its mouth. The river is navigable by small boats as far as Ramgarh, about 80 kilometres (50 mi) upstream in rainy season. The soil texture is clay with silty high land and no tidal effect is found on this river; so nearly 60 years backward no significant shifting tendency occurred. The shape and direction of River also did not change. The Indo-Bangla friendship bridge which is now under construction on the Feni River will not affect the river morphology as well as erosion and sedimentation as the bridge has free side of about 25-30 m on both the banks of the river.

4.8 Agro-ecological regions

189. Agro-ecological Zones are land areas categorized on the basis of four elements such as physiography, soils, land levels in relation to flooding and agro-climatology. Physiography forms the primary element in defining and delineating the agro ecological regions in Bangladesh. Soils form the second element in defining and differentiating agro ecological zones as soil conditions determine important properties for Port area growth, moisture supply, root aeration and nutrient supply. The third factor is land level in relation to flooding. The last one is related to different agricultural products for different climatic conditions of the regions.¹

190. The agro-ecological zones of Bangladesh have been divided in 30 regions. The proposed project falls under the Northern & Eastern Hills Zone. This region includes the country's hill areas. Relief is complex. Hills have been dissected to different degrees over different rocks. In general, slopes are very steep and few low hills have flat summits. The major hill soils are yellow-brown to strong brown permeable

¹ Banglapedia, 2020

friable loamy, very strongly acidic and low in moisture holding capacity. However, soil patterns generally are complex due to local differences in sand, silt and clay contents of the underlying sedimentary rocks and in the amount of erosion that has occurred. Brown Hill soils are the predominant general soil type of the area. Organic matter content and general fertility level is low.¹

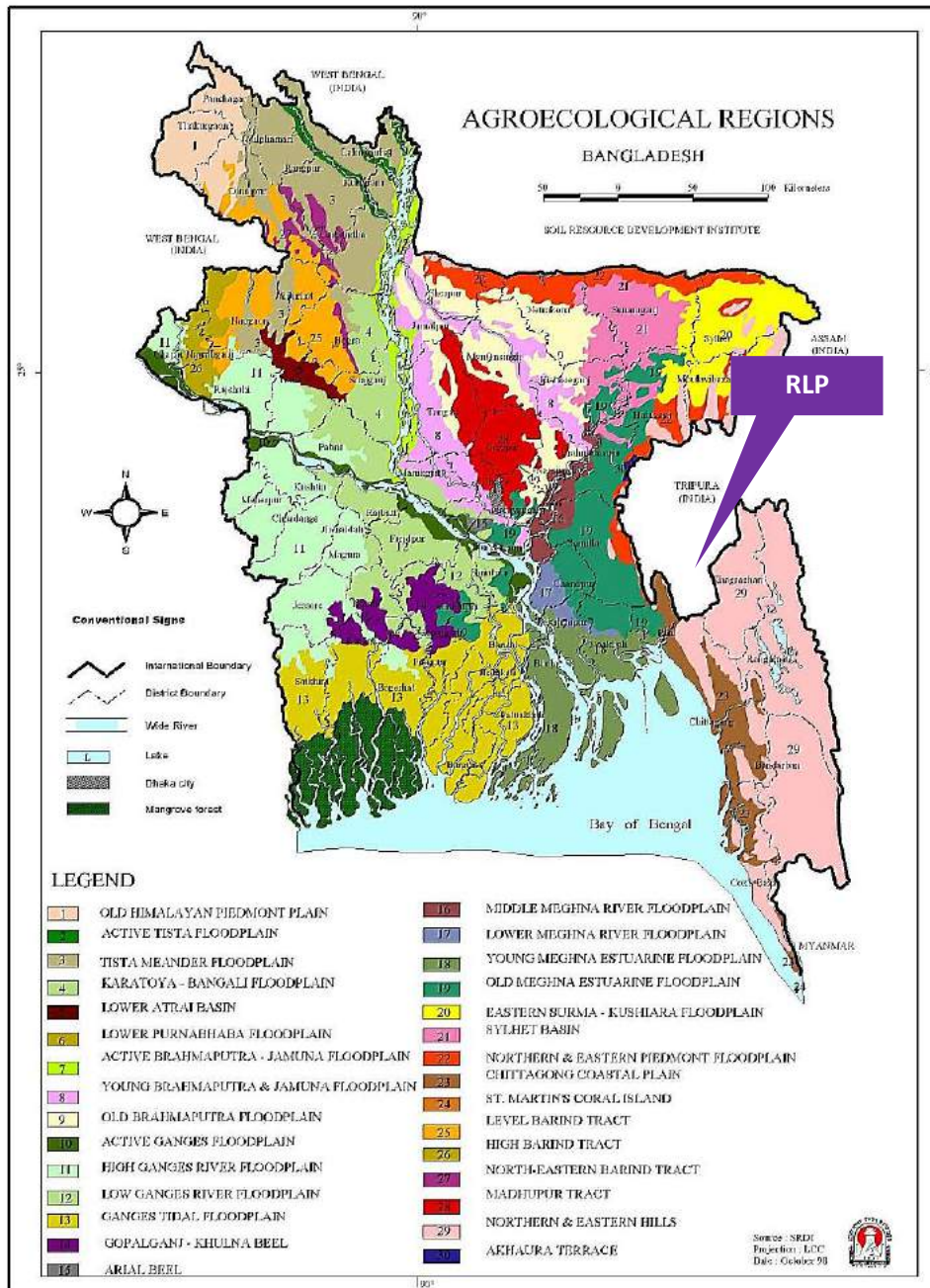


Figure 23: Agro-ecological regions of Bangladesh

4.8.1 Land Types

191. The inundation land type of proposed project is high land. So this area is free from any flooding and this area is above normal inundation level. Following map shows

¹ BBS Yearbook of Agricultural Statistics, 2018

the position of proposed project in inundation map of Bangladesh.

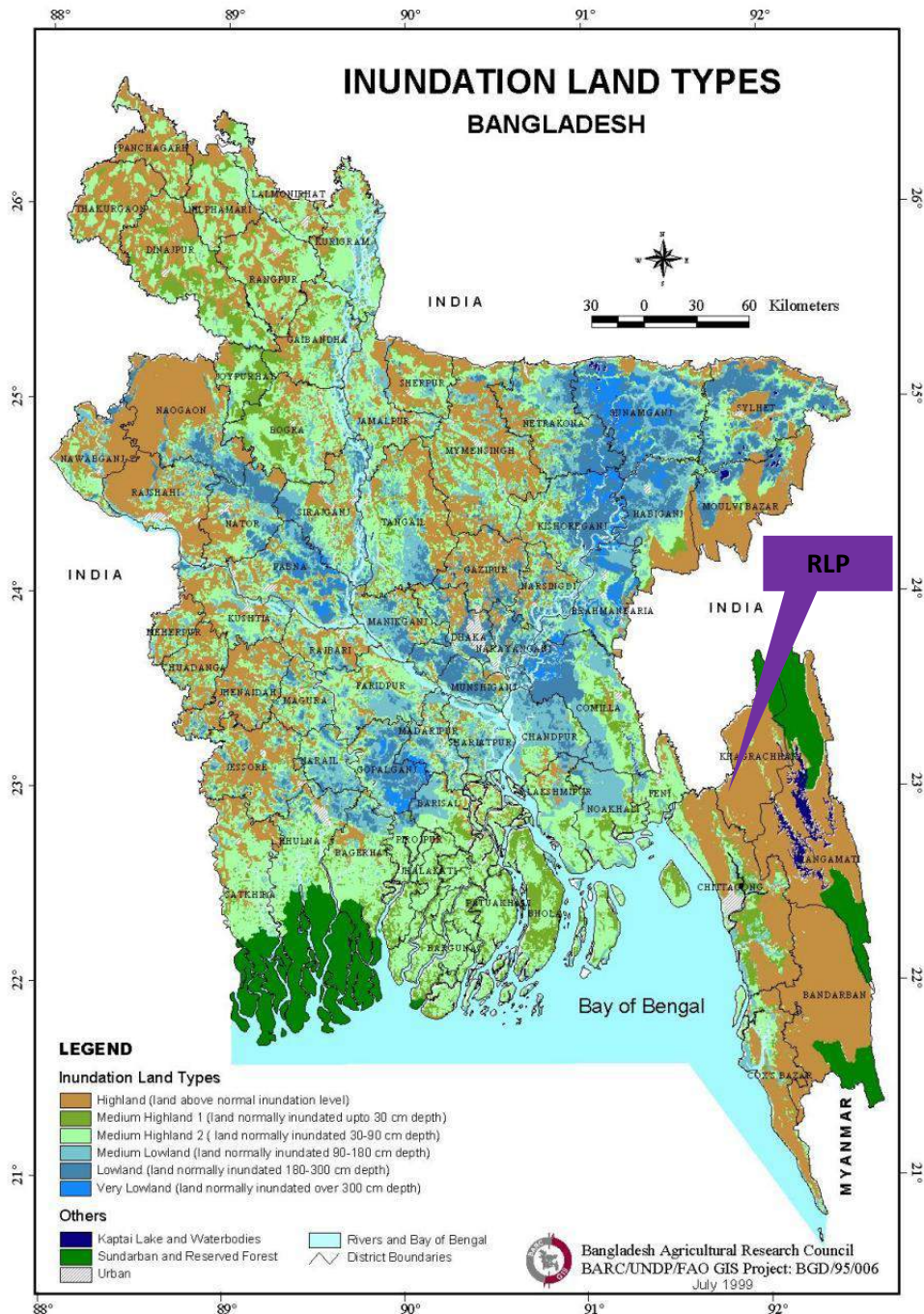


Figure 24: Land types map of Bangladesh indicating the project site¹

4.8.2 Land Use

192. Project area is mainly hilly area and composition of three types of forest-tropical evergreen, semi evergreen and deciduous. Among them deciduous forest is prominent and always mixed with the evergreen species. There are some water bodies (River, Ponds, etc.) and other infrastructure. Total area of Ramgarh Upazila is 287.89 sq km whereas 152.44 sq km is forest area (BBS, 2011). Calculating from BBS

¹ Bangladesh agricultural Research Council (BARC)

District Statistics of Khagrachhari (2011), it is found that approximately 46.7% area is plain land, 53% area is reserve forest and 0.3% area is river area of Ramgarh Upazila. Following figure shows the agricultural land use map of Bangladesh. From land use map it is found that land use pattern for study area is deciduous forest.

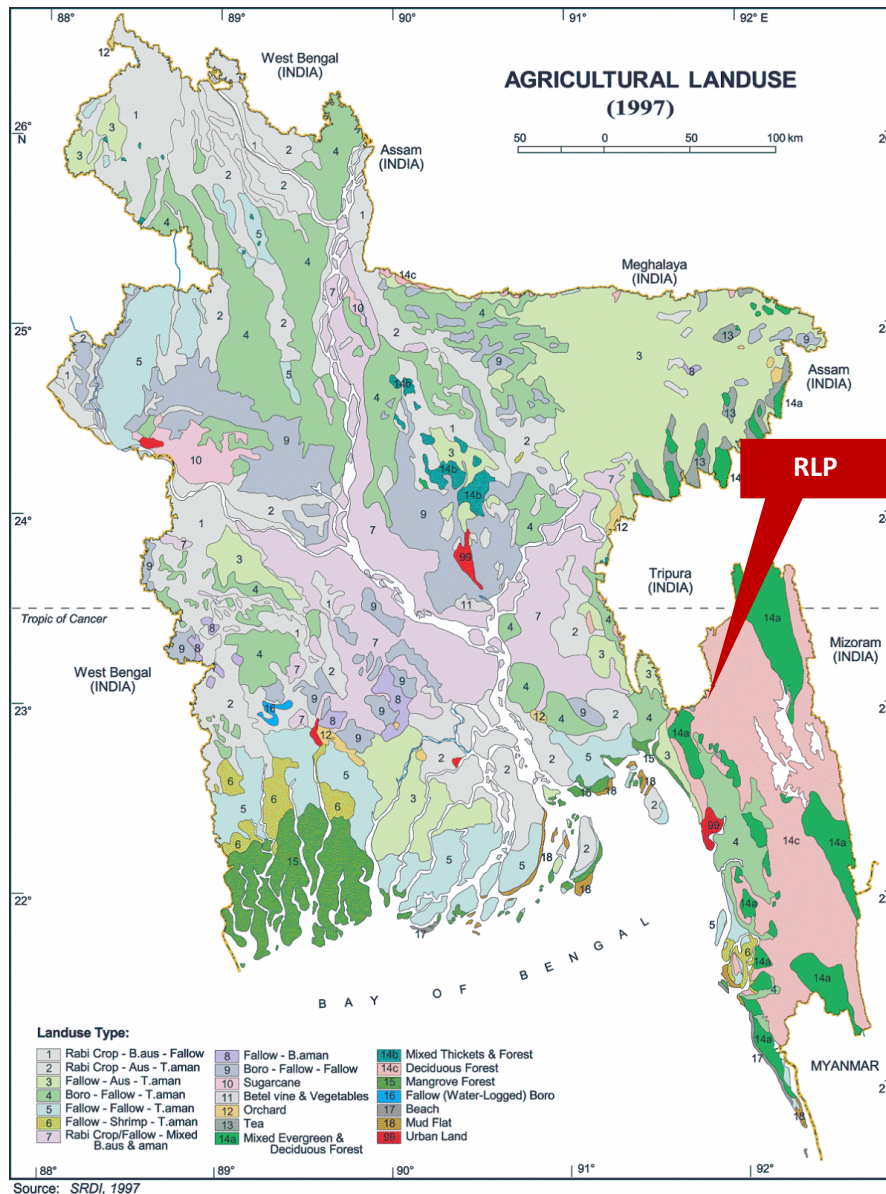


Figure 25: Agricultural land use map of Bangladesh¹

4.9 Agricultural Resources

4.9.1 Farming Practice

193. There are some agricultural lands in the project area. Paddy, sweet potato, ginger, turmeric, sugarcane, bamboo, vegetables are the main crops of Ramgarh Upazila. The major income generating activities of the people in this area is agriculture. But the status of non-farm activities in the district is increasing.

