



**GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH  
ROADS AND HIGHWAYS DEPARTMENT  
MINISTRY OF ROAD TRANSPORT AND BRIDGES**

**Sylhet-Tamabil Road Up gradation Project  
Draft Environmental and Social Impact Assessment**

October 2019



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## ABBREVIATIONS

|          |  |
|----------|--|
| AIIB     | Asian Infrastructure Investment Bank               |
| BBS      | Bangladesh Bureau of Statistics                    |
| BCR      | Building Construction Rules                        |
| BECA     | Bangladesh Environmental Conservation Act          |
| BECR     | Bangladesh Environmental Conservation Rules        |
| BWDB     | Bangladesh Water Development Board                 |
| CSC      | Construction Supervision Consultant                |
| DCs      | Deputy Commissioners                               |
| DGWT     | Deep Ground Water Table                            |
| DoE      | Department of Environment                          |
| EA       | Environmental Assessment                           |
| ECC      | Environmental Clearance Certificate                |
| EHSO     | Environmental, Health and Safety Guidelines        |
| EIA      | Environmental Impact Assessment                    |
| ESIA     | Environmental and Social Impact Assessment         |
| ESMP     | Environmental and Social Management Plan           |
| ESF      | Environmental and Social Framework                 |
| ESP      | Environmental and Social Policy                    |
| ESS      | Environmental and Social Standard                  |
| FAO      | Food and Agriculture Organization                  |
| FD       | Forest Department                                  |
| GOB      | Government of Bangladesh                           |
| GHG      | Greenhouse Gas                                     |
| IEE      | Initial Environmental Examination                  |
| IECs     | Important Environment Components                   |
| LGED     | Local Government Engineering Department            |
| LGRD & C | Local Government Rural Development and Cooperative |
| MOA      | Ministry of Agriculture                            |
| MOC      | Ministry of Communications                         |
| MOEF     | Ministry of Environment and Forest                 |
| NCS      | National Conservation Strategy                     |
| NEC      | National Environmental Council                     |
| NEP      | National Environmental Policy                      |
| NEMAP    | National Environmental Management Action Plan      |
| NGO      | Non-Governmental Organization                      |
| PAP      | Project Affected Persons                           |
| PDP      | Project Displaced Persons                          |
| PPE      | Personal Protection Equipment                      |
| PMU      | Project Management Unit                            |
| PIU      | Project Implementation Unit                        |

|      |                               |
|------|-------------------------------|
| RAP  | Resettlement Action Plan      |
| RHD  | Roads and Highways Department |
| RoW  | Right of Way                  |
| SDG  | Sustainable Development Goals |
| SGWT | Shallow Ground Water Table    |
| TA   | Technical Assistance          |

## WEIGHTS AND MEASURES

|                 |  |
|-----------------|--|
| dB(A)           | – A-weighted decibel                                 |
| ha              | – hectare  |
| km              | – kilometer  |
| km <sup>2</sup> | – square kilometer                                   |
| KWA             | – kilowatt ampere                                    |
| Leq             | – equivalent continuous noise level                  |
| µg              | – microgram  |
| m               | – meter  |
| MW (megawatt)   | – megawatt   |
| PM 2.5 or 10    | – Particulate Matter of 2.5 micron or 10-micron size |

## NOTES

- (i) In this report, "\$" refers to US dollars.  
(ii) —BDT refers to Bangladeshi Taka

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## PREFACE

*The premises of this Environmental and Social Impact Assessment (ESIA) Report are the Consultant services presentation of an analysis of data and conclusions, together with its appendices.*

*While Consultants have been deputed to assist the RHD / Executing Agency (EA) for the preparation of the ESIA.*

*The key elements of the ESIA Report focus on: Assessment of Compliance Guidelines of Environment Safeguards according to AIIB and GoB policy.*

## DISCLAIMER

*This Environmental and Social Impact Assessment (ESIA) Report of Sylhet-Tamabil Road Up-gradation Project under RHD has been prepared under the guidance of Team Leader of consultant. All the data used to prepare this Environmental and Social Impact Assessment*

*(ESIA) Report have been collected from the Project Development Plan (PDP). Some of the information has also been collected from the RHD personnel over telephone. Moreover, some information has been collected by the respective experts of consultant through intensive field visit which have been used in writing this report. If any information or data or any other things coincide with other project documents that are beyond our knowledge and fully coincidental, we express apology for that.*

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## EXECUTIVE SUMMARY

### E1. Background

This report is the Environmental and Social Impact Assessment (ESIA) report for 4 – laning of the 56.2 km Sylhet-Tamabil Road. The ESIA has been prepared in accordance with the requirements of the Government of Bangladesh (GOB) defined in the Bangladesh Environment Conservation Act (BECA), 1997 and the Asian Infrastructure Investment Bank (AIIB) Guideline. As agreed with the AIIB, the format of the ESIA follows the ADB recommendations as outlined in the ADB Good Practice Source book; Draft Working Document: November 2012.

In principle, the road is to be augmented and designed as a 4-lane highway replacing the existing 2-lane highway, but in a few locations of the existing alignment there will be some resettlement issues like - acquisition of land, rehabilitation of shops and boundary wall/buildings, particularly at the proposed new by passes. In addition to resettlement, there will be some environmental impacts like - loss of trees, use of agricultural land, changes to local drainage patterns etc.

### E2. The Project Area

The total length of the Sylhet-Tamabil Road is 56.2 km, from chainage 228.3km to 284.457km) which is part of the Dhaka-Narsingdi-Sylhet-Tamabil (DNST) National Highway 2 (N2) corridor. The Project road passes through Sylhet district of Sylhet division.

The overall objective of the Project is to generate economic benefits, as follows (i) This will be achieved by the facilitation of faster, safer and more economic links between Sylhet and Tamabil; (ii) The border crossing at Tamabil, between Bangladesh and India, has the potential to generate significantly increased traffic which will be accommodated by the improved road; (iii) Such increased traffic volumes would have a positive economic affect for the people; (iv) Further economic benefits could be expected from the increased use of the road corridor by commercial traffic travelling from/to other parts of Bangladesh and cross-border traffic travelling, in due course, from eastern India to Dhaka.

### E3. The Environmental and Social Impact Assessment

The ESIA for the road project of RHD has been prepared based on the Initial Environmental Examination (IEE) and the feasibility study of the project.

Government of Bangladesh (GoB) law and Asian Infrastructure Investment Bank (AIIB) policy require that the environmental and social impacts of development project be identified and assessed as part of the planning and design process, and that action be taken to reduce those impacts to acceptable levels. This is done through the screening/impact assessment process, which is an integral part of all AIIB lending operations, project development and implementation.

### E4. Categorization

An environmental assessment using a Rapid Environmental Assessment (REA) checklist for Sylhet-Tamabil road (Appendix-5) was conducted. As per AIIB guideline,<sup>1</sup> the Project is classified as **Category A** project and as per GOB guideline<sup>2</sup> as **Red category project**. This ESIA has been prepared in accordance with AIIB requirements for a category “A” project and also provides mitigation and monitoring measures to ensure potential impacts because of the project. Both for AIIB and GOB, an ESIA with Environment and Social Management Plan (ESMP) is required to determine the environmental and social impacts.

### E5. Elements of Environmental and Social Impact Assessment

Considering the nature of the project, the Bank requires the client to undertake an environmental and social assessment as per AIIB guidelines. The assessment considers

<sup>1</sup> AIIB Environmental and Social Policy and Environmental and Social Standards

<sup>2</sup> Environnement Conservation Roules, 1997, GOB

Project and detailed design alternatives to avoid or minimize physical and/or economic displacement and impacts on Indigenous People, and it includes an Environment and Social Management Plan. This project is in the Red Category as per DOE of GOB, so it requires Environment clearance from DOE. RHD has received Environment clearance from DOE as per Environment Conservation Rules, 1997, GOB and submitted the documents along with an IEE report and EIA report based on approved TOR from DOE.

## **E6. Impacts, Mitigation and Management**

The design of the road has included measures to minimize their environmental impacts. The road does not pass through any ecologically sensitive areas or areas of special habitat.

The majority of impacts during the construction period will be mitigated by good construction housekeeping measures implemented by the contractor. There will be standard procedures for the control and mitigation of emissions, such as dust, noise, exhaust fumes and liquid discharges from the construction sites, depots and work camps. All construction activities close to river will be controlled and the rivers will be protected from contamination. Wastewater from construction camps will be treated on site in settlement and aeration basins, where biological waste will be processed, before discharge. Septic sludge from toilets will be trucked to existing water treatment plants. Solid Waste will be disposed offsite in approved and managed waste disposal sites. Groundwater is not expected to be impacted by the project, as no deep excavations or major cuts for new roads and other developments are necessary. Water for the construction activities as well as the camps will be extracted in relatively small quantities from existing wells or the public supply system. Generally, water availability is unconstrained in the project area.

Noise and exhaust emissions will be minimized by the requirement for Contractors to use modern equipment and machinery complying with modern emission standards, and to maintain the equipment in good working order throughout the project. This will be prescribed in the equipment specifications in the tender documents. Nuisance to the public will be minimized by limiting work hours, with no night time works near housing and other sensitive uses. Where works are carried out in close vicinity to existing residential areas, additional measures, such as noise barriers or the installation of insulating windows, will be considered in accordance with good practice and in consultation with the community.

Construction material (hardcore, sand, spoil etc.) will be obtained from a variety of borrow pits that are not operated by the Contractors. However, in accordance with the ESMP all borrow pits must be approved by the supervision consultants (who will ensure that international good practice is followed). Construction access routes will be agreed prior to construction start and will not disturb any sensitive uses.

There are no forest areas or other sensitive areas near the proposed alignment. However, there will be significant loss of road side trees. It has been estimated that approximately 4000 mature trees need to be cut for 4-laning of the project road. There will be a major social reforestation program in line with standard RHD policies in close consultation with the Department of Forestry. Only replanting of indigenous species will be allowed within RoW of the road. Ecological impacts can be reversed by planting site specific tree species as per the directives of Social Forestry Act (2004).

The project road does not pass through any protected areas. Two protected areas are located within 3 km of the Right-of-Way (Khadimnagar National Park and Tilagorh Eco-Park), but neither will be negatively impacted by the widening of the road.

## **E7. Heritage sites**

There are no significant sites and structures of historical and archaeological importance along the road alignment. Some mosques and temples are close to or are within the proposed ROW and will need to be partially or completely relocated. Compensation for the same is considered in the Resettlement Framework. No known or recorded archaeological, historical or architectural structures or sites are affected by the road development. Any archeological remains discovered or unearthed during site preparation or construction is to be recorded by the Department of Archeology. Construction may need

to be temporarily stopped for this to be carried out. In any case, a Chance Finds procedure will be adopted during construction.

### **E8. Grievance Redress Mechanism (GRM)**

A time bound grievance redress mechanism (GRM) will be implemented under the project to facilitate receiving and addressing complaints from local public and concerned stakeholders. The GRM will allow for receiving complaints at four levels starting at the project site specific level, local road project level, project management level and legal court level. A grievance redress committee (GRC) will be established at the RHD and PIU to resolve complaints.

### **E9. Social Impact & Management**

There will be displacement of 1948 persons who are existing residents. Of the total 1948 PDPs, 800 (41.07%) are within the annual income group of above Tk. 100,000, and when the upper limit goes to above Tk. 200,000, the total number become 845 (Table IV-16), which is 43.38 % of the total PDPs. This implies that there is scope for providing the PDPs female family members with saving-credit opportunities. The 1461 PDPs who qualify for credit support will be paired with NGOs who provide credit, as income restoration and rehabilitation are important components of resettlement. Compensation to the PDPs will be provided as per GOB regulation and the Resettlement Framework of the project.

### **E10. Public Consultation**

Initial consultation with the community was conducted during the development of the Resettlement Framework in 2014 and again in August 2019 during preparation of the Resettlement Action Plan (RAP). The stakeholders were involved in developing the IEE/ESIA through discussions on-site, Focus Group Discussions (FGD), and public consultation, after which views expressed were incorporated into the IEE/ESIA and in the planning and development of the project. The consultation process will be continued and expanded during project implementation to ensure that stakeholders are fully engaged in the project and have the opportunity to participate in its development and implementation. A grievance redress mechanism is described within the IEE/ESIA to ensure any public grievances are addressed quickly.

### **E11. Environmental and Social Management Plan (ESMP)**

This ESIA has included an Environmental and Social Management Plan (ESMP) for the construction and operation periods which should be approved by the RHD. A monitoring program has also been prepared as part of the ESMP. The ESMP will be incorporated into the tender documents and will become part of the works contracts. The Contractors will be required to have permanent staff on site with the specific responsibilities of environmental and social management, reporting to the supervision engineers and their environmental and social specialist, and to the local authorities. During operation the noise, air pollution, water quality and other indicators will be regularly monitored in accordance with the monitoring plan of the ESMP. It is predicted that noise and air pollution impacts will not be significant at any sensitive locations. Cost of ESMP implementation has been estimated as 22.5885 million BDT (0.27 Million US \$).

For civil works, the contractor will be required to (i) establish an operational system for managing environmental and social impacts; (ii) carry out all of the monitoring and mitigation measures set forth in the ESMP; and (iii) implement any corrective or preventative actions set out in safeguards monitoring reports that the employer will prepare from time to time to monitor implementation of this ESIA and ESMP. The contractor shall allocate a budget for compliance with these ESMP measures, requirements and actions.

### **E12. Analysis of Alternatives**

As referred to above, the principle of the Feasibility Study is to utilize the existing 2-lane alignment and to widen to a divided 4-lane highway. Since most of the alignment has sufficient ROW, the proposed alignment largely follows the existing alignment. However, some changes to the alignment are proposed in a number of locations and these are referred to in Chapter V of the report. In general, these changes to the original alignment

have environmental (as well as resettlement) advantages.