¹ SRDI

4.9.2 Crop Production

194. Crop production especially for Paddy in Ramgarh Upazila is not a full satisfactory Land Port trend. Following table shows the rice production in Ramgarh Upazila.

Table 18: Production of Rice in Ramgarh upazila ¹

Year	Types of rice (Area in acre and production in metric ton)					
	Aus		Aman		Boro	
	Area	Production	Area	Production	Area	Production
2009-2010	546	4630	6848	74500	2544	35220
2010-2011	444	334	6948	7572	2663	3787

4.10 Fisheries

4.10.1 Fish Production

195. Fish culture or catching is not available in the project surrounding area. But in Khagrachhari Hill District fish resources are diversified with different fresh water habitats. The information regarding fisheries in Ramgarh upazila is given in the following table.

Table 19: Fish production status in Ramgarh upazila²

Sources	2010-2011	2009-2010
Number of pond	495	-
Number of Dighee	29	-
Number of fisherman	0	0
Production of fish	0	0

4.10.2 Fish Diversity in the Feni River and Project Influence Area

196. Only in the monsoon different types of fisheries are found in Feni River. Fisheries diversity is high in the estuary of Feni River. Proposed project is adjacent to the upstream part of Feni River. In this area most available fisheries found during field study are - Taki, Rui, Baim, different types of carp, mola, tengra, pabda, koi, shol, boal, meni, shrimps, prawn, crab etc. In the other time of the year the quantity is minimum.

¹ BBS,2011

² BBS, 2011

Table 20: List of Fishes in the Project Influence Area¹

Local/Common name	English Name	Scientific name	Local status	IUCN status in Bangladesh
Taki	Dwarf Snakehead	Channa gachua	Present	LC
Rui	Rohu	Labeo rohita	Present	LC
Bim	Tire-track Spinyeel	Mastacembelus armatus	Rarely present	EN
Mola	Indian Carplet, Carplet	Amblypharyngodon microlepis	Present	LC
Tangra	Kerala Mystus	Mystus armatus	Present	DD
Pabda	Pabda catfish	Ompok pabda	Rarely present	EN
Koi	Gangetic Koi	Anabas cobojus	Present	DD
Shol	Snakehead Murrel,	Channa striatus	Present	LC
Boal	Freshwater shark	Wallago attu	Rarely present	VU
Meni	Mottled Nandus	Nandus nandus	Present	NT

197. **Note:** IUCN Status: EX=Extinct, EW=Extinct in the Wild, RE=Regionally Extinct, CR=Critically Endangered, EN=Endangered, VU=Vulnerable, NT= Near Threatened, LC=Least Concern, DD=Data Deficient.

198. According to above table, available species in the project influence area are least concern according to IUCN list for Bangladesh. Also, project activities will not affect the biodiversity of the river because riverbank protection and vegetation/greenery area will be provided. It is also suggested that if any species with concern will found during construction or operation phase then action will be taken to conserve that species.

4.11 Ecological Resources

4.11.1 Bio-ecological Zone for Project

199. IUCN, The World Conservation Union, has divided Bangladesh into 25 Bio-ecological Zones (Nishat et al, 2002) in the context of physiographic and biological diversity. The study area has fallen under bio-ecological zone of Chattogram hills and the CHTs. The area (both directly and indirectly impacted area) occupies terrestrial as well as aquatic ecosystems. A map of the Bio-ecological zone is presented in the figure below.

¹ Field Survey

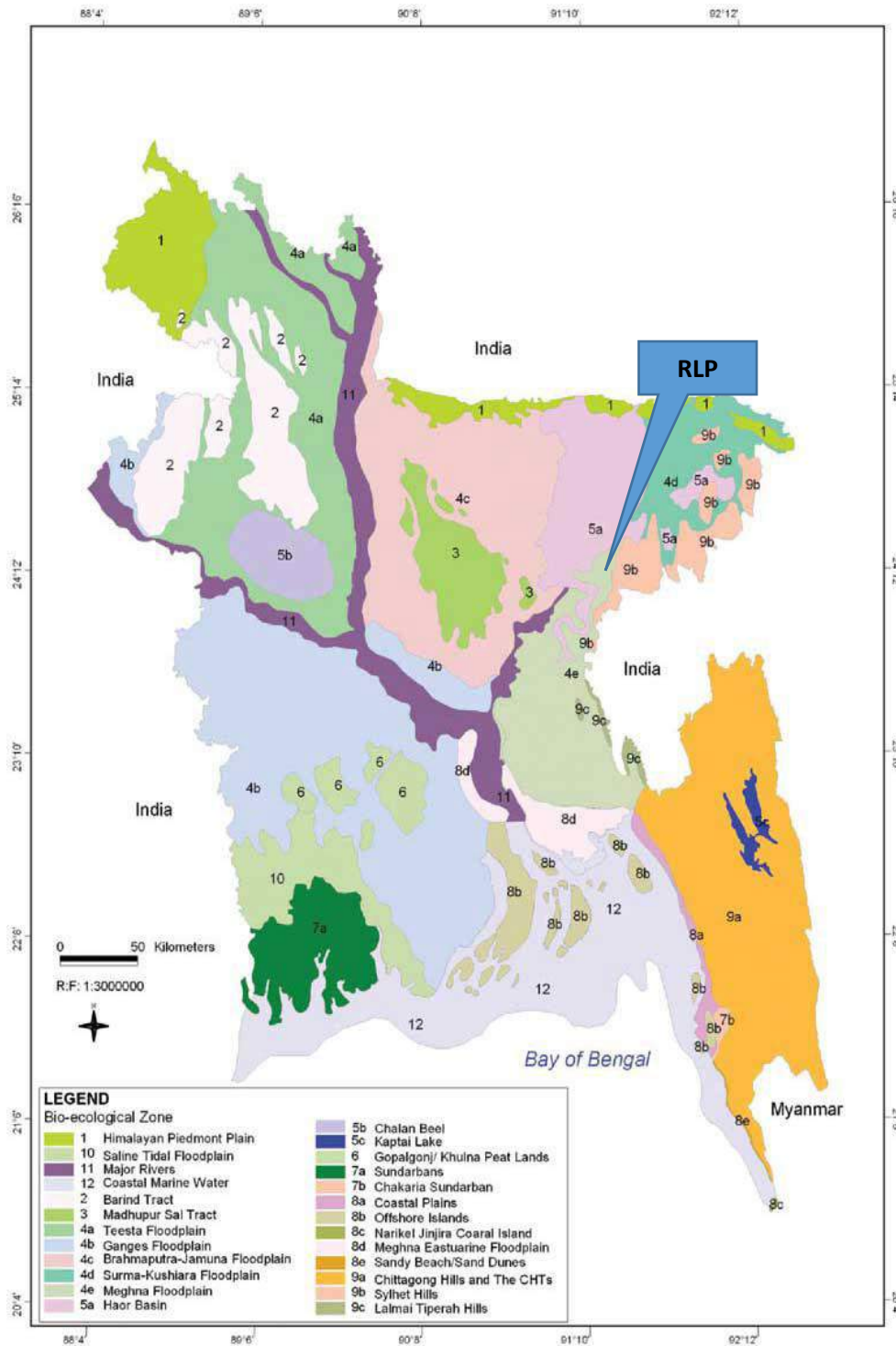


Figure 26: Bio-ecological zones of Bangladesh¹

4.11.2 Flora and Fauna in the Project Influence Area

200. Ecosystems are functional units of interacting abiotic, biotic, and cultural (anthropogenic) components. All-natural ecosystems are open systems where energy and matter are transferred in and out through the complex interactions of energy, water, carbon, oxygen, nitrogen, phosphorus, sulfur and other cycles. The

¹ www.thebangladesh.net

project site is located in semi-urban area. Adequate mitigation program should be undertaken to protect the existing ecosystem from gaseous emissions and water discharge from the proposed project.

201. **Flora:** In the port area different species of herbs, shrubs, grasses and trees are found during field survey which is important for both economical as well as for environmental sustainability of the area. Mango, Jack fruit, Wood apple Coconut, Betel nut, Palm, Lichi, Velvet apple (Bono gub), Plum, Jujube (Boroi), papaya, Banana, Guava, Lemon etc. are generally found around the project area. Among the wood trees Teak (Shegun), burflower-tree (Kodom), Mahagoni, Neem, Lebbeck (Koroi), Indian fig tree (Dumur) and different types of bamboo are available in the surrounding study area.
202. **Fauna:** The terrestrial fauna including mammals, birds, reptiles and amphibians are available in the surrounding study area. During field survey different types of fauna are found around the project area such As-Dog, Cow, Goat, Wild Boar, House mouse, Field mouse, Common House Rat, Field rat, different types of Frog and Snakes. Large Indian civet, Bengal fox, Yellow/golden monitor, Mongoose, Tortoise etc. sometimes come from nearby area. Different types of Earthworms are very common in this area. Among the birds House crow, Magpie-robin (Doel), Common Myna (Bhat Shalik), House sparrow (Chorui), Red-vented Bulbul, Eastern Spotted Dove etc. are found around the project area. Besides, different types of butterflies are also found in this area.

Table 21: List of Fauna in the Project Influence Area¹

Local/Common name	English Name	Scientific name	Local status	IUCN status in Bangladesh
Shukar, Buno shukar, Shuar	Wild Boar, Eurasian Wild Boar	Sus scrofa	Present	LC
Nengti Idur	House Mouse	Mus musculus	Present	LC
Metho Nengti Idur, Metho Idur, Khudi Idur, Idur	Common Indian Field Mouse, Little Indian Field Mouse	Mus booduga	Present	LC
Indur	Common House Rat	Rattus rattus	Present	LC
Metho Indur	Soft-furred Rat, Mated Field Rat, Soft-furred Field Rat	Millardia meltada	Present	LC
Baghdas, Bham or Bham Biral, Gandho Gokul or Khatas	Large Indian civet	Viverra zibetha	Rarely present	NT
Khek Shial	Bengal fox	Vulpes bengalensis	Rarely present	VU

¹ Field Survey

Local/Common name	English Name	Scientific name	Local status	IUCN status in Bangladesh
Sona Gui, Haldey Gui	Yellow/golden monitor	Varanus flavescens	Rarely present	
Boro Beji, Neul, Neule, Nokul	Indian Grey Mongoose, Common Mongoose	Herpestes edwardsii	Rarely present	LC
Pati Kak	House Crow	Corvus splendens	Present	LC
Doel	Magpie-robin	Copsychus saularis	Present	LC
Bhat Shalik	Common Myna	Acridotheres tristis	Present	LC
Chorui/Pati Chorui	House sparrow	Passer domesticus	Present	LC
Bangla Bulbul	Red-vented Bulbul	Pycnonotus cafer	Present	LC
Tila Ghughu	Eastern Spotted Dove	Spilopelia chinensis	Present	LC

203. **Note:** IUCN Status: EX=Extinct, EW=Extinct in the Wild, RE=Regionally Extinct, CR=Critically Endangered, EN=Endangered, VU=Vulnerable, NT= Near Threatened, LC=Least Concern, DD=Data Deficient.

204. According to above table, available species in the project influence area are least concern according to IUCN list for Bangladesh. Also, project activities will not affect the biodiversity of that area because proper mitigation measures will be taken. It is also suggested that if any species with concern will found during construction or operation phase then action will be taken to conserve that species.

4.12 Demographic and Socio-Economic Information of the Project Area

4.12.1 Area and Population

205. For conducting Social Impact Assessment and collecting primary socio-economic information of the project area, two Focus Group Discussion (FGD) meetings were arranged with the beneficiaries and project affected persons. In collecting information, both quantitative and qualitative techniques were applied. The SIA data comprised census of Project Affected Persons and an inventory of losses of land, structure, crops and trees, etc. It also comprised a baseline survey of 190 sample households in Ramgarh and Matiranga Upazila of Khagrachari Hill District.

206. Population density of Ramgarh Upazila and of Khagrachari Hill District was 249 and 223 respectively and household size for the Upazila, district varied from 4.80 to 4.59. Sex Ratio of male/female was very close to 1.05 in both Ramgarh Upazila and

Khagrachari Hill District.¹

Table 22: Area and Population of the Study Area²

Reference Area	Area acre	Area sq km	HH	Pop (000)	Density (per sq. km.)	AV HH Size	Female Pop (000)	Male Pop (000)	Sex Ratio
Ramgarh Upazila	71,140	1758	14,906	72	249	4.8	36.6	35	1.05
Khagrachari District	679,333	2749	133,792	614	223	4.6	314	300	1.05
Bandarban District	1106788	4479	80102	388	87	4.8	203	185	1.10
Rangamati District	1511322	6116	128496	596	97	4.6	313	283	1.11
3 CHT Districts	32,97,443	13344	342390	1598	120	4.7	830	768	1.08
Bangladesh (area, pop)		148,000	32.1 million	150 million	1,014	4.4	74.98 million	74.79 million	1.003

* National statistics are provided in the bottom row for comparison.

207. Compared to the above, of the 190 respondents 108 are men and 82 are women. The 190 sample households have 598 household members with average household size of 3.15 meaning that the sample respondents in Ramgarh had smaller household than national average 4.4 and that of 57 respondent PAP households 6.0. Of the population of 190 sample households 56.8% are adult male, 43.2% are adult female.³ The respondent PAP HHs tended to include members of extended family as HH member as included many co-sharers while the respondent HHs not affected by LA showed only resident nuclear HH members in their response.