### **E13. Implementation Arrangements**

The Ministry of Road Transport and Bridges is the executing agency (EA). RHD is responsible for providing support and guidance to the Contractor concerning performance criteria and road development planning. Implementation activities will be overseen by a Project Management Unit (PMU). Consultant teams are responsible for (i) detailed engineering design, contract documents preparation and safeguards facilitation; (ii) project management and administration support; (iii) assistance in supervising construction; (iv) strengthening of local governance, conducting required studies/surveys and (v) awareness raising on behavioral change in water, sanitation and solid waste management activities.

### **E14. Conclusion and Recommendations**

The project will have a number of environmental and social impacts during the construction and operation periods. Assuming effective implementation of the mitigation measures and monitoring requirements as outlined in the Environmental and Social Management Plan, the Project is not expected to have significant adverse environmental or social impacts. It should also be pointed out that significant benefits are anticipated; an all-weather transport route will link major population and industrial centers in the west of Bangladesh.

It is concluded that the project will have an overall beneficial impact after completion with respect to reducing transport cost and fuel consumption of vehicles and also improving socio-economic conditions along the length of project road. Construction of the civil works will have insignificant negative impacts on air quality, noise level, watercourses and soil during implementation, and impacts will be appropriately monitored and adequately mitigated. At present, this report has not identified any comprehensive, broad, diverse or irreversible adverse impacts caused by the proposed road.

## I. INTRODUCTION

### A. Background

1. The current situation across South Asia is that highways, waterways and railways stop at national borders, preventing the region as a whole being serviced by the transport network. The re-building of physical infrastructure across the region has been constrained by cross-border security fears, and this has resulted in the mutual forfeiting of economic benefits by the countries in the region. The N2 road links Dhaka, the administrative capital of Bangladesh, with Sylhet, the principal city and administrative capital of Sylhet Division and, slightly further towards the north-west, with Tamabil on the northern border with India. The N2 road passes through the urban centers of Bhairab Bazar, Jagadishpur and Shaistagonj before reaching Sylhet, which is the fifth largest city in Bangladesh. The road is designated as N2 National Highway. This is an important arterial road for the northeast of the country.

2. The border post at Tamabil sees cross-border traffic to and from India, which generally is composed of heavy commercial vehicles importing and exporting boulders and cobbles as aggregate and crushed stone respectively. Coal is also imported from India and stockpiled near the border post. Sylhet is located in the heart of tea growing country and is the hub of the tea industry in Bangladesh. It is also a center of the oil and gas sector in Bangladesh, and the largest natural gas reserves are located in Sylhet Division.

3. Because the prevailing poor road connectivity limits development, some strategic transport corridors must urgently be developed so that this potential may be realized. Investment in sub regional road connectivity not only contributes to the development of Bangladesh's own economy, but also contributes to increasing sub regional trade - especially benefitting Bangladesh, the northeastern states of Sylhet and India.

4. The overall objective of the Project is to generate economic benefits, as follows (i) This will be achieved by the facilitation of faster, safer and more economic links between Sylhet and Tamabil; (ii) The border crossing at Tamabil, between Bangladesh and India, has the potential to generate significantly increased traffic volumes should the road on the Indian side of the border be improved in line with the road in Bangladesh; (iii) Such increased traffic volumes would have a positive economic affect for the people who live and work within the project road corridor; (iv) Further economic benefits could be expected from the increased use of the road corridor by commercial traffic travelling from/to other parts of Bangladesh and cross-border traffic travelling, in due course, from eastern India to Dhaka.

5. The Roads and Highways Department (RHD) under the Government of Bangladesh (GOB) Ministry of Road Transport and Bridges (MORTB) is the project implementing agency, and responsible for the Sylhet-Tamabil Road Upgradation Project (STRUP), involving consultancy services for preparing the feasibility studies and detailed engineering designs of the proposed project. The project is defined as a 56.2km section of road from Sylhet-Tamabil.

### B. Project Scope

6. Sylhet-Tamabil road (about 56.2 km in length including Box culver 48, PC Bridge 18, Foot over Bridge 9 and RC Bridge 9) from chainage 228.3km to 284.457km) is part of the Dhaka-Narsingdi-Sylhet-Tamabil (DNST) National Highway 2 (N2) corridor. DNST is one of the most important corridors in the country connecting the entire northeastern districts with Sylhet and Sylhet Division and Dhaka and with Tamabil on the northern border with India. However, the corridor mainly serves the domestic economy connecting Sylhet Division with the rest of the country.

7. Currently, the Sylhet-Tamabil road is already an important trade route for bilateral trade between Bangladesh and Meghalaya and Assam states of India. The border post at Tamabil is one of the most important land ports in Bangladesh. More than 2.5 million tons of stone and 2.0 million tons of coal enter Bangladesh through this border post. Main import items are coal, lime stone, boulder, stone, glass sand, fruits and raw hides. Export items include food and beverage items, plastic goods and bricks. The abrupt deterioration rates of

the road condition are attributed to the substantial increased traffic flows, especially the significant amount of heavy commercial vehicle flows importing boulders and cobble stones and exporting crushed stone back.

### C. Purpose of the Report

8. The Environmental and social Impact Assessment (ESIA) aims to provide guidance on safeguard screening, assessment, institutional arrangement, and process to be followed for components of the project. This ESIA (i) describes the project and its component; (ii) explains the general anticipated environmental impacts and mitigation measures for the project; (iii) specifies the requirements that will be followed in relation to screening and categorization, assessment, and planning, including arrangements for meaningful consultation with affected people and other stakeholders and information disclosure requirements; (iv) assesses the capability of the project proponents to implement national laws and AIIB's requirements, and identifies needs for capacity building; (v) specifies implementation procedures, institutional arrangements, and capacity development requirements; and (vi) specifies monitoring and reporting requirements. Moreover, this ESIA is to ensure, in line with AIIB Environmental and Social Framework (ESF) that the National Highway project, in the entirety of its project cycle, will not deteriorate or interfere with the environmental sensitivity of the project area, but rather improve environmental quality.

### D. Categorization

9. An environmental assessment using a Rapid Environmental Assessment (REA) checklist for Sylhet-Tamabil road (Appendix 5) was conducted. The Sylhet-Tamabil road project is classified as Category A in accordance with AIIB guidelines<sup>3</sup> and in the Red category as per GOB guidelines<sup>4</sup>. This Environmental and Social Impact Assessment (ESIA) has been prepared in accordance with AIIB requirements for a Category A project and provides an Environmental and Social Management Plan (ESMP) to ensure potential impacts are mitigated and monitored.

10. In general, impacts were determined not to be significant or irreversible, and precautionary measures have been taken (and incorporated into guidance, management plans and implementation frameworks) to avoid or reduce them.

### E. Scope of this report

11. The Project requires that any proposed development adhere to the laws and regulations of Bangladesh. The Project is then subject to approval under the Government of Bangladesh's Environment Conservation Act (1995) (ECA) and Environment Conservation Rules (1997).

12. The ESIA report aims to provide guidance on safeguard screening, assessment, institutional arrangement, and process to be followed for components of the project. This ESIA:

- describes the project and its component;
- explains the general anticipated environmental impacts and mitigation measures for the project;
- specifies the requirements that will be followed in relation to screening and categorization, assessment, and planning, including arrangements for meaningful consultation with affected people and other stakeholders and information disclosure requirements;
- assesses the capability of the project proponents to implement national laws and AIIB's requirements, and identifies needs for capacity building;
- specifies implementation procedures, institutional arrangements, and capacity development requirements; and
- Specifies monitoring and reporting requirements. Moreover, this ESIA ensures that

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<sup>3</sup> AIIB Environmental and Social Policy and Environmental and Social Standards

<sup>4</sup> Environnement Conservation Roules, 1997, GOB

the project, in the entirety of its project cycle, will not degrade the environmental condition of the project area, but rather improve environmental quality.

13. This report fulfils the requirements of ESIA under the provisions of the ECR. The ESIA identifies adverse environmental and social impacts and issues associated with undertaking the proposed project. It provides an outline of the potential positive and negative impacts of the Project and proposes suitable mitigation and management measures.

14. The project has been designed as a 4-lane highway replacing the original 2-lane highway constructed some years ago. Most of the ROW is sufficient for the widening, but in many locations the acquisition of land and buildings will be necessary. In addition to the resettlement issue there will be a range of environmental and social factors to take into account: loss of trees, loss of agricultural land, and changes to local drainage patterns for example.

15. Presently, Sylhet-Tamabil Road is a 2-lane road that passes through Sylhet district of Bangladesh in the northeast part of the country. In general, the road is in good condition and the traffic flows are within the capacity of the road.

## F. Approach and Methodology

16. The primary purpose of the ESIA is to investigate and describe environmental and social impacts of the proposed project. Specifically, the study aims to predict the potential impacts of the project activities and recommend mitigation and abatement measures (in the pre-construction, construction, after completion of works and operational stages of development) that are considered potentially adverse to the surrounding environment.

17. In general, this ESIA intends to:

- Examine and describe the existing status of the various ecological, physical and human related components surrounding the project area;
- Predict the potential significant impacts of the project on the surrounding environment during the pre-construction, construction, after completion of works, operations and maintenance stages and recommend appropriate mitigation and abatement measures; and
- Identify residual impacts of the project and recommend appropriate short-term and long-term management plans.

## G. Structure of This Report

18. Following the AIIB Environmental and Social Policy, the Report is structured as follows:

### Executive Summary

- |                    |   |
|--------------------|---|
| <b>Chapter I</b>   | Introduction provides the background on the project, purpose of this report, approach and methodology   |
| <b>Chapter II</b>  | Policy, Legal, and Administrative Framework presents a review of relevant national laws and policies, international environmental and Social obligations, and AIIB's environmental requirements, procedure of environmental clearance, environmental categorization |
| <b>Chapter III</b> | Description of the project provides a brief description of the Project, the location, size and need, description of project components  |
| <b>Chapter IV</b>  | Description of the Baseline Environment includes details on the baseline data for environmental conditions in the project area (current features and conditions, pre-project)   |
| <b>Chapter V</b>   | Anticipated Potential Project Impacts identifies the potential environmental, economic, and social impacts from pre-construction, construction, after completion of works and operation phase.  |

- Chapter VI** Stakeholder Consultation and Information Disclosure discusses the issues raised during the consultations, proposed actions to address them, and the information needed to disclose to the public.
- Chapter VII** Grievance Redress Mechanism describes the process of addressing complaints
- Chapter VIII** This chapter includes the environmental and social management plan that includes the impacts of the proposed project on environment and society is described. All the anticipated impacts in pre-construction stage, construction stage, after completion of works and operational stage are described here.
- Chapter IX** This chapter includes the conclusion and some recommendations are suggested here about the proposed project.

## II. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

### A. Introduction

19. This section of the ESIA details the Administrative Framework for the Project, covering national requirements as well as applicable international treaties and conventions. The intent of this section is to lay out the regulatory and non-regulatory performance requirements for all stages of the project. For the purposes of this report, only those regulatory elements directly relevant to the proposed Project will be discussed.

### B. Environmental Legislation Framework

#### a. Overview of the project Approval Process

20. Key legislation governing the environmental approvals process for the proposed project is the Bangladesh Environment Conservation Act, 1995 (BECA, 1995)<sup>5</sup> and the Environment Conservation Rules (ECR, 1997)<sup>6</sup>.

#### b. Environmental Approval Framework

21. Key milestones in the approvals process are outlined in Figure II.1. These comprise:
- **Project Authorization Letter:** Formal authorization of the Project by the owner is required in order for the environmental approvals process to formally commence.
  - **No Objection Certificate (NOC):** A NOC must be received from the Deputy Commissioner (DC) in the project area before the SCC application can be made.
  - **Site Clearance Certificate (SCC):** DoE will issue a SCC upon approval of the IEE study (note that the IEE submission is to include the Project Authorization Letter, NOC, and SCC application form). The SCC will include a ToR for the IEE/EIA study, and typically provides authorization for site establishment works to commence.
  - **Environmental Clearance Certificate (ECC):** DoE will issue the ECC upon approval of the IEE/EIA study (including associated ESMP). The ECC allows project construction to commence and contains specific approvals requirements for matters such as pollution control and environmental monitoring.

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<sup>5</sup> The Act was amended by Act Nos 12 of 2000, 9 of 2002, and 50 of 2010.

<sup>6</sup> The ECR was amended in 2002, 2005, 2010 and 2017.