4.12.2 Religion and Ethnicity

Table 23: Number of Respondents by Ethnicity and Sex⁴

	All Respondents			% of Respondents		
	Male	Female	Total	Male	Female	Total
Ethnic	34	25	59	57.63	42.37	100
Bangalee	74	57	131	56.49	43.51	100
Total	108	82	190	56.84	43.16	100

208. Of the 190 respondents interviewed under SIA 108 are men and 82 are women. The female respondents are 42.37% in the Ethnic communities which is 43.51% in the Bangalee communities. In addition to these 190 HHs a census of 61 HHs affected by

¹ BBS, 2011

² BBS, 2011

³ SIA Field Survey, 2020

⁴ SIA Field Survey, 2020

LA was conducted under LA 13 of them are ethnic households (21.3%).

Table 24: Composition of the Reference Area Population by Religion¹

Reference Area	Muslim	Hindu	Christian	Buddhist	Others	Total
Ramgarh Upazila	57.64	15.79	0.228	25.99	0.348	71677
Khagrachari District	44.67	16.81	0.66	37.68	0.176	613917
Bandarban District	50.75	3.38	10.13	31.68	4.05	388335
Rangamati District	35.15	5.07	1.45	58.23	0.095	595979
CHT % by Religion	42.60	9.17	3.26	43.89	1.09	100
Bangladesh % by Religion	90.3	8.6	0.6	0.3	0.1	150 million

209. The study area Upazila and three districts comprise mainly of two religious' groups- the Muslims and Buddhists with the minority of Hindu and Christian. Bangladesh on the whole has 90% Muslim population which is 42.6% in Chattogram Hill Tracks, 44.67% in Khagrachari Hill District but 57.64% in Ramgarh Upazila. This means that Ramgarh Upazila has higher percentage of Muslim population than in the three hill tracks districts. Of the 190 SIA respondents 64% are Muslim, 24.2% are Buddhists, 10.5% are Hindu and 0.5% are Christians. Of the 61 HHs having land to be acquired 80% are Muslim, all others are non-Muslim.²

4.12.3 Marital Status of Sample Respondents

210. Marital status of sample respondents in the project area is provided in table below-

Table 25: Marital status of the Respondents³

Marital status	All Respondents		Ethnic		Bangalee	
Unmarried	18	9.47%	6	10.17%	12	9.16%
Married	148	77.89%	44	74.57%	104	79.39%
Divorced	0	0%	0	0%	0	0%
Widowed	22	11.57%	9	15.25%	13	9.92%
Sep/Other	2	1.05%	0	10.17%	2	1.52%
Total	190		59		131	

211. Table 25 shows that of all respondents 77.89% are married, 11.57% are widowed and 9.47% are unmarried. Percentage of married population is a bit higher among the Bangalee respondents than among the ethnic community respondents. Of the 57 respondents interviewed while preparing RAP 66.7% of the females are married, 23.8% are widows and 9.5% are unmarried. Among the male respondents in RAP 77.8% are married, 11.1% are unmarried and only 5.6% are widowed. Widows are

¹ BBS, 2011

² SIA Field Survey, 2020

³ SIA Field Survey, 2020

fewer among males as they remarry after the death of wife.

4.12.4 Household Members

212. Table below shows number of household members in the project area.

Table 26: Number of Household Members ¹

Household Members	All Respondents	Ethnic	Bangalee
Total Adult Male	181	55	126
Total Adult Female	190	59	131
Total Boy	119	32	87
Total Girl	108	29	79
Total HH Members	598	175	423
Av HH Size	3.15	2.97	3.23

213. In the study area, there are total 598 members in the sample 190 households' number of adult males is 181 and adult females is 190. In contrast, the number of boys is higher than that of girls. Average size of households of Bangalee HH is comparatively higher than that of ethnic people households.

Table 27: Number of Earning Members in the Households²

Marital status	All Respondents	Ethnic	Bangalee
Total Respondents	190	59	131
Total Male earner	177	55	122
Total Fem earner	50	25	25
Total earning members	227	80	147
Earner per HH	1.2	1.4	1.1

214. Table 27 above shows that number of male earners is much higher than female earners among all respondents. While there are 122 male earners in Bangalee households, the number of male earners in ethnic households are only 55 on the other hand the number of female earners in both ethnic and Bangalee households are same (25). On the whole 190 households have 227 earning members or 1.2 earning members per household. In ethnic community it is 80 earners in 59 households or 1.4 earners per household.

¹ SIA Field Survey, 2020

² SIA Field Survey, 2020

4.12.5 Ethnic Identity, Disability and Vulnerability of Respondents

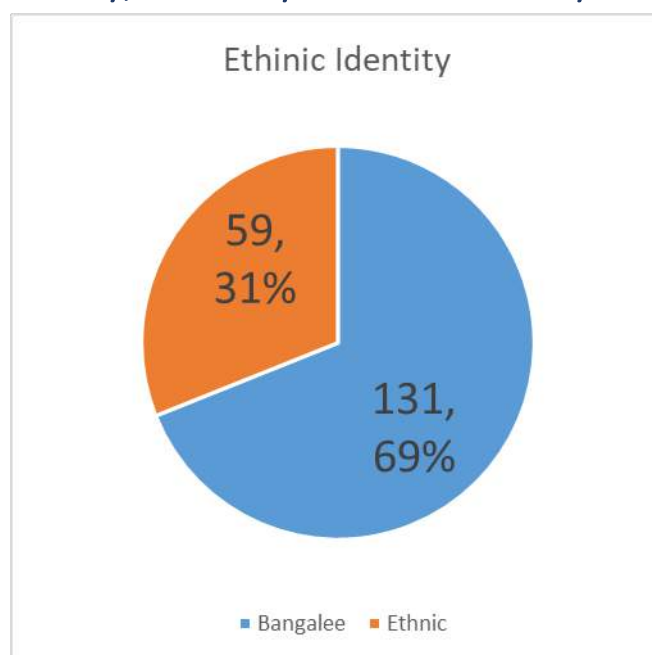


Figure 27: SIA respondents living in the Project Area¹

215. According to this pie chart above in Figure 27, the ratio of Ethnic and Bangalee respondents among total 190 respondents is 31:69.

Table 28: Disability and Vulnerability²

Area	All Disabled	Ethnic	Bangalee	Vulnerable All		Vulnerable Ethnic		Vulnerable Bangalee	
	Freq HH	Freq HH	Freq HH	Male HH	Fem HH	Male HH	Fem HH	Male HH	Fem HH
Ramgarh Residential	1	0	1	2	6	0	0	2	6
Mahamuni Para	0	0	0	0	5	0	4	0	1
Darogapara	0	0	0	0	0	0	0	0	0
Kompara	1	0	1	0	0	0	0	0	0
Masterpara	1	0	1	4	3	3	1	1	2
Ramgarh UP	0	0	0	1	3	0	1	1	2
Matiranga	0	0	0	0	0	0	0	0	0
All Area	3	0	3	7	17	3	6	4	11

216. In the community of 190 respondents only 3 persons are disabled who are all

¹ SIA Field Survey, 2020

² SIA Field Survey, 2020

Bangalee by ethnicity, total 24 households are vulnerable for having monthly income not exceeding Tk. 10,000 of which 17 are female headed and 7 are male headed. This means that majority of the vulnerable households are female headed. Ethnic community has less than proportionate number of vulnerable households. As per RAP, 12 households are vulnerable with income not exceeding Tk. 10,000 per month which 2 are from ethnic community (16%) compared to 10 (18%).

4.12.6 Level of Education

Table 29: Level of Education of All Respondents

Level of Education	All Respondents		Ethnic		Bangalee	
Below Primary	49	25.8%	23	29%	26	19.8%
Primary to Secondary	102	53.7%	23	39%	79	60.3%
SSC to below HSC	19	10%	4	6.8%	15	11.5%
HSC	13	6.8%	7	11.9%	6	4.6%
BA	7	3.7%	2	3.4%	5	3.8%
Total	190	100%	59	100%	131	100%

217. Table 29 shows that of the 190 respondents, more than one half of the respondents (53.7%) had primary to below secondary level of education and 25.8% was illiterate or had low primary level of education. About 10% and 6.8% of the respondents had SSC and HSC level of education and only 3.7% had BA or equivalent level of education.

Table 30: Level of Education of Female Respondents¹

Level of Education	All Respondents		Ethnic		Bangalee	
Below Primary	33	40.2%	15	60%	18	31.6%
Primary to Secondary	40	48.8%	7	28%	33	57.9%
SSC to below HSC	5	6.1%	2	8%	3	5.3%
HSC	3	3.7%	1	4.0%	2	3.5%
BA	1	1.2%	0	0.0%	1	1.8%
Total	82	100%	25	100%	57	100%

218. Table 30 shows that of the 82 female respondents, about one half of the respondents (48.8%) had primary to below secondary level of education and 40.2% was illiterate or had low primary level of education. About 6.1% and 3.7% of the female respondents had SSC and HSC level of education and only 1.2% had BA or equivalent level of education. A comparison of Table 29 and Table 30 reveals that female literacy was lower and particularly the lagged behind men in education.

¹ SIA Field Survey, 2020

Table 31: Educational Qualification of PAP Respondents by Ethnicity¹

Education Level	Bangalee F	%	Ethnic F	%	All F	%
Illiterate	5	10	0	0.0	5	8.8
Grade I-IV	11	22	1	14.3	12	21.1
PCE pass	8	16	1	14.3	9	15.8
Grade VI-VII	11	22	0	0.0	11	19.3
JSC	2	4	2	28.6	4	7.0
Grade IX-X	2	4	1	14.3	3	5.3
SSC	3	6	0	0.0	3	5.3
Grade XI-XII	1	2	1	14.3	2	3.5
HSC	3	6	1	14.3	4	7.0
BA	1	2	0	0.0	1	1.8
MA	2	4	0	0.0	2	3.5
Others	1	2	0	0.0	1	1.8
All	50	100	7	100.0	57	100.0

4.12.7 Type of Land Owned

Table 32: Type of Land Owned

Type	% All Respondents	% Ethnic	% Bangalee	Average area Ethn (area dec)	Average area Ban (area dec)
Homestead land	100.0	100.0	100.0	9	8
Cultivable land	11.6	15.3	9.9	80	92
Business land	0.0	0.0	0.0	0	0
Others	0.5	0.0	0.8	0	100

219. Table 32 shows that of the 190 sample households, all own homestead land and 11.6% own cultivable land also. Higher percentage of ethnic community respondents own cultivable land than the Bangalees. Average area of homestead land owned was 9 decimals per ethnic community respondent and 8 decimals per Bangalee respondent. On the other hand, the ethnic and Bangalee respondents owned 80 and 92 decimals cultivable land meaning that although the ethnic community had larger homestead land but had smaller piece of cultivable land on average.

220. As per RAP, all of the 5 house owners are non-owners and are claiming occupancy by mortgage, haat dolil (Signed on a plain paper) or dokholdar (non-owner occupant). Among users of agricultural land 11 are owner with mutation, 6 are descendants or widow of the mutation holder owner, 11 claim to hold haat dolil

¹ RAP Field Survey, 2019

(Signed on a plain paper), 14 are co-sharers and 4 are absentee owners. Of the absentee owners 3 are from ethnic community and of the 5 structure owners 2 are from ethnic community. None of the holders of haat dolil, lease, mortgage, borga are from ethnic community but 4 of the 6 descendants or widow of the mutation holder owners are from ethnic community.

4.12.8 Water and Sanitation Facility

Table 33: Source of Drinking Water^{r1}

Source of drinking water	All Respondents		Ethnic		Bangalee	
	Freq	%	Freq	%	Freq	%
Has no water source at homestead	43	22.6	19	32.2	24	18.3
Has water source at homestead	147	77.4	40	67.8	107	81.7
Hand Pump Tube Well	111	75.5	30	75.0	81	75.7
Tube Well with motor & pump	36	24.5	10	25.0	26	24.3
All Sources	147	100	40	100	107	100

221. Table 33 shows that of the 190 sample households 147 (77.4%) has water source within homestead and the remaining 43 (22.6%) has to collect drinking water from outside meaning tube well of neighbors. Nobody used drinking water of pond, rain water harvest, piped water supply, jhorna (fountain) and river/ lake.

222. The RAP Census of PAPs shows that, all affected households get the facility of drinking water from tube-well. Only five PAPs need to relocate house as their present house will be affected by LA. All of them drink water from two tube wells of neighbors.

Table 34: Availability of Sanitation Facility

Type of Toilet Facility	All Respondents		Ethnic		Bangalee	
	Freq	%	Freq	%	Freq	%
Sanitary water sealed	85	45.9	27	48.2	58	45.0
Sanitary non-water sealed	69	37.3	19	33.9	50	38.8
Pit/ Ring Slab Non-Saniary	31	16.8	10	17.9	21	16.3
Open/ No Toilet	0	0.0	0	0.0	0	0.0
All Types	185	100	56	100	129	100

223. Of the 190 respondents, information was available from 185 and Table 34 showing their distribution reveals that 45.9% use water sealed sanitary toilets, 37.3% use non-water sealed sanitary toilets and the remaining 16.8% use ring slab or non-sanitary pit toilets. The distribution pattern is nearly similar but the ethnic

¹ SIA Field Survey, 2020

community has a bit better, larger percentage having water sealed sanitary toilets than that of bangalee respondents. This can be seen in Table 34 and Figure 28.

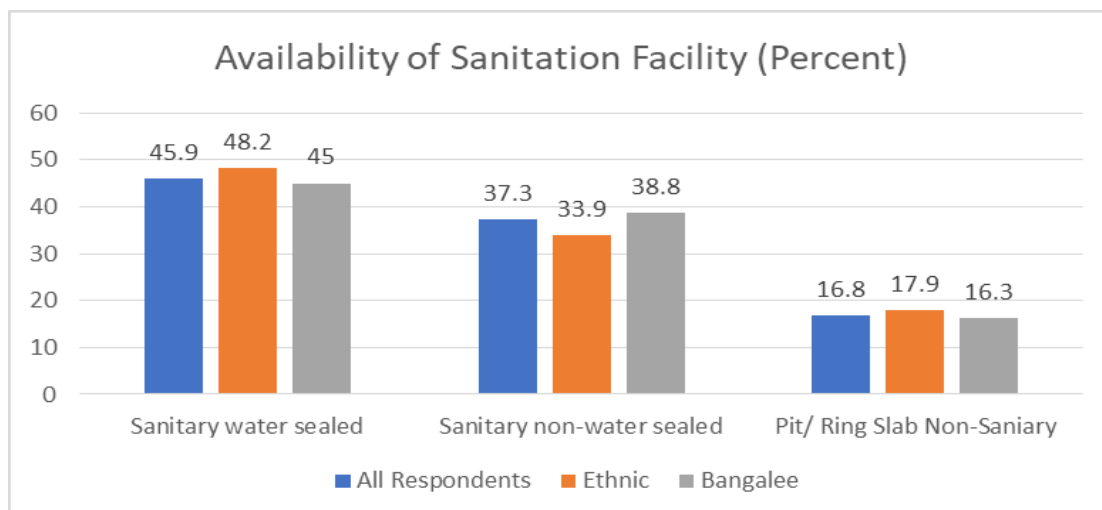


Figure 28: Availability of Sanitation Facility

224. Of the 05 PAPs affected by LA, 04 have non-water-sealed Ring-Slab toilets and the last 01 share toilet with a kin-family living in the same compound.

4.12.9 Electricity, Service and Use of Mobile Phone and Internet

Table 35: Electricity Connection for Lighting

Answer/ Source	All Respondents		Ethnic		Bangalee	
	Freq	%	Freq	%	Freq	%
Has Electricity	169	88.95	49	83.05	120	91.60
Has no Electricity	21	11.05	10	16.95	11	8.40
Solar	8	4.21	8	13.56	0	0.00
National Grid	161	84.74	41	69.49	120	91.60
All Types	190	100	59	100	131	100

225. Table 35 and Figure 29 show that overall 88.95% households have electricity facility of which 84.74% has connection from national power grid and 4.21% use solar power. The remaining 11.05% have no electricity facility. The ethnic community has lower access to national power grid and electricity as a whole. But this is partly compensated by larger share of solar electricity as relatively inaccessible areas where the ethnic people cannot be reached by national grid.

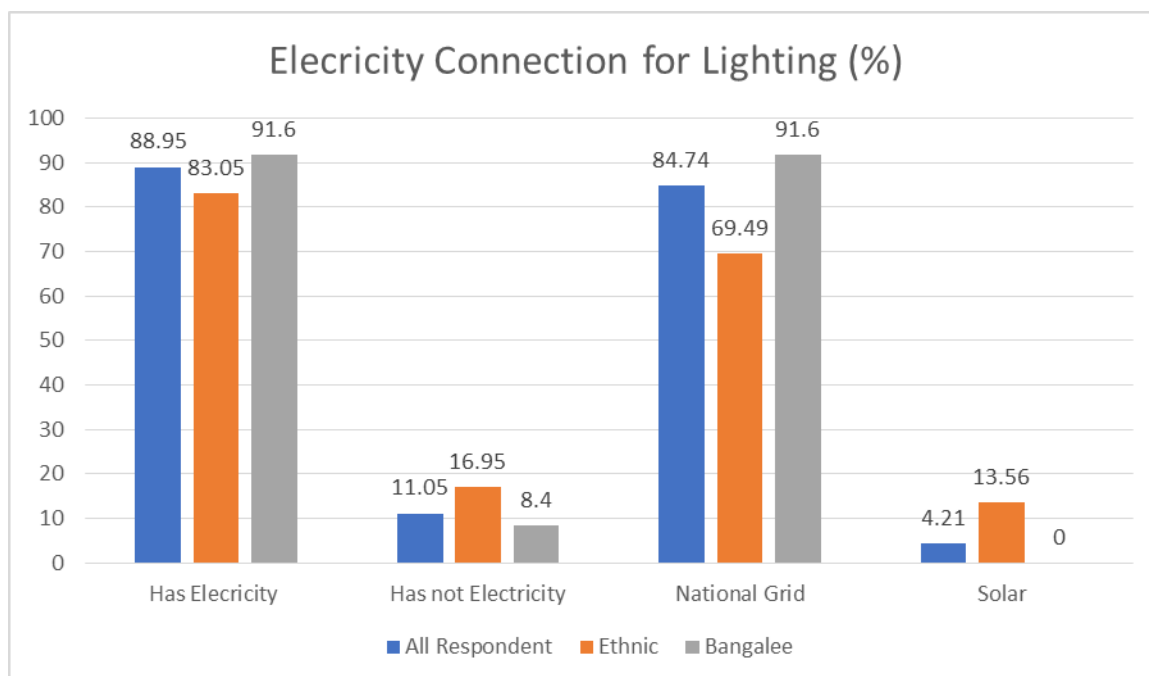


Figure 29: Electricity Connection for Lighting

226. All of the five PAPs living on land to be acquired have electricity connection from national grid.

Table 36: Use of Mobile Phone and Internet in the Respondent Households

Type of user	AI respondents		Ethnic		Bangalee	
	Freq HH	%	Freq HH	%	Freq HH	%
Cell Phone user- Number of active Sims	188	98.95	58	30.53	130	68.42
Internet Broadband user	9	4.74	2	1.05	7	3.68
Internet by Smart Phone	81	42.63	33	17.37	48	25.26
Social media	60	31.58	27	14.21	33	17.37

227. Of the 190 sample respondents, information was available from 188. This is shown in Table 36 which reveals that 98.95% respondents have at least one cell phone or active SIM in the household, 31.58% use social media not use email for correspondence. The social media correspondence is maintained by broadband connect (4.74%) and 42.62% by smart phone. None used internet for official correspondence, education and business purpose but use mobile phone for business as needed. As revealed from the 57 PAP respondents, all have cell phone.

4.12.10 Sickness, Diseases and Mortality

Table 37: Illness of Household Members over the past 12 months

Whether anybody was Sick	All Respondents		Ethnic		Bangalee	
	Freq	%	Freq	%	Freq	%
Yes	38	20.0	8	13.6	30	22.9
No	152	80.0	51	86.4	101	77.1
All	190	100	59	100	131	100

228. Table 37 and Figure 30 show that 80% of the respondent households did not report any sickness within household over the past twelve months and 20% reported sickness. The ethnic community respondents had lower sickness reported (13.6%) than Bangalee respondents (22.9%).

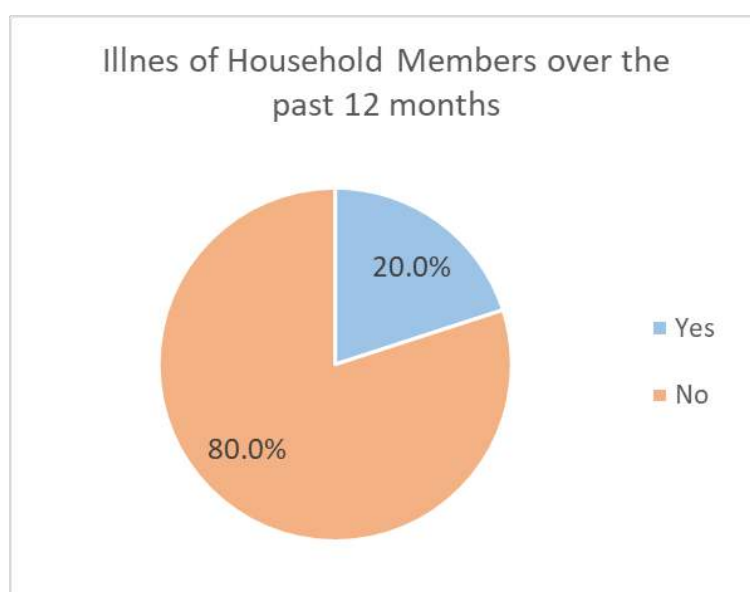


Figure 30: Illness of Household Members over the past 12 months

229. This pie chart shows that among 190 households, members of one-fifth households were ill/sick over past 12 months.

Table 38: Type of Disease

Type of diseases	All Respondents		Ethnic		Bangalee	
	Freq	%	Freq	%	Freq	%
Fever/Cough/Influenza	6	15.8	3	37.5	3	10.0
Diarrhea	1	2.6	0	0.0	1	3.3
Asthma, Respiratory	7	18.4	1	12.5	6	20.0
Gastric Ulcer	3	7.9	0	0.0	3	10.0

Type of diseases	All Respondents		Ethnic		Bangalee	
	Freq	%	Freq	%	Freq	%
Rheumatic Fever	1	2.6	0	0.0	1	3.3
Kidney disease	2	5.3	1	12.5	1	3.3
Mental illness	2	5.3	0	0.0	2	6.7
Eye diseases	1	2.6	0	0.0	1	3.3
Body pain	14	36.8	3	37.5	11	36.7
The hand is burnt	1	2.6	0	0.0	1	3.3

230. Of the 38 respondents reporting sickness, top 10 frequently reported diseases are shown in Table 38. It reveals that highest 36.8% had complained of body pain followed by asthma and respiratory diseases (18.4%), Fever/Cough/Influenza (15.8%) and gastric ulcer (7.9%).

Table 39: Age of Diseased Person

Age	All Respondents		Ethnic		Bangalee	
	Freq HH	% affected	Freq HH	% affected	Freq HH	% affected
0-4	6	15.8	1	12.5	5	16.7
5 to 14	1	2.6	0	0.0	1	3.3
15-19	2	5.3	0	0.0	2	6.7
20-49	12	31.6	4	50.0	8	26.7
50-64	12	31.6	3	37.5	9	30.0
65+	5	13.2	0	0.0	5	16.7
All Ages	38	100.0	8	100.0	30	100.0

231. Table 39 shows that 31.6% of the sick persons were of 50-64 years age and another 13.2% were of age 65+. It is surprising that quite high percentage (31.6%) of the reported sick persons were of age 20 to 49. It is also worth noting that 15.8% of the sick persons were below 5 years old indicating high morbidity of children.

Table 40: Duration of Illness

Duration	All Respondents		Ethnic		Bangalee	
	Freq HH	% Number	Freq HH	% Number	Freq HH	% Number
One week to 1 month	12	31.6	5	62.5	7	23.3
Above one month	26	68.4	3	37.5	23	76.7
All duration	38	100.0	8	100.0	30	100.0

232. Table 40 shows that more than two-thirds (68.4%) of the sick persons had been suffering for more than one month and another about one-third (31.6%) were suffering for one week to one month. Those suffering for less than one week were

not reported by the respondents.

Table 41: Type of health facility accessed during sickness

Type	All Respondents		Ethnic		Bangalee	
	Freq HH	%	Freq HH	%	Freq HH	%
Community Clinic	0	0.0	0	0.0	0	0.0
Union HFWC	0	0.0	0	0.0	0	0.0
UHC	6	15.8	2	25.0	4	13.3
Private Hospital/ Clinic	11	28.9	1	12.5	10	33.3
Medicine shop	3	7.9	0	0.0	3	10.0
District Hospital/ MCH	16	42.1	4	50.0	12	40.0
Village Doctor	1	2.6	0	0.0	1	3.3
Unani/ Ayurvedik	1	2.6	1	12.5	0	0.0
Others	0	0.0	0	0.0	0	0.0
All Facilities	38	100.0	8	100.0	30	100.0

233. Table 41 shows that 42.1% of the respondents reported to have used district hospital/medical college hospital for getting treatment. It was followed by private hospital/clinic (28.9%) and Upazila Health Complex (15.8%). It should be noted that the reported 38 cases of sickness were one week to one month or above one-month duration therefore the percentage of medicine, village doctor, unani/ayurvedic, etc. was so low. For the same reason, community clinic and union health and family welfare center were not reported.

Table 42: Mortality in the HH, if any, over the past 12 months

Relation Code	All Respondents	Ethnic	Bangalee	
	Freq HH	Freq HH	Freq HH	
Daughter-in-law		2	1	1
Mother		1	0	1
Father		3	0	3
Father-in-law		2	0	2
Mother-in-law		1	1	0
Grandson		1	1	0
Total		10	3	7

234. Of the 190 respondents, 10 reported to have lost some member of the family over the past 12 months. Of them 7 were in the Bangalee community and 3 were in the Ethnic community. Of the dead person to the head of households is shown in Table 42 above.

4.12.11 Effects and benefits of Land Port to Ethnic Households

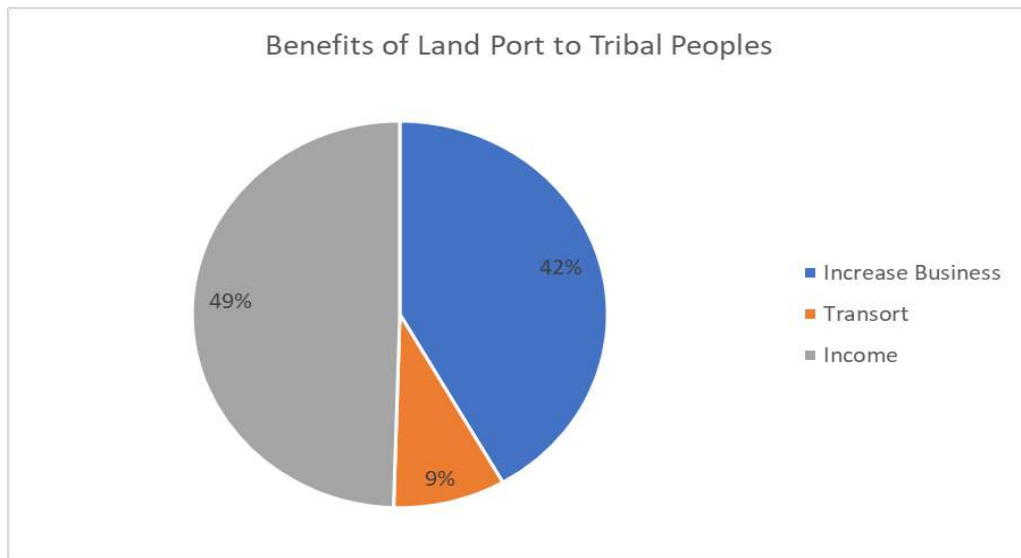


Figure 31: Perceived Benefits of Land Port to Tribal Peoples

235. Figure 31 shows perceived benefits of land port to the tribal people. Almost half of the respondents think that business will be increased for the new land port. In addition, 42% of the respondents believe that income will increase and 9% think that transport system will improve.