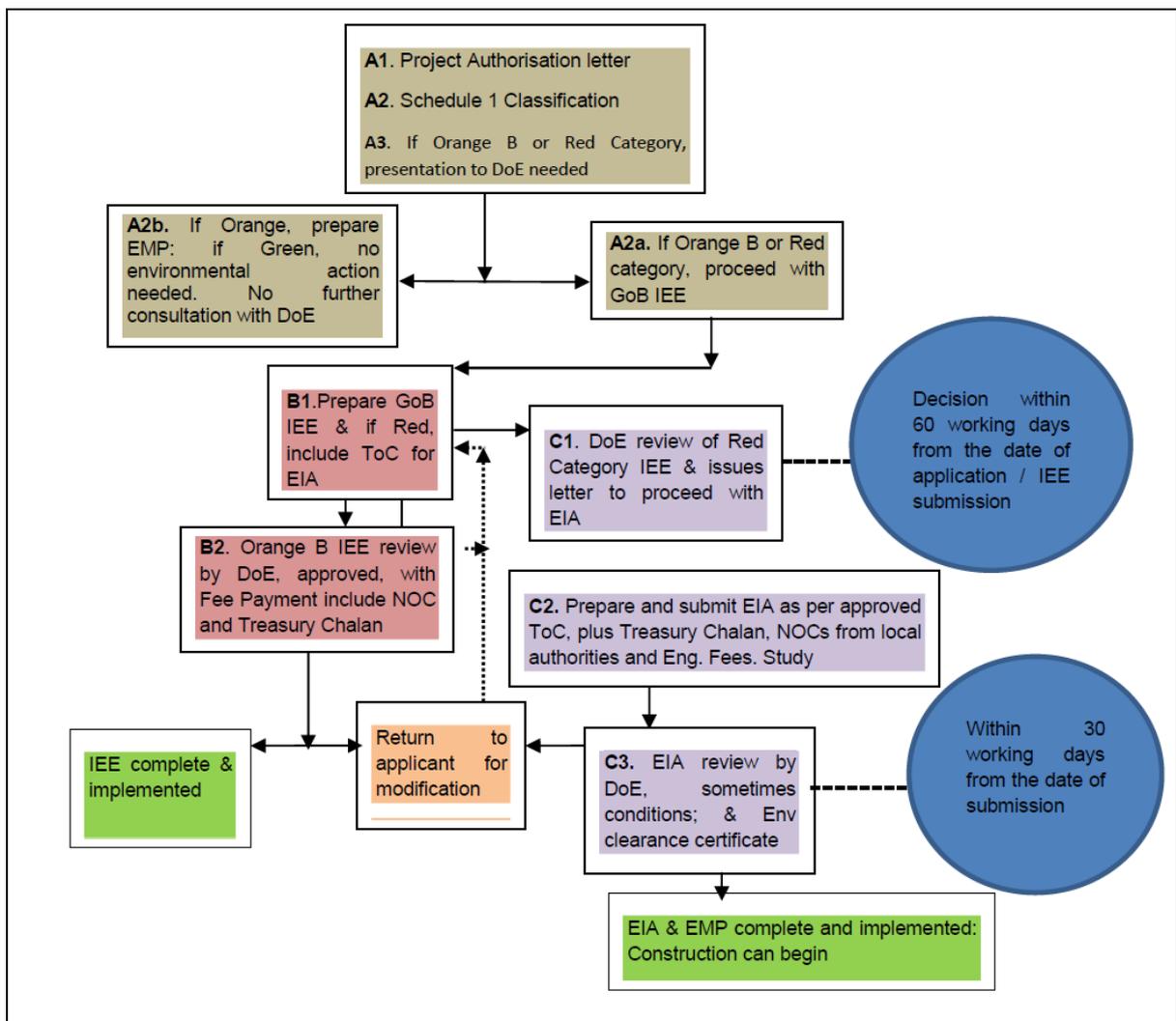


Figure II-1: Government of Bangladesh Environmental Assessment Process

### C. National Relevant Policies and Strategies

22. This section summarizes the National Laws and describes the procedure for obtaining environmental permits to allow project implementation. Over the years, the Government of Bangladesh has enacted environmental acts, rules, policies and regulation toward imposing restrictions facilitating minimization / mitigation of likely impacts due to development projects. The most important Act is Environmental Conservation Act, 1995 (ECA, 1995) and Environmental Conservation Rules (ECR, 1997).

#### a. National Environmental Policy

23. The National Environmental Policy was adopted in 1992 and is now under revision. It embraces different sectors related to agriculture, forest, power, health, transport, housing etc. The central theme of policy is to ensure protection and improvement in environment. The policy gives a thrust to sustainable development and long-term use of natural resources. The National Environment Policy contains policy statements and strategic options with regard to population and land-use management, management and utilization of natural resources and other socio-economic sectors, as well as the necessary arrangements for the implementation of the policy. The policy enables:

- the country to strike a dynamic balance between population and resources while complying with the balance of ecosystems;
- to contribute to sustainable and harmonious socio-economic development such that, both in rural and urban areas, and well-being in a sound and enjoyable environment; and
- To protect, conserve and develop natural environment and social.

**b. Environmental Conservation Act (ECA), 1995**

24. The ECA is currently the main legislation relating to environment protection in Bangladesh. This Act is promulgated for environment conservation, environmental standards development and environment pollution control and abatement. The main objectives of ECA are:

- Conservation and improvement of the environment; and
- Control and mitigation of pollution of the environment.

25. The main focuses of the Act can be summarized as:

- Declaration of ecologically critical areas and restriction on the operations and processes, which can or cannot be carried out/ initiated in the ecologically critical areas (ECA);
- Regulations in respect of vehicles emitting smoke harmful for the environment;
- Environmental clearance;
- Regulation of industries and other development activities' discharge permits;
- Promulgation of standards for quality of air, water, noise and soil for different areas for different purposes;
- Promulgation of a standard limit for discharging and emitting waste; and
- Formulation and declaration of environmental and social guidelines.

26. Before any new project can go ahead, as stipulated under the ECA, the project promoter must obtain Environmental Clearance from the Director General (DG), DoE. An appeal procedure does exist for those promoters who fail to obtain clearance. Failure to comply with any part of this Act may result in punishment to a maximum of 5 years imprisonment or a maximum fine of Tk.100, 000 or both. The DoE executes the Act under the leadership of the DG.

- ***Environmental Conservation Act (Amendment 2000)***

27. The Bangladesh Environment Conservation Act Amendment 2000 focuses on ascertaining responsibility for compensation in cases of damage to ecosystems, increased provision of punitive measures both for fines and imprisonment and the authority to take cognizance of offences.

- ***Environmental Conservation Act (Amendment 2002)***

28. The 2002 Amendment of the ECA elaborates on the following parts of the Act:

- Restrictions on polluting automobiles;
- Restrictions on the sale, production of environmentally harmful items like polythene bags;
- Assistance from law enforcement agencies for environmental actions;
- Break up of punitive measures; and
- Authority to try environmental cases.

- ***Environmental Conservation Act (Amendment 2010)***

29. This amendment of the act introduces new rules and restriction on:

- No individual or institution (Gov. or Semi Gov, / Non Gov. / Self Governing) can cut any Hill and Hillock. In case of national interest; it can be done after getting clearance from respective the department
- Owner of the ship breaking yard will be bound to ensure proper management of their hazardous wastes to prevent environmental pollution and Health Risk
- No remarked water body cannot be filled up/changed; in case of national interest; it can be done after getting clearance from the respective department; and
- Emitter of any activities/incident will be bound to control emission of environmental pollutants that exceeds the existing emission standards.

**c. Environment Conservation Rules, 1997 (Amended in 2002)**

30. These are a set of rules, promulgated under the ECA, 1995 and its amendments.

The Environment Conservation Rules provide categorization of industries and projects and identify types of environmental assessment required against respective categories of industries or projects. The Rules set:

- The National Environmental Quality Standards (NEQS) for ambient air, various types of water, industrial effluent, emission, noise, vehicular exhaust etc.;
- The requirement for and procedures to obtain environmental clearance; and
- The requirement for IEE and EIA according to categories of industrial and other development interventions.