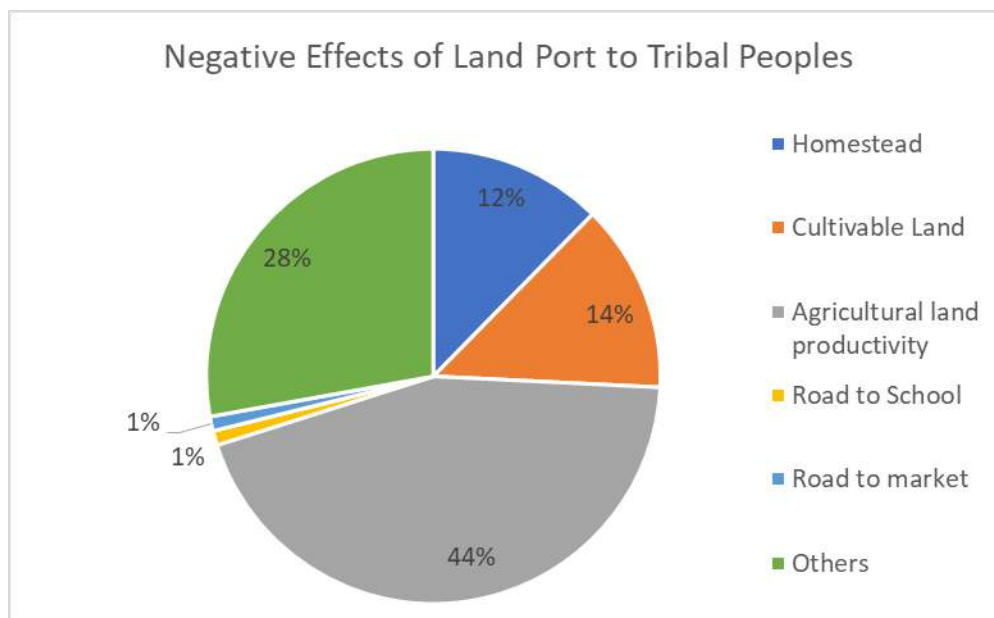


Figure 32: Perceived Negative Effects of Land Port to Tribal Peoples

236. As seen in the Figure 32, 7.44% of the respondents perceive that productivity of agricultural land will be affected and another 12% think that homestead land will be hampered for the land port. In addition, 14% of the respondents think that area of cultivable land will decrease and 20% think of other problems.

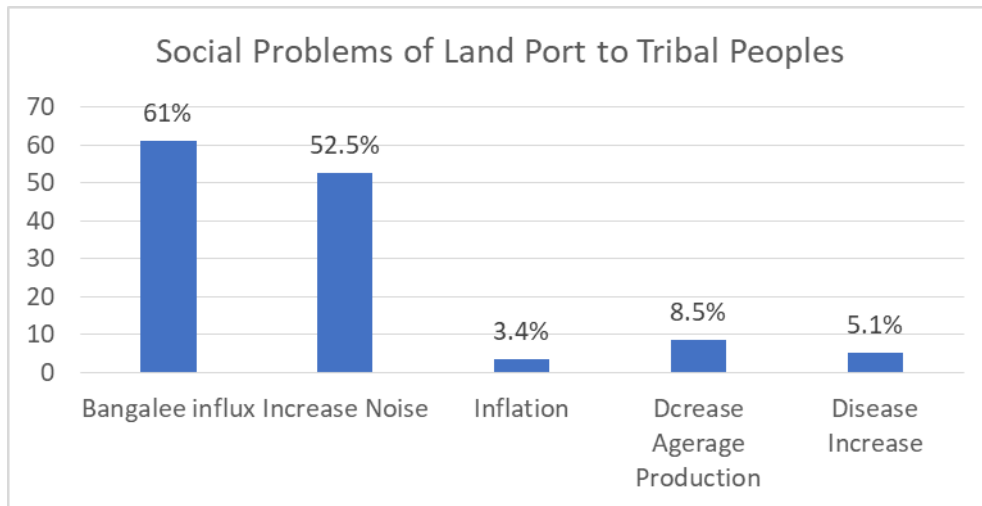


Figure 33: Perceived Social Problems of Land Port to Tribal Peoples

237. Above Figure shows the perceived social problems for the land port to tribal people. About 61% of the interviewed respondents think that Bangalee influx will occur and 52.5% think of noise pollution. Very small percentage of respondents' think of inflation, reduced agricultural production and increase of human diseases.

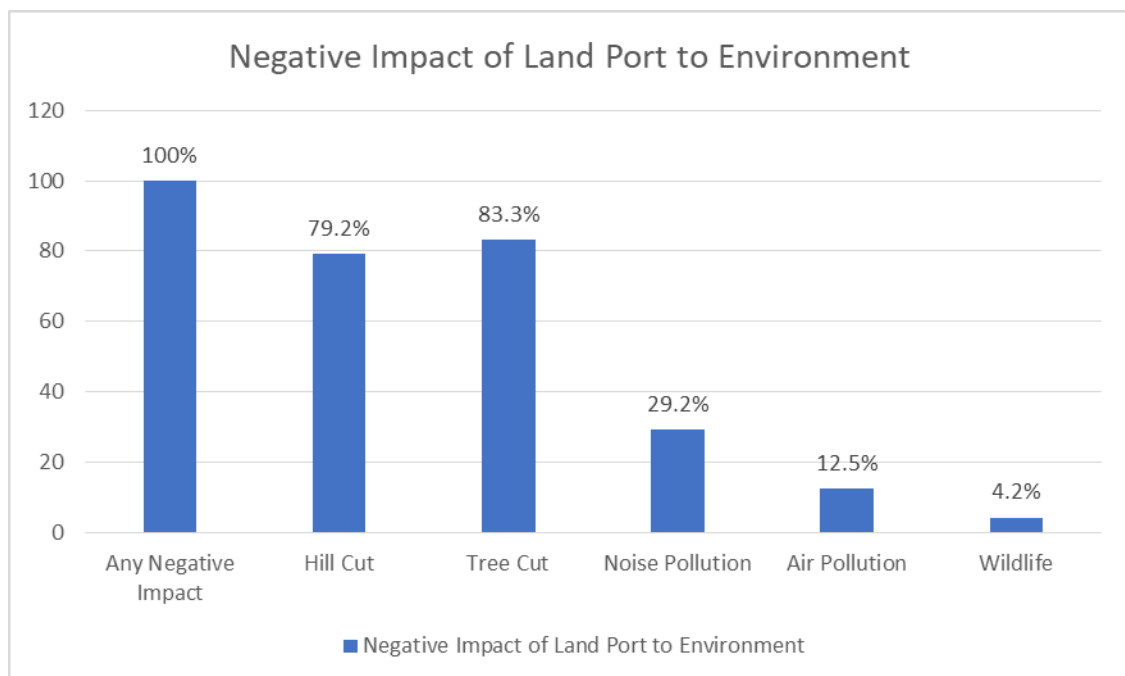


Figure 34: Perceived Negative Impact of Land Port to Environment

238. Figure 34 shows negative impact of land port to the environment of project area where all respondents think that there are some negative impacts. About 79.2% of the respondents think that there will be hill cut due to constructing, 83.3% think of tree felling, 29.2% respondents believe that noise pollution will occur, 12.5% think of air pollution and 4.2% think that wildlife will be reduced.

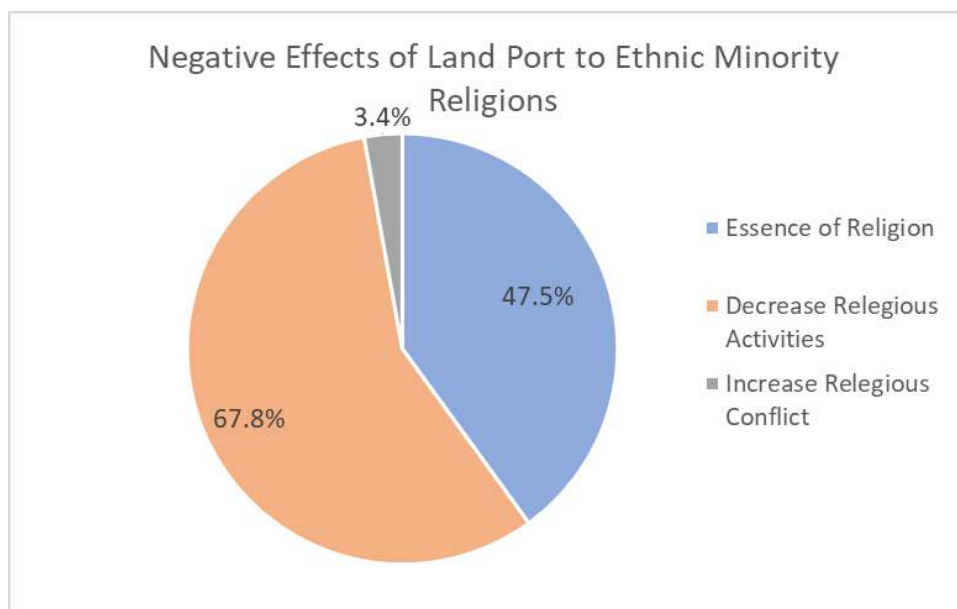


Figure 35: Perceived Negative Effects of Land Port to Ethnic Minority Religions

239. Figure 35 shows negative effects of land port on the ethnic minority religions. Two-third of the respondents thinks that religious activities will be reduced. In addition, 47.5% respondents believe that the essence of religion will be undermined and only 3.4% respondents think that religious conflicts will increase.

4.12.12 Summary of Baseline Situation of Economic Condition

A. Main Occupation of Respondent Households

Table 43: Main Occupation of Respondent Households ¹

Main Occupation	All Respondents		Ethnic		Bangalee	
	Freq	%	Freq	%	Freq	%
Agriculture	18	9.73	4	6.90	14	11.02
Teacher	3	1.62	2	3.45	1	0.79
Service	11	5.95	4	6.90	7	5.51
Household chores	45	24.32	10	17.24	35	27.56
Business	32	17.30	4	6.90	28	22.05
Day Laborer	59	31.89	30	51.72	29	22.83
Driver	7	3.78	1	1.72	6	4.72
Mason- / carpenter / mechanic / technician	8	4.32	3	5.17	5	3.94
Others	2	1.08	0	0.00	2	1.57
Total	185	100.00	58	100	127	100

¹ SIA Field Survey, 2020

240. Table 43 and Figure 36 reveal that 27.56% of Bangalee and 17.24% of ethnic community respondents are engaged in household works meaning that higher percentage of ethnic community respondents including women are engaged in income earning activities. Majority of the ethnic community respondents are however day labor (51.72%) compared to 22.83% Bangalees. But Bangalees are more in agricultural activities than ethnic community respondents.

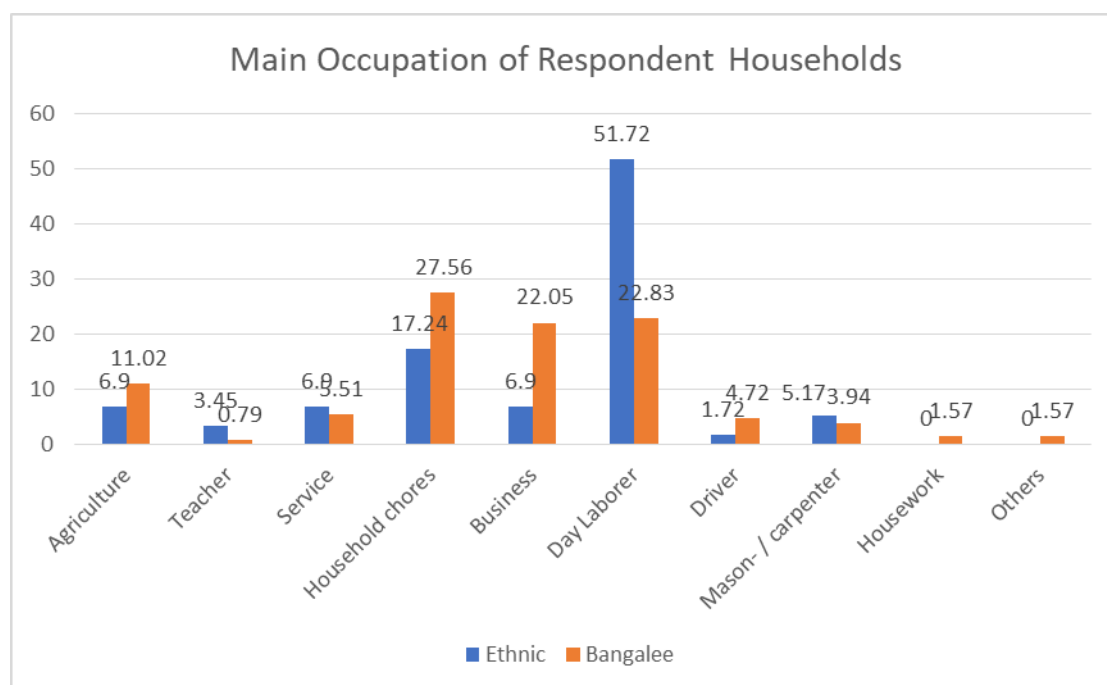


Figure 36: Main Occupation of Respondent Households

Table 44: Occupation/work status of RAP respondents¹

Occupation/work status of respondents	Freq	%	Freq M	% M	Freq F	% F
Agriculture	31	59.6	23	71.9	8	40.0
Service	5	9.6	3	9.4	2	10.0
Household chores	9	17.3	0	0.0	9	45.0
Business	4	7.7	4	12.5	0	0.0
Rickshaw/van driver	1	1.9	1	3.1	0	0.0
Student	2	3.9	1	3.1	1	5.0
Total	52	100.0	32	100.0	20	100.0

241. Table 44 shows frequency distribution of 52 RAP respondents (excluding 5 too old or disabled) of which 32 are male and 20 are female respondents. Of the 32 males 71.9% are farmers, 12.5% are engaged in business and 9.4% in services. Of the 20 females 45% are engaged in household chores, 40% in agriculture, 10% in service and 5% are students.

¹ RAP Field Survey, 2019

B. Income and Expenditure of Respondent Households

Table 45: Income of Respondent Households¹

Income Group	All Respondents			Ethnic			Bangalee		
	Fref HH	Av Income	% HH	Fref HH	Av Income	% HH	Fref HH	Av Income	% HH
Not above 5000	6	3,583	3.2	0	0	0.0	6	3,583	4.6
5001-10,000	24	8,471	12.6	6	8,032	10.2	18	8,662	13.7
10,001-20,000	135	14,689	71.1	40	15,471	67.8	95	14,386	72.5
20,001-30,000	18	26,857	9.5	10	27,375	16.9	8	26,167	6.1
Above 30,000	7	37,571	3.7	3	38,333	5.1	4	37,000	3.1
All Groups	190	15,548	100.0	59	17,894	100.0	131	14,515	100.0

242. Table 45 shows that average income of total 190 respondent households was Tk. 15,548. Of all respondent households, 71.1% belong to income group Tk. 10,001+ to 20,000 and their average income was Tk. 14,689. Average income of all ethnic community respondents (Tk. 17,894) was higher than that of Bangalee respondents (Tk. 14,515). This means that the ethnic community respondents are economically better off than Bangalee respondents.

Table 46: Monthly Income of PAPs (Taka)²

Category	Freq	%	Upto 5000	5001-10,000	10001-20000	20001-30000	30,000 +	Total Inc	Av Inc
Bangalee	50	87.7	0	10	23	12	9	938,000	18,760
Ethnic	7	12.3	0	2	2	3	0	116,040	16,577
All	57	100.0	0	12	25	15	9	1,054,040	18,492

243. Monthly income of 57 PAPs are shown here in Table 46 which shows that 10 of the 50 Bangalee respondents (20%) have monthly income not exceeding Tk. 10,000 which is 2 out of 7 (29%). Average income of Bangalee respondents is Tk. 18,760 which is higher than that of ethnic community respondents (Tk. 16,577) meaning that ethnic community respondents are poorer. This however excludes 4 absentee owners, 3 of them from ethnic community.

¹ BBS, Statistical Year Book (SYB), 2016

² RAP Field Survey, 2019

Table 47: Expenditure of Respondent Households¹

Expenditure Group	All Respondents			Ethnic			Bangalee		
	Fref HH	Av Income	% HH	Fref HH	Av Income	% HH	Fref HH	Av Income	% HH
Not above 5000	4	3,450	2.1	0	0	0.0	4	3,450	3.1
5001-10,000	26	8,832	13.7	10	8,793	16.9	16	8,848	12.2
10,001-20,000	143	14,487	75.3	40	15,400	67.8	103	14,057	78.6
20,001-30,000	12	24,500	6.3	9	25,600	15.3	3	23,714	2.3
Above 30,000	5	35,000	2.6	0	0	0.0	5	35,000	3.8
All Groups	190	14,653	100.0	59	15,836	100.0	131	11,785	100.0

244. Table 47 shows that average expenditure of total 190 respondent households was Tk. 14,653. Of all respondent households, 75.3% belong to expenditure group Tk. 10,001+ to 20,000 and their average expenditure was Tk. 14,487. Average expenditure of all ethnic community respondents was higher than that of Bangalee respondents. Total 59 ethnic households have an average expenditure of 15,836 BDT on the other hand 131 Bangalee households have an average expenditure of 11,785 BDT per month. On the whole, expenditure of 190 respondents was 94.24% of their income which was 88.49% for 59 ethnic community respondents and 81.19% for 131 Bangalee respondents. It means that Bangalee community respondents had lower savings rate than the ethnic community respondents because of low average income.

Table 48: Source of Income and Average Monthly Income by Source

Income Source	All Respondents			Ethnic			Bangalee		
	Freq HH	% HH	Av income	Freq HH	% HH	Av income	Freq HH	% HH	Av income
Business	67	35.3	12,075	13	22.0	12,000	54	41.2	12,093
Salaried Service	35	18.4	12,757	15	25.4	15,200	20	15.3	10,925
Day laborer	89	46.8	8,551	40	67.8	9,550	49	37.4	7,735
Income from crop farming	31	16.3	4,839	12	20.3	5,083	19	14.5	4,684
Cattle farming	6	3.2	4,333	1	1.7	3,000	5	3.8	4,600
Poultry farming	2	1.1	1,250	0	0.0	0	2	1.5	1,250
Income from rent of house	1	0.5	2,500	0	0.0	0	1	0.8	2,500

¹ SIA Field Survey, 2020

Income Source	All Respondents			Ethnic			Bangalee		
	Freq	%	Average Amount	Freq	%	Average Amount	Freq	%	Average Amount
etc.									
Income from horticulture	3	1.6	5,000	0	0.0	0	3	2.3	5,000
(Remittance) sent from abroad	4	2.1	16,375	0	0.0	0	4	3.1	16,375
Others	23	12.1	6,609	2	3.4	6,250	21	16.0	6,643
Total	261		12,789	83		14,279	178		12,118

245. Table 48 shows that 190 respondents had 261 sources of income or average of 1.37 source per household. The ethnic community respondents had 1.4 source per household and Bangalee household had average of 1.36 source per household. Average income of all households seen in this table is Tk. 12,789

Table 49: Source of Loan of Respondent of Sample Households

Source of Loan	All Respondents			Ethnic			Bangalee		
	Freq HH	%	Average Amount	Freq HH	%	Average Amount	Freq HH	%	Average Amount
Commercial Bank	1	0.69	100,000	1	2.44	100,000	0	0	0
Grameen Bank	20	13.79	94,500	3	7.32	45,000	17	16.35	103,235
Government Commercial Bank	21	14.48	205,714	4	9.76	340,000	17	16.35	163,750
National NGO / PKSF	85	58.62	53,671	23	56.10	53,696	62	59.62	53,661
Local NGO	28	19.31	40,567	10	24.39	25,200	18	17.31	48,250
BRDB Samiti	2	1.38	100,000	1	2.44	100,000	1	0.96	100,000
Others	9	6.21	98,889	3	7.32	63,333	6	5.77	116,667
Total	145	100	99,049	41	100	103,890	104	100	97,594

246. Table 49 shows that of 190 respondent households 145 took loan from different government and non-government sources and the average amount of loan was Tk. 99049. About 58.62% respondent households used National NGO or PKSF and 19.31% used Local NGO for load services. In addition, 14.48% households took loan from Government Commercial Bank and only 6.21% used other sources for loan. The average amount of loan taken by Ethnic community households (Tk. 103,890) is slightly higher than Bangalee households (Tk. 97,594).

247. As revealed from the RAP, 21 of the 57 availed loan facility (37%) over past one year. Ten of the borrowers accessed NGOs for loan, 5 from relative/friends, only one from Bank, 3 from other source of small loan.

Table 50: Decision making in Household and managing property

Decision making role in day to day matters	All Respondents		Ethnic		Bangalee	
	Freq	%	Freq	%	Freq	%
Mainly by men	23	12.1	3	5.1	20	15.3
Mainly by women	16	8.4	8	13.6	8	6.1
Jointly	151	79.5	48	81.4	103	78.6
Decision making role in managing property						
Mainly by men	22	11.6	3	5.1	19	14.5
Mainly by women	17	8.9	8	13.6	9	6.9
Jointly	151	79.5	48	81.4	103	78.6

248. Table 50 shows that 79.5% of all respondents agreed that they perform decision making role in day to day matters and managing property jointly by both men and women. It is 81.4% for ethnic people and 78.6% for Bangalee. Percentage of decision in day to day matter is by ethnic women is 13.6% which is only 6.1 in Bangalee community. In property management 13.6% of ethnic women take decision which is 6.9% in Bangalee community. This means that ethnic women are more influential than Bangalee women in decision making role in both day to day matters and property management.

Table 51: Benefits of Land Port

Answer/ Source	All Respondents		Ethnic		Bangalee	
	Freq	%	Freq	%	Freq Yes	Freq No
Land value will increase	122	64.2	37	62.7	85	64.9
Increase house rent	77	40.5	18	30.5	59	45.0
Expand business, employment	175	92.1	56	94.9	119	90.8
Improve transport system	57	30.0	17	28.8	40	30.5
Reduced Travel Time	22	11.6	7	11.9	15	11.5
Total	190	100	59	100	131	100
Sum %		238.4		228.8		242.7

249. Table 51 shows five different benefits of land port in the project area. Multiple response was allowed and on an average each respondent had 2.38 responses. As for individual benefits 92.1% of the respondents think that business will expand and employment opportunity will increase. About 64.2% of respondents believe that land value will increase, 40.5% think that house rent will increase, 30% think that transportation system will improve and 11.6% think that travel time will reduce.

4.12.13 Significant benefits on surrounding economic activities

250. The local economy will be boosted by port-related activities gradually expanding urbanization and industrialization. The port will spur the economic activities like banking, insurance, finance, logistics etc. which will create employment both directly and indirectly. Direct employment generation will be in port related activities. Indirect employment increases will be due to increased trading, transport, industrialization and increase in other services like banking and insurance. So, the future potential of the project is quite prospective.
251. After expansion of the Ramgarh land port cross border trade and movement of passengers will be intensified resulting both social and economic relation between the two bordering countries. The local economy and society in CHT and Chattogram region will benefit not only from increased cross border trade and passenger movement but also from increased trading, transport, industrialization, real-estate development and housing. It will help local labor getting more employment and local producers will get better marketing opportunity of the goods and services produced. Also, Ramgarh Upazila and Khagrachari district will be attracting entrepreneurs from other districts in transport, trade and real-estate business in and around Ramgarh, Fatikchari, Mireswarai and Khagrachari.
252. The bordering regions of the two countries have relatives living on the other side of the border. Improved port facility will increase visits to relatives that will improve social relation not only among the relatives but also among the broader communities in the two countries. This will discourage unlawful border crossing. Increased cross border mobility will enhance tourism, education and health services.
253. Ramgarh is the nearest land port from Tripura to Chattogram port. The new port will open up possibility of Tripura Chattogram bus service in a shorter route.
254. The project's positive impacts include:
- Further improvement of transport and communication infrastructure in the CHT and in the adjoining districts of Feni and Chattogram. This will improve connectivity of CHT to national highway and railway system via Baraiyarhat of Mireswarai Upazila of Chattogram and Feni of greater Noakhali district. The adjoining Fakirhat Upazila of Chattogram will be particularly benefited to access the port and the Khagrachari for business and other purposes.
 - Economic opportunities of the tribal people will improve in trade, transport and operating clearing & forwarding agencies.
 - The Ramgarh town will attract businesses and tourism and will become an important town from a small township.
 - There is possibility of further improving existing road link with Chattogram Port via Manikchari Upazila and Nazirhat. Further, there is possibility of establishing railway link to Ramgarh from Nazirhat of Chattogram in the future.
255. Table below shows the probable positive impact of the proposed land port development.