31. The Environment Conservation Rules, 1997 were issued by the GoB in exercise of the power conferred under the Environment Conservation Act (Section 20), 1995. Under these Rules, the following aspects, among others, are covered:

- Declaration of ecologically critical areas;
- Classification of industries and projects into four categories;
- Procedures for issuing the Environmental Clearance Certificate (ECC); and
- Determination of environmental standards.

32. Rule 3 defines the factors to be considered in declaring an 'ecologically critical area' as per Section 5 of the ECA (1995). It empowers the Government to declare the area as the Ecologically Critical Areas (ECA), if it is satisfied that the ecosystem of the area has reached or is threatened to reach a critical state or condition due to environmental degradation. The Government is also empowered to specify which of operations or processes may be carried out or may not be initiated in the ecologically critical area. Under this mandate, the Ministry of Environment, Forest and Climate Change (MoEFCC) has declared Sundarbans, Cox's Bazar-Tekhnaf Sea Shore, Saint Martin Island, Sonadia Island, Hakaluki Haor, Tanguar Haor, Marzat Baor and Gulshan-Baridhara Lake as ecologically critical areas and prohibited certain activities in those areas.

33. Rule 7 of the 1997 ECR provides a classification of industrial units and projects into four categories, depending on environmental impact and location. These categories are:

- Green;
- Orange A;
- Orange B; and
- Red.

34. The categorization of a project determines the procedure for issuance of an Environmental Clearance Certificate (ECC). All proposed industrial units and projects that are considered to be low polluting are categorized under "Green" and shall be granted Environmental Clearance. These are Orange B for work that requires Initial Environmental Examination (IEE) and Red for work that requires full environmental assessment (EA).

35. A detailed description of those four categories of industries has been given in Schedule-1 of ECR'97. Apart from general requirement, for every Red category proposed industrial unit or project, the application must be accompanied with feasibility report on Initial Environmental Examination, Environmental Impact Assessment based on approved TOR by DOE, Environmental Management Plan (EMP) etc.

36. Depending upon location, size, and severity of pollution loads, projects/activities have been classified in ECR, 1997 into four categories: Green, Orange A, Orange B, and Red respectively, to nil, minor, medium, and severe impacts on important environmental components (IECs).

37. **Relevance to the project** - In accordance with the Environment Conservation Rules (ECR) of 1997, the Project is classified as Red Category, requiring an Environmental Impact Assessment (EIA) to obtain clearance for construction from the Director General (DG) in the manner prescribed by the Rules'.

**d. National Water Policy, 1999**

38. The policy aims to provide guidance to the major players in water sector for ensuring

optimal development and management of water. The policy emphasizes efficient and equitable management of water resources, proper harnessing and development of surface and ground water, availability of water to all concerned and institutional capacity building for water resource management. It also addresses issues like river basin management, water rights and allocation, public and private investment, water supply and sanitation and water need for agriculture, industry, fisheries, wildlife, navigation, recreation, environment, preservation of wetlands, etc. The policy has several clauses related to the project for ensuring environmental protection.

#### e. Other National Legal Instruments

39. The Ministry of Environment, Forests and Climate Change (MoEFCC) prepare the environmental policies. MoEFC also has formulated regulation toward clearance of projects from environmental angles based on environmental impact assessment report. The Department of Environment (DoE) is responsible for environmental issues while forest issues are looked after Forest Department (FD). Over the years the MoEFC has adopted number of legal instrument in the form Acts for the protection and conservation of the environment. Table II.1 summarizes the Environmental Legislation applicable to the project.

**Table II-1: Summary of Environmental Legislations Applicable to the proposed project**

| No. | Environmental Legislation / Act                               | Objective   | Relevance to the Project   | Responsible Institution                                 |
|-----|---|---|--|---|
| 1   | National Environmental Policy, 1992                           | Ensure that development components do not pollute the environment or degrade resources. It sets out the basic framework for environmental action together with a set of broad sectoral action guidelines. | Restriction on operations which cannot be initiated in ecological critical areas<br><br>Regulation on vehicles emitting smoke which is harmful to the environment<br><br>Follow standards on quality of air, water, noise and soil<br><br>Sets limits for discharging and emitting waste | Ministry of Environment and Forests, and Climate Change |
| 2   | National Environmental Management Action Plan (NEMAP), 1995   | An action plan to identify key environmental issues affecting Bangladesh, identifies actions for reducing the rate of environmental degradation and improve quality of life.                              | Sectoral agencies to coordinate with MoEFCC in preparing environmental guidelines  | Ministry of Environment and Forests, and Climate Change |
| 3   | Environment Court Act, 2000 and subsequent amendments in 2003 | Establishment of Environment Court for trial of an offence or for compensation under environmental law, such as environment pollution.  | Option to affected persons for grievances related to environment safeguards.   | Ministry of Environment and Forests, and Climate Change |
| 4   | The Forest Act (1927) and Forest (Amendment) Act (2000, 2012) | Conservation of Reserve, Protected, Rural and Unclassified State Forests, Forest Ecology and Wildlife;  | Requires clearances for any project within forest areas and clearances for any felling, extraction, and transport of forest produce.   | DOE, MOEF and Forest Department                         |
| 5   | National Forest   | To conserve existing forests  | Incorporate tree   | Department of   |

| No. | Environmental Legislation / Act   | Objective  | Relevance to the Project  | Responsible Institution  |
|-----|---|--|---|--|
|     | Policy (1994)   | and bring about 20% of the country's land area under the Forestation Programme and increase reserved forests by 10% per year until 2015  | planting in the subproject<br><br>Clearance for any felling, extraction, and transport of forest produce  | Forests  |
| 6   | The Bangladesh Wildlife (Conservation & Security) Act, 2012                             | To conserve and protect wildlife in Bangladesh including designation of protected areas. Conservation of wildlife, Wildlife Sanctuaries, National Parks, Eco-Parks in Forests and elsewhere.   | Consultation and necessary permits required if the project would affect the wildlife in the project area.   | Forest Department, MOEF and Bangladesh Wild Life Advisory Board          |
| 7   | Vehicle Act, 1927<br>Motor Vehicles Ordinance, 1983<br>Bengal Motor Vehicle Rules, 1940 | Ensure that development components do not pollute the environment or degrade resources.  | Road safety, Licensing, monitoring maintenance standard of vehicles, Pollution control  | Bangladesh Road Transport Authority (BRTA)/ Police/ Civil Administration |
| 8   | Natural Water Bodies Protection Act (2000)  | Conservation of natural and man-made wetlands  | Secure clearance certificate on water resource development project  | Ministry of Water Resources  |
| 9   | Wetland Protection Act 2000   | Advocates protection against degradation and resuscitation of natural water-bodies such as lakes, Haor's, ponds, beels <sup>7</sup> , khals, tanks, etc. affected by man-made interventions or other causes. Prevents the filling of publicly-owned water bodies and depressions in urban areas for preservation of the natural aquifers and environment. Prevents unplanned construction on riverbanks and indiscriminate clearance of vegetation on newly accreted land. | In case of impact on the natural water bodies within the project area   | Ministry of Water Resources  |
| 10  | Bangladesh Labor Law, 2006  | It is a comprehensive law covering labour issues such as: conditions of service and employment, youth employment, benefits including maternal benefits, compensation for injuries, trade unions and industrial relations, disputes, participation of workers in company's profits, regulation of safety of dock workers, penalty procedures, administration and inspection.  | Compliance to provisions on employment standards, occupational health and safety, welfare and social protection, labor relations and social dialogue, and enforcement.<br><br>Prohibition of employment of children and | Ministry of Labor and Employment   |