Table 52: Positive Impact of the Project

SN	Type of Impact	Positive Impact	Comments
1.	Income opportunity for poor	<ul style="list-style-type: none"> Construction period work opportunity Beyond construction Operation & Monitoring (O&M) work Increased business opportunity Poor vulnerable women assisted to establish business 	<ul style="list-style-type: none"> Probable labor influx may grab part of the construction related work opportunity
1.1.	Income opportunity for businessman	Cross border trade will increase. Due to the construction of Dhaka-Chattogram Highway the pace of urbanization and construction industry is flourishing rapidly. So, demand for labor will be high.	Urbanization in and around Chattogram and Ramgarh will increase. Real-estate business will flourish and create new work opportunity
2.	Transport sector	Transport worker, owners will get more income	Increased traffic volume and number of vehicles
2.1.	Trade improvement	Trans border trade will increase	Import from India increased from 1.8 million Metric Ton (MT) in 2014-15 to 2.9 million MT in 2018-19. Ratio of export to import improved from 3.3% to 14.3% over the same period
2.2.	Tourism	As there are many tourist spots in Chattogram division, more tourist will come from India to visit.	Need development and improvement of tourism facilities around Chattogram Division including all the tourist spots.
2.3.	Education	May increase provided quality of education improves in Bangladesh.	Students from Tripura will have an opportunity to avail quality education in Chattogram and Cumilla regions.
2.4.	Healthcare Tourism	May increase provided good quality of health service improves in Chattogram.	Patients from Tripura will have an opportunity to avail quality medical care in Chattogram and Cumilla regions.
2.5.	Investment	Will be increased particularly investment by local entrepreneurs from other districts	Direct foreign investment will be limited initially but will be attracted once infrastructure developed

4.12.14 Traffic Study and Traffic Forecast¹

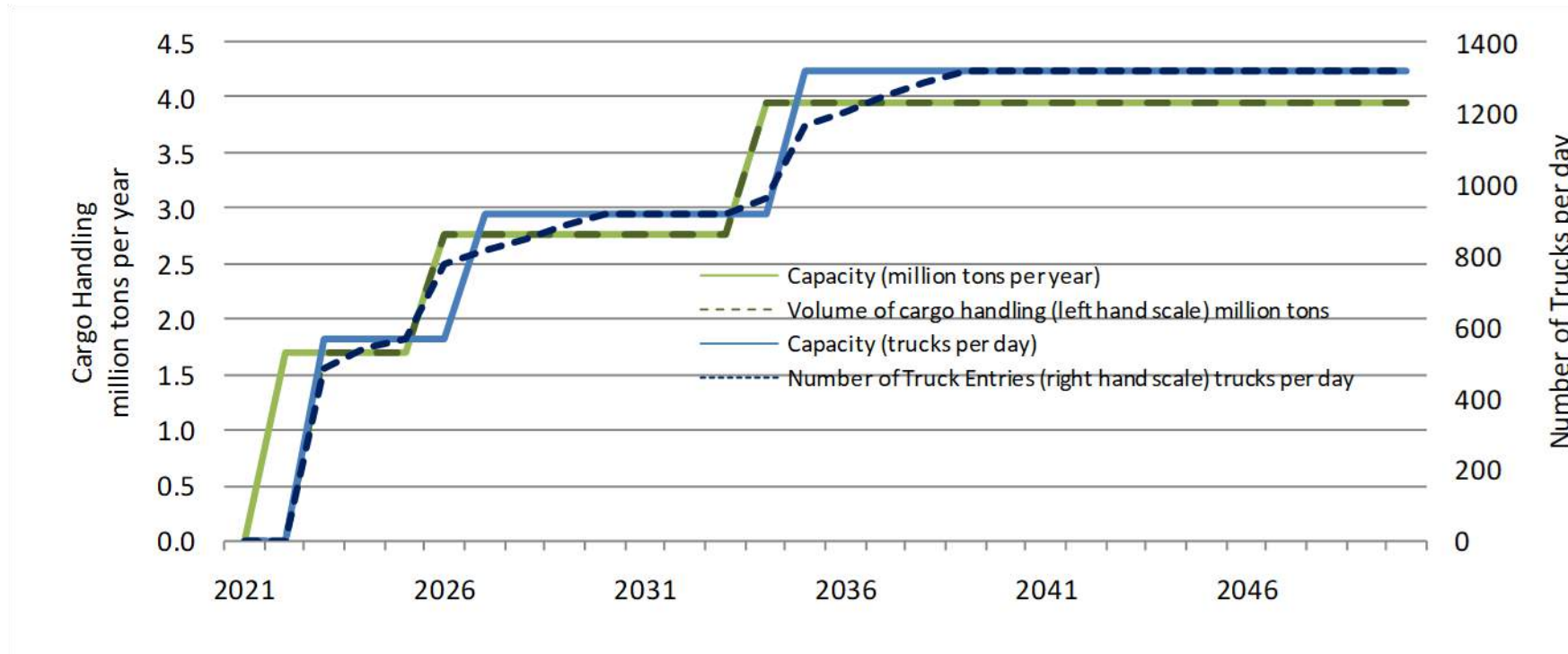
256. Traffic study involved the exercise of data gathering and analysis with respect to the movement of goods, passengers and vehicles through the land port. As Ramgarh is a green field site and there is no existing traffic data, the traffic data of Belonia the nearest land port was considered as a proxy to the volume of potential traffic through Ramgarh. Traffic survey was conducted by (i) manually classified counting (MCC) of vehicles and (ii) cross border survey of both goods and vehicles. It included the goods and vehicles destined for both imports and exports through Belonia. A direct traffic survey was carried out for one day in Belonia on 5 March 2020.

257. It is assumed that after completion of Phase 1, 50% of the capacity shall be taken up. After completion of Phase 2, and 3, remaining 50% capacity would be consumed. The actual profile of cargo handling at Ramgarh will be a function of:

- Induced traffic due to capacity additions
- Traffic diverted from other land ports and
- Capacity limitations and additions.

258. In some instances, it is likely to have a step jump due to addition of the new facilities or expansion of the port and in some instances, it may be restricted due to capacity availability, where it tends to grow at a level higher than the available capacity. The following figure shows the prediction of cargo volume handling by Ramgarh based on the above assumptions.

¹Feasibility Report of Ramgarh Land Port under Feasibility Study of Ramgarh and Detail Design of Bhomra and Ramgarh Land Ports



It is predicted that by 2050, the land port can handle about 4 million tons of cargo per year and 1,300 trucks per day.

Figure 37: Prediction of Traffic through Ramgarh

4.12.15 Historical, Cultural and Archaeological Sites

259. Noted religious institutions in Ramgarh upazila are Ramgarh Central Jami Mosque, Mahamuni Buddhist Monastery, Ramgarh Dakshineswari Kalibari.

260. Cultural services:

- Cultural (including use of nature as motif in books, film, painting, folklore, national symbols, architect, advertising, etc.)
- Spiritual and historical (including use of nature for religious or heritage value or natural)
- Recreational experiences (including ecotourism, outdoor sports, and recreation)
- Science and education (including use of natural systems for school excursions, and scientific discovery)
- Therapeutic (including Eco therapy, social forestry and animal assisted therapy)

5 Public Consultation and Disclosure

5.1 Introduction

261. Community participation always plays a key role for sustainable development. According to the guidelines of the DoE and the development partners, people's participation in planning and implementation phases of category A & B projects (usually red category) is essential to take necessary actions for minimizing any undue socio-cultural, political or any other conflicts and to address environmental issues. People have the right to know about what is going to happen in their surroundings. They must be informed about the positive and negative impacts for obtaining their perceptions, views and feed backs on the probable changes likely to happen within the study area.

262. Public consultation was initiated with an explicit objective to ensure peoples' participation right from the planning to operation through implementation stage of the project. The purpose of public consultation includes the following:

- To ascertain the public views on various environmental issues related to the project;
- To encourage and provide for people's participation in project implementation;
- To obtain new insight and site specific information and to appropriating possible mitigation measures based on local knowledge of the communities; and
- To ensure minimization of social conflicts regarding the project, if any.

5.2 Objectives of Public Consultation and Disclosure Meeting

263. The primary objective of the PCMs and PD is to incorporate the opinions and suggestions of the public and all other stakeholders at the project planning stage to ensure wider acceptability of the project. The key objectives are as follows:

- To provide information on the economic, environmental, and social benefits as well as potential negative impacts from the project;
- To ensure that stakeholders and local communities are engaged in a meaningful dialogue and are well informed prior to the decision of the project proponent as to the nature and extent of social and environmental impacts attributable to the proposed project with respect to planning;
- To ensure that the concerns of, and issues raised by the stakeholders, and local communities are incorporated and adequately addressed in the EIA study;
- To engage in a participatory exercise with stakeholders, and local communities and obtain expertise and local, traditional wisdom and knowledge from them in order to plan the mitigation measures; and
- To facilitate periodic opportunities to the principal stakeholders to offer their inputs on all key components of the project.

5.3 Approach and Methodology of Public Consultation and Disclosure Meeting

264. The field survey team visited the Ramgarh Land Port at Mahamuni, in Ramgarh upazila of Khagrchari Hill District and its adjoining areas and collected the ideas of different types of stakeholders about both the adverse and beneficial impacts and

its probable mitigation measures. More specifically, this was aimed at improving the study taking into account, the opinions of the people of the impacted areas.

265. A combination of mixed methods of information disclosure and consultation process was adopted at this stage of IEE/EIA preparation. To take free and unbiased opinions from the local people, both individual and group consultations were conducted. In this process, the method selected for consultation was basically designed keeping in mind the profile of the stakeholders, type of information desired and level of engagement required. In each consultation session the consultant introduced themselves, introduced the project and the purpose of engagement with the respective stakeholder.
266. Knowledgeable persons like farmer, businessmen, workers, public representative, shop owner, teacher, local elites, workers & staff and officer of LPDA and upazila level officers of concerned areas were identified and contacted. The team talked with 43 persons. Out of them 33 were local community people and 3 staff and officer of LPDA. They have also visited 5 upazila level offices and collected information and ideas of 7 officers/staff about the environmental and social impacts of the Ramgarh land port. The report included the lists of stakeholders; their name, address, profession, cell number and signature where available and signature sheet (Annex 5 & 6) & photograph of public consultation in Annex 7.

5.4 Public Disclosure Meetings (PDMs)

267. Public discussion meeting was held on 27th February, 2020 at 11.30 am in the conference room, Upazila parishad, Ramgarh Upazila, Khagrachari.
268. The meeting was attended by more than 60 people, which represent the affected persons, local community and relevant stakeholders including both govt. and private sector representatives.
269. The list of participants and attendance sheet has been provided as Annex 6 Public Consultations meeting outcome has been given in table below. The following key agenda was fixed for the public consulting.
- Brief description of the project
 - Expected key information about environmental and social benefits as well as potential negative impacts from different types of stakeholders and their suggestions to be taken during construction and operation phase of the land port;
 - Scope of the EIA study

Table 53: Public Consultations meeting outcome

Concerns	Replies
1. One of the participants named Abdullah Al Mamun (Farmer) raised some issues. According to him as the project will acquire agricultural land this will lead the farmers to become unemployed. Therefore, they are asking for preferential treatment to get	1. One of the participants named Abdullah Al Mamun (Farmer) raised some issues. According to him as the project will acquire agricultural land this will lead the farmers to become unemployed. Therefore, they are asking for preferential

Concerns	Replies
<p>job. They are hoping to get the compensation within short time with in proper amount. They are also concern about resettlement as some of them hold 'Ancholik dolil, without registration and mutation. There should be special consideration for poorer class.</p>	<p>treatment to get job. They are hoping to get the compensation within short time with in proper amount. They are also concern about resettlement as some of them hold 'Ancholik dolil, without registration and mutation. There should be special consideration for poorer class.</p>
<p>2. Mr. Sathoyai Ong Mog (General Secretary of Mahamuni Buddhist Monastery Committee) mentioned that the Land Port will acquire some part of the funeral ground/ crematory. According to them the whole place is of 66 decimals and they use 26 decimals for Projecting bamboo and cane for cremation. The entire Projection area and most part of the crematory is lost leaving only about 17 decimals as crematory. Further to this, the approach road blocked way to access the funeral ground from the town side. The Buddhist community reportedly own 4.01 acres of which 3.35 acres is temples and 0.66 is funeral area including Projection area. Now the Buddhist community is concerned how they will manage after acquisition of the remaining area and how connectivity will be provided between temple and the cremation site.</p>	<p>2. PD stated that the land for acquisition was selected with the assistance of LA section of Khagrachari DC office. During the selection of land, it was found 17 decimal land for cremation and this land was left from acquisition. The PD suggested that if they have any ownership document for more than 17 decimal land for cremation, it should be submitted to DC office in proper manner and stage. In response of approach road blocked, the DPD informed that the fencing between approach road and funeral is temporarily done only for construction period of the bridge. It will be removed after construction of the bridge. After the construction work and the port will be walled in three sides and the side faced towards the road will be open. The project authority opined that, the authority may provide any kind of lawful assistance. The project authority also mentioned that they have no intension to hamper the normal activity of the cremation and will provide better assistance from the authority in future</p>
<p>3. Mohammad Hridoy (Representative of agricultural workers) said about title holder land owner and non-title holder land owner (registered document and local document of land which is addressed as Anchalik Dolil). He asked to give compensation after discussed with both type of land owners to identify actual claimant. He also asked for compensation for structure and crops after identify actual claimant. He also asked for rehabilitation of affected people and provides job opportunity. Beside this, he requested to</p>	<p>3. In this issue, the PD said that already discussed about scope of job land ownership issues and only compensation will provide the affected people according to law of Bangladesh and the policy of World Bank. Affected people will not get any land for rehabilitation. Beside this, proper mitigation measures will be taken to reduce environmental pollution. DPD said that, Local people will get priority for job during construction period and conflict about land ownership will be solved by</p>

Concerns	Replies
<p>send any notice to both title holder land owner and nontitle holder land owner to inform and construct road if necessary. He said to minimize environmental pollution. Finally, he requested the local law enforcement department to help them if any crises arise.</p>	<p>local discussion.</p>
<p>4. Another PAP shared her story named Ushanu Marma (student). Her younger brother illegally recorded her father's land of which the whole family is the owner. But now her younger brother's name is in registered papers. They need a proper solution to this issue.</p>	<p>4. BLPA advised her to solve the issue as soon as possible with the help of legal and local officials as this is an internal problem and solve this by take with DC office or file a case against her brother.</p>

5.5 Findings of Survey

5.5.1 Findings of the consultation

270. The overall opinion of the participants which has been expressed during public consultation is positive toward development of land port like pre-construction, construction and operation phases. They are happy for the land port construction. As trades and business has already got new dimension ventilating new avenues of earnings. Scope of business will result in renting of houses, employment opportunities, road and communication developments.

271. There are some positive as well as negative impacts of the project reported by the local people. The advantages and disadvantages of the project reported by the stakeholder are given below:

272. Advantages:

- The land port construction will create employment opportunity for local people. Moreover, it will create more employment of local people during operation phase initiating new trade and business;
- All stake holders are hopeful to enhance the socio- economic condition of the people.
- It will develop medical facilities and educational facilities in the area
- Participants seem to be happy for the implementation of such project.