<sup>7</sup> A beel is a billabong or a lake-like wetland with static water (as opposed to moving water in rivers and canals - typically called khals), in the Ganges - Brahmaputra flood plains of the Eastern Indian states of West Bengal, and Assam and in the country of Bangladesh.

| No. | Environmental Legislation / Act   | Objective   | Relevance to the Project   | Responsible Institution   |
|-----|---|---|--|---|
|     |   | This Act pertains to the occupational rights and safety of factory workers and the provision of a comfortable environment for working. It also includes rules on registration of labourers, misconduct rules, income and benefits, health and fire safety, factory plan | adolescents.   |   |
| 11  | Bangladesh Labor Rules, 2015  | Includes rules on registration of laborers, misconduct rules, income and benefits, health and fire safety, factory plan   | Contractors to implement occupational health and safety measures<br><br>Contractor will be liable for compensation for work-related injuries | Department of Labor   |
| 12  | Removal of Wreckage and Obstructions in inland Navigable Water Ways Rules (1973).   | Removal of Wrecks and Obstructions from inland Navigable Waterways.   | Setting-up emergency response procedures   | Bangladesh Inland Water Transport Authority (BIWTA)   |
| 13  | Bangladesh Climate Change Strategy and Action Plan of 2009  | Enhances the capacity of government ministries, civil society and private sector to meet the challenges of climate change   | Integrate adaptation measures for buildings in consideration of extreme climatic events  | Ministry of Environment, Forests and Climate Change   |
| 14  | The Land Acquisition Act, (1894) and Amendments (1993, 1994, 2004) Acquisition and Requisition of Immovable Property Ordinance 1982. Amendments Acquisition and Requisition of Immovable Property Ordinance 2017. | Ensure that development components; relating land acquisition and compensation  | Current GOB Act & guidelines, relating land acquisition and compensation   | Civil Administration (Deputy Commissioner of the District), Revenue Department, LGRD and C, Ministry of Land. |
| 15  | National Disaster Management Act of 2012  | Establishes a framework for managing disasters in a comprehensive way.  | Setting-up emergency response procedures   | Ministry of Disaster and Relief   |

#### D. Applicable International Agreements

40. Aside from the legal framework on environment, Bangladesh is also a party to several international conventions, treaties, and protocols related to environmental protection. The applicable international conventions, treaties, and protocols are described in Table II.2.

**Table II-2: International Conventions, Treaties, and Protocols Signed by Bangladesh**

| Conventions   | Years        | Ratified/Accessed (AC)/Accepted (AT)/Adaptation (AD) | Relevance   |
|---|--------------|--|---|
| International Plant Protection Convention (Rome,) & Plant Protection Agreement for SE Asia and Pacific (1999 Revision)                                    | 1951<br>1999 | 01.09.1978<br>04.12.1974 (AC)<br>(Entry into Force)  | Ensuring that the Project work or construction materials do not introduce plant pests   |
| Convention on Wetlands of International Importance ("Ramsar Convention":1971)   |              | 20.04.1992<br>(ratified)                             | Protection of significant wetland and prevention of draining or filling during construction   |
| Convention on Biological Diversity, (Rio de Janeiro, 1992.)   | 1992         | 05.06.1992   | Protection of biodiversity during construction and operation.   |
| Convention on Persistent Organic Pollutants, Stockholm.   | 2001         | In process   | Restrict use of different chemicals containing POPs.  |
| United Nations Framework Convention on Climate Change, (New York, 1992.)  | 1992         | 15.04.94   | Reduction of emission of greenhouse gases.  |
| Convention on Biological Diversity, (Rio De Janeiro, 1992.)   | 1992         | 03.05.94   | Conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. |
| Kyoto protocol to the United Nations Framework Convention on Climate Change   |              | 21.8.2001 (AC)<br>11.12.1997 (AD)                    | Reduction of emission of greenhouse gases.  |
| International Convention for Protection of Birds, Paris   | 1950         | Signed   | Protection of the birds in their wild state.  |
| Convention Concerning the Prevention and Control of Occupational Hazards caused by Carcinogenic Substances and Agents, Geneva.                            | 1974         | Signed   | To protect workers against hazards arising from occupational exposure to carcinogenic substances and agents.  |
| Convention Concerning the Protection of Workers Against Occupational Hazards in the Working Environment due to Air Pollution, Noise and Vibration, Geneva | 1977         | Signed   | Protection of workers' health against occupational hazards in the working environment due to air pollution, noise and vibration.  |
| Convention Concerning Occupational Safety and Health and the Working Environment, Geneva.   | 1981         | Signed   | Ensuring occupational health and safety of workers in all branches of economic activity.  |
| Vienna Convention for the Protection of the Ozone Layer, Vienna   | 1985         | 02.08.90 (AC)<br>31.10.90 (entry into force)         | Preventing human activities that may have adverse effects on ozone layer.   |
| Convention Concerning Occupational Health Services, Geneva.   | 1985         |  | Convention Concerning Occupational Health Services, Geneva.   |
| Montreal Protocol on Substances that Deplete the Ozone Layer, Montreal.   | 1987         | 31.10.90<br>(entry into force)                       | Reduction of the abundance of the substances that deplete the ozone layer in the atmosphere, and thereby protect the earth's fragile ozone Layer.                                   |
| Convention Concerning Safety in the Use of Chemicals at Work,   | 1990         | Signed   | Regulating the management of chemicals in the workplaces I  |

| Conventions  | Years    | Ratified/Accessed (AC)/Accepted (AT)/Adaptation (AD)  | Relevance   |
|--|----------|---|---|
| Geneva.  |          |   | order to protect workers from the harmful effects of these substances.  |
| London Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, London.                                      |          | 18.03.94 (AC)<br>16.06.94 (entry into force)          | To strengthen the control procedure and extend the coverage of Montreal Protocol to new substances.   |
| Preparedness, Response and Cooperation (London, 1990.)<br>30.11.90 United Nations Framework Convention on Climate Change, New York | 09.06.92 | 15.04.94  | Achieving stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.              |
| Convention on Biological Diversity, Rio De Janeiro   | 05.06.92 | 03.05.94  | Conservation of biological diversity (or biodiversity) and sustainable use of its components.   |
| Agenda 21, UNCED, Rio de Janeiro   | 1992     | Signed  | Ensuring sustainable development.   |
| Copenhagen Amendment to the Montreal protocol on Substances that Deplete the Ozone Layer, Copenhagen, 1992                         | 1992     | 27.11.2000 (AT)<br>26.2.2001 (Entry into force)       | Extending the coverage of Montreal Protocol to new substances   |
| Montreal Amendment of the Montreal Protocol on Substances that Deplete the Ozone Layer, Montreal                                   |          | 27.7.2001 (Accepted)<br>26.10.2001 (Entry into force) | Controls in the trade of ozone depleting substances and the use of licensing procedures to control the import and export of new, recycled and reclaimed ozone depleting substances. |