273. The disadvantages are noticed by local people:

- The project has impacted on road communication system and created traffic congestion.
- Environmental Pollution like noise, air, water etc.
- Mismanagement of solid and liquid waste
- Natural drainage system may also be disturbed
- Suggestion from local people

5.5.2 The suggestions are noticed by local people

- Proper management of air pollution, solid waste, noise pollution, etc.
- Take appropriate measures about the water logging during rainy season
- Prevent discharging of any liquid waste to nearby water bodies
- Proper management of solid waste

5.5.3 Findings of the meeting with Govt. Officials

274. Meetings were held with the local govt. officials and their valuable opinion were recorded and described as follows:

275. Kbd. Nasir uddin Choudhury, upazila Agriculture Officer mentioned saying that to attain the vision '21 industrialization is utmost essential but not in lieu of agriculture or environment.

276. To attain the vision '21 expansion of Trade & commerce, Import & Export, Industrialization and global connectivity is utmost essential but not in lieu of agriculture or environment. Proposed Ramgarh Land Port will be erected in 10 acres of land which covers mostly double cropped area and a few home stead areas. Cropped land is flash flood area. Mostly vegetable and maize are produced. Most of the farmers are share cropper who leads life hand to mouth. Homestead areas have thin population of trees. Ramgarh is part of hill tract mostly vale area. Expansion of road and creation of new connectivity may cause of trees cutting. Pre-construction, construction and post-construction may cause air pollution, sound pollution and constructional hazard might be kept within tolerable limit.

277. As measures of above-mentioned problems, he suggested as follows:

278. Ramgarh land port area will reduce net crop land of Ramgarh but it will ventilate multi-sectarian scope of development in Trade & commerce, Import & Export, Industrialization. It will facilitate marketing and mobility of agricultural products nationally and internationally.

279. Compensation for land and crops and alternative works scope may compensate loss and damage of affected farmers. Trees cutting from road sides and forest should have to be compensated by double replacement so that environmental balance remains sustainable. Establishment of Ramgarh Land Port Authority should take necessary protection to keep the pollution within tolerable limit.

280. Mr. Chakma, upazila Livestock Officer was in office tour at Khagrachari and talked over cell phone and expressed that it is a historical step to highlight Ramgarh's position as before. International Connectivity will enrich Ramgarh as well as nation. He also said that authority should take necessary steps to compensate affected people with due compensation and resettlement facilities.

281. Md. Azizur Rahman Anjum, upazila Samaj Seba Officer was in field tour, while talked over cell phone referred Md. Hanif to be talked. Mr. Hanif opined that erection of Ramgarh Land Port will contribute abrupt change in socio-economic condition of Ramgarh. Ramgarh will regain its lost image. Besides, urbanization may encourage criminal to promote addiction. He also suggested that project pre-implementation, implementation, post implementation pollution might be kept within tolerable limit. Law and order authority should be vigilant so that

international criminal gets no scope to promote addiction and smuggling etc.

282. Md. Anowar Hossain, Social Service Officer expressed that erection of Land port at Ramgarh Poursava will ventilate abrupt change in socio-economic condition of Ramgarh. Global connectivity will enrich its trade and commerce, social structure, sports and cultural position. Ramgarh was Sub-division in British Bengal but now it is degraded as upazila. With degradation of its administrative position its economy, education, sports and cultural heritage is degrading day by day. If Ramgarh Land Port is established to create connectivity with Tripura (India) it will be extended up to Nepal, Bhutan. The lost dignity of Ramgarh will be regained by its remarkable development.
283. Md. Sarwar Uddin, Asst. Commissioner (UNO In-charge) welcoming the team expressed that Ramgarh upazila is a place where Bangali, Tripura, Marma and Chakma people lives in harmony. Erection of Land Port at Ramgarh will enrich the area irrespective of caste & religion. It will offer both social impact and environmental impact. Hill cutting may be increased and landscape of the area may be changed. Land port activity might enrich socio-economic development of the area eradicating poverty. Land port authority might compensate affected settlers, farmers and share croppers.
284. Upazila administration and land department are ready to extend full support so that people of the area gets due compensation and development works are done peacefully. Non registered land owner's claim might get justified decision in presence of all parties so that none is derived from legal claim.
285. Kbd. Bijoy Kumar Das, upazila Fishery Officer was in training program at Savar, Dhaka. Talked over cell phone and expressed good hope about the Land port at Ramgarh. No impact on fishery.

5.6 Impacts identified

286. Adverse

- Air Pollution
- Noise Pollution
- Increase the possibility of accident
- Increase traffic congestion
- Pollution of river water

287. Beneficial

- Industrialization;
- Employment opportunity for the adjacent local community during construction and operation phases;
- Socioeconomic development;
- Land value around the project will be increased;
- Education, health, shopping, telecom, hotel & restaurant facilities will be increased;
- New business will be introduced.

6 Identification of Potential Impact

6.1 General Consideration

288. This section identifies and predicts the probable impacts on different environmental parameters due to construction and operation of the proposed sub project. After studying the existing baseline environmental scenario, environmental monitoring parameters, reviewing the process and related statutory norms, detailing the waste management measures, the major impacts can be identified during construction and operational phases. Relevant important aspects of environment are therefore selected which may have significant impacts due to project activities.

289. As is the case for most development projects, potential negative impacts sometime could be far more numerous than beneficial impacts. The regional and national benefits associated with the implementation of any development project are considered to fall outside the scope of EIA, and therefore not considered here. However, it is generally expected that these long-term benefits will ultimately trickle down to the local pollution and will make a contribution to an improvement in the quality of life. Likewise, the indirect benefits of strengthening technical capabilities of local persons through association with experts and other training elements which may form part of a project, have been considered to fall outside the scope of ESIA.

290. Every development project has both positive and negative impacts during construction as well as during operational phases. The impacts of Ramgarh Land Port have been studied and summarized as follows.

6.2 Impact during Construction Phase

- Site Preparation including land development
- Excavation and Backfilling
- Hauling of Earth Materials and Wastes
- Pilling, Cutting and Drilling
- Mixing of Concrete and Mortar
- Concrete Construction
- Solid Waste Management
- Waste management, wastewater from Construction activities or septic tanks being discharged to the river
- Runoff of oils to the river
- Erection of Steel Structures
- Internal and Access Road Construction
- Painting and Finishing
- Clean up Operations
- Construction of Infrastructural Facilities
- Landscaping and Afforestation
- Probable impact due to present COVID-19 pandemic

291. During construction phase, the major activities to be considered important for identification of impacts are:

292. Construction phase activities would have major impacts on land use, air quality, demography socioeconomics and noise quality. It could also develop minor impacts on water use, water quality and ecology. The possible cause and effect relationship between the different project activities on each of the major environmental components has been presented on Environmental Impact Matrix and has been summarized as below:

293. Following table possible cause and effect relationship of Environmental Impact Matrix during construction stage:

Table 54: Environmental Impact Matrix during construction stage

Project Activity	Affected Attribute	Nature of impact	High/Low	Direct/Indirect	Reversible/Irreversible
1.Civil Works	Water quality	Minor Change	Low to Medium	Direct	Reversible
	Hydrology	Depletion	low	Indirect	Reversible
	Air quality	Degradation	low	Direct	Partly reversible & irreversible
	Noise and odour	Increase and may cause some discomfort to local people	High	Direct	Reversible
	Employment	Improvement due to employment of both skilled and unskilled construction workers.	High	Direct	Reversible
	Land use	Minor Change	low	Direct	Irreversible
	Services	Improvement	Medium	Direct	Irreversible
2.Construction material storage and handling	Air quality	Degradation due to earth moving equipment.	High	Direct	Reversible
	Water Quality	Due discharge into river	Low to Medium	Direct	Partly reversible
	Noise level	Increase in noise level	High	Direct	Reversible
	Services	Improvement	Medium	Direct	Partly reversible & irreversible
	Employment	Improvement	Medium	Direct	Partly reversible & irreversible
3.Water	Ground	Depletion and	Low	Direct	Reversible

Project Activity	Affected Attribute	Nature of impact	High/Low	Direct/Indirect	Reversible/Irreversible
Requirement	water	quality deterioration			
4.Mechanical and Electrical erection	Noise	Increase in noise level	Low	Direct	Reversible
	Employment	Beneficial, local people may also get some direct/indirect Employment	Medium	Direct	Partly reversible & irreversible
	Services	Improvement, increase in their activities	Medium	Direct	Partly reversible & irreversible
5.Transport	Air quality	Degradation; dust Contamination	Low	Direct	Reversible
	Noise level	Increase (Degradation)	Low	Direct	Reversible
	Employment	Beneficial; local people may get direct/indirect employment	Low	Direct	Partly reversible & irreversible
	Services	Improvement, Commercial activity would increase	Medium	Direct	Partly reversible & irreversible
	Health	Some effect due to movement of vehicles	Low	Direct	Reversible
6. Staff Housing	Water Quality	Degradation	Low to Medium	Direct	Reversible
	Housing	Increase through more staff quarters	Low	Direct	Irreversible
	Services	Improvement	Low	Direct	Irreversible
	Health & Education	Improvement	Low	Direct	Partly reversible & irreversible
	Land use	Marginal alteration	Low	Direct	Irreversible

294. The environmental matrix points out each activity and its impact on specific environmental parameters. The final assessment of environmental quality is done after taking into account for the operational phase of the project and all pollution control measures to be implemented during the project work. This matrix is based on Leopold method. The vertical side of this matrix gives project activities and horizontal axis gives the environmental factors for physical, ecological and human environment. From the Table 54, significant impacts are identified. They are further

elaborated with characterization and assessment in Environmental Impact matrix for the construction phase is given below in Table 55.

Table 55: Characteristics of Environmental Impacts from Construction Activities

Activities	Air Quality	Noise	Surface Water	Ground Water	Climate	Land & Soil	Ecology	Employment
Site Clearing and land filling	*	*				*	*	*
Raw material storage & handling	*	*	*			*	*	*
Water requirement				*				
Water quality			*	*				
Ready-mix concrete preparation	*	*				*		
Transportation of raw materials	*	*	*			*		*
Construction activities on land	*	*			*	*	*	*
Staff housing	*	*	*					*

"*" indicates some environmental impact either beneficial or detrimental

6.3 Impact during Operational Phase

295. The environmental aspects and impact of The Ramgarh Land Port related to operational activities and services are identified. To the identification and assessment of the environmental aspects; the Ramgarh Land Port has a number of functions. These are:

1. Electricity generation
2. Vehicle movement
3. Office activities
4. Godown
5. Transports
6. Waste management
7. Wastewater from Construction activities or overflow from septic tanks
8. Traffic and Road safety

296. In each case, the function has been sub-divided into activities and, for each activity, a number of environmental aspects have been identified. These are the aspects which will be scored in order to identify those areas where improvements should be made as a priority.

297. The aim is to cover all the activities which take place in the Ramgarh Land Port and to ensure that all the potential environmental aspects and their impacts have been assessed.

298. Operational phase activities may have impacts of minor or major, positive or negative, on all the environmental disciplines as soils, surface and groundwater, hydrology, micrometeorology, land use, water use, water and air quality, terrestrial and aquatic ecology, socioeconomics and noise.

299. Based on the activities of operational phase of the Ramgarh Land Port, the operation phase impact matrix has been prepared and is given below (Table 56). This matrix is based on Leopold method. The vertical side of this matrix gives project activities and horizontal axis gives the environmental factors for physical, ecological and human environment.

Table 56: Operation phase impact matrix

Activities	Air Quality	Noise and Odor	Surface Water	Ground water	Service	Land and Soil	Climate	Socioeconomic	Aesthetic	Ecology	Employment	Health and Education
Solid waste disposal (indirect)	*	*	*	*		*						
Waste water disposal			*	*		*						
Buildings									*			
Operation of Compressors		*										
Vehicular Movement	*	*										
Air Emissions from Stack and another Unit process	*						*					
Water requirement				*								
Water quality			*	*								
Material handling					*						*	
Equipment breakdown	*	*	*		*							
Staff colony			*		*			*				*

"*" indicates some environmental impact either beneficial or detrimental

6.4 Impact on Air Quality

6.4.1 Impact during Construction

300. Impacts of construction activities on air quality are cause for concern mainly in the dry months due to dust particles. The main sources of emission during the construction period are the movement of equipment at the construction site and dust emitted during construction related activities. The dust emitted during the above-mentioned activities depend upon the ambient humidity levels. The impact will be for short duration and confined locally to the construction site. The composition of dust in this kind of operation is, however, inorganic and non-toxic in nature.

301. Particulate matter would be the predominant pollutant affecting the air quality during the construction phase. Undesirable gases such as SO₂, NO_x and CO would be generated mostly by the automobile traffic and construction machineries; however, this is not expected to lead to any tangible effects, particularly, if the traffic is scheduled to avoid unnecessary congestion in the area.

302. The impact of such activities would be temporary and restricted to the construction phase only. It is recommended that access roads be given suitable surface treatment to curb dust generation; sprinkling of water from trucks or other suitable means should be undertaken at the sites for suppression of fugitive dust. Suitable Port area actions should be initiated around the construction sites for arresting of air borne dust, which would also contribute in improving the aesthetic quality of the area. All the proposed measures that would greatly reduce the impact on the air quality during the construction phase of the project. The impact of such activities would be temporary and restricted to the construction phase only and will be confined within the project premises.

6.4.2 Impact during Operation

303. In operational phase, air quality degradation caused by the generator for electricity generation and machineries used for construction. The amount of pollutants emitted depends upon the type and quality of fuel used, burning method and operating conditions etc.

304. Most activities performed in RLP produce atmospheric emissions. Air emissions can be classified according to the nature of their sources:

Point sources:

- Boilers
- Ovens
- Storage tanks

Diffusive:

- Solvent-based
- Warehouses
- Spills
- Emissions from waiting trucks

6.5 Impact due to Solid Waste Generation

6.5.1 Impact during Construction

305. Project construction activities will result in generation of considerable amount of inert solid wastes, including lumber, excess concrete, metal and glass scrap.