## E. Legislation relating to Health and Safety during Construction

41. The legislations on Occupational Health and Safety (OHS) have provisions relating to the workers' safety, health and hygiene, occupational diseases, industrial accidents, protection of women and young persons in dangerous occupations, and also cover conditions of work, working hours, welfare facilities, holidays, leave, etc. The main legislations regarding the OHS during Construction stage of the project are;

42. The Factories Act, 1965 (Act XXV of 1934) and the Factories Rules 1979: is generally applicable to any factory 'means any premises including the precincts thereof whereon 10 or more workers are working or were working on any day of the preceding twelve months and in any part of which a manufacturing process is being carried on with or without the aid of power, but does not include amine'. The Workmen's Compensation Act 1923 as amended in 1980 and 1983, Employment of Children Act 1938,

43. The Bangladesh Labor Act, 2006: This is adopted by the Parliament replaced earlier legislation, including the Factories Act, 1965 and the Factories Rules, 1979, which had established a framework for safeguarding workers' rights and decent conditions of work in industrial establishments. The new Act codified 25 labor laws and reaffirmed the rights of workers to:

- Proper wages and benefits that ensure an adequate standard of living for workers and their families;
- Equal pay for equal work and non-discrimination;
- Regulated time of work and prohibition on forced labor or slavery;
- Safe, secure and healthy working environment;
- Fair compensation in cases of work-related death or injury;
- Right to organize trade unions for collective bargaining;
- Freedom of children from exploitation;

- Proper sanitation facilities, dinking facilities, maternity leave, childcare facilities and human resource development.

44. The Department of Inspection for Factories and Establishments under the Ministry of Labor and Employment administers and enforces the Labor laws, Factories Act and Factory Rules.

## F. Environmental Categorization and Standards

### a. Environmental Category: GOB

45. For the purpose of issuance of Environmental Clearance Certificate, the industrial units and projects shall, in consideration of their site and impact on the environment, be classified into the following four categories: (a) Green; (b) Orange- A; (c) Orange- B; and (d) Red. The Industries and projects included in the various categories are specified in sub-rule (1) have been described in Schedule-1. The ECA indicates that all industrial units or projects must obtain a Location Clearance Certificate (LCC) and Environmental Clearance Certificate (ECC) from the Department of Environment (DoE). No industrial unit or project shall be established or undertaken without obtaining environmental clearance from DoE in the manner prescribed by the rules.

46. The environmental category of the project is not listed in Schedule-1 of ECR. However, the construction of National road improvement project is listed in Schedule-1 of ECR and falls in Red. Table II.3 describes DoE classification for road project.

**Table II-3: Likely GoB Classification of road sector projects including bridge construction**

| Project       | Component   | Equivalent in Schedule I of ECR   | DoE Classification |
|---------------|---|---|--------------------|
| Road & Bridge | Road provisions (include Road & drain Rehabilitation/ Improvement/ Construction, road resurfacing, road signs, intersection, Foot over bridge, Bridge, SMVT etc.) | <b>Red item #67;</b><br>(Construction/reconstruction/expansion of regional, national & international Roads)<br><b>Red item #68;</b><br>(Construction/reconstruction/extension of bridges longer than 100meters) | <b>Red</b>         |
|               |   | <b>Orange Item 63:</b><br>Construction/reconstruction/extension of feeder roads and local streets; and<br><b>Orange Item 64:</b><br>Construction/reconstruction/extension of bridges less than 100 meters long. | <b>Orange-B</b>    |

### b. Environmental Category: AIIB

47. The ESP and ESS of AIIB provides guidance on the environment category of projects based on the degree of anticipated environmental impacts. AIIB environmental and social safeguards objectives are: (i) to ensure the environmental and social soundness and sustainability of project and (ii) to support the integration of environmental and social considerations into the project decision-making process. AIIB environmental and social safeguards are triggered if a project is likely to have potential environmental and social risks and impacts. The initial process of categorization involves filling out a sectoral Rapid Environmental Assessment (REA) checklist. A project is classified as one of the four environmental categories (A, B, C, or FI) based on the most environmentally sensitive component. Categories are as follows:

**a. Category A:** A Project is categorized “A” if it is likely to have significant adverse environmental and social impacts that are irreversible, cumulative, diverse or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works and may be temporary or permanent in nature. The Bank requires the Client to conduct an environmental and social impact assessment (ESIA) or equivalent assessment for each Category A Project, and to prepare an ESMP or ESMPF, which is included in the ESIA report for the Project. The ESIA for a Category A project examines the Project’s potential environmental and social impacts, both positive

and adverse, compares them with those of feasible alternatives (including the “without Project” situation), and recommends any measures needed to avoid, minimize, mitigate, or compensate for adverse impacts and improve environmental and social performance of the Project.

**b. Category B:** A Project is categorized B when it has a limited number of potentially adverse environmental and social impacts; the impacts are not unprecedented; few if any of them are irreversible or cumulative; they are limited to the Project area; and can be successfully managed using good practice in an operational setting. The Bank requires the Client to conduct an initial review of the environmental and social implications of the Project. On the basis of this review, the Bank, in consultation with the Client, determines the appropriate instrument for the Client to assess the Project’s environmental and social risks and impacts, on a case-by-case basis. The Bank may determine that an environmental and social assessment or another similar instrument is appropriate for the Project. The scope of the assessment may vary from Project to Project, but it is narrower than that of the Category A ESIA. As in the case of a Category A Project, the assessment examines the Project’s potentially negative and positive environmental and social impacts and recommends any measures needed to avoid, minimize, mitigate, or compensate for adverse impacts and improve environmental and social performance of the Project.

**c. Category C:** A Project is categorized C when it is likely to have minimal or no adverse environmental and social impacts. The Bank does not require an environmental and social assessment but does require the Client to conduct a review of the environmental and social implications of the Project.

**d. Category FI:** A Project is categorized FI if the financing structure involves the provision of funds to or through a financial intermediary (FI) for the Project, whereby the Bank delegates to the FI the decision-making on the use of the Bank funds, including the selection, appraisal, approval and monitoring of Bank-financed project. The Bank requires the FI Client, through the implementation of appropriate environmental and social policies and procedures, to screen and categorize project as Category A, B or C; review; conduct due diligence on; and monitor the environmental and social risks and impacts associated with the Bank financed project, all in a manner consistent with this ESP. A Project categorized as FI is also subject to: (a) the Environmental and Social Exclusion List and applicable host country national laws for all Bank-financed project; and (b) the applicable ESSs for the Bank-financed project that are classified as Category A projects (and if the Bank so determines, some or all of the Bank-financed projects that are classified as Category B projects).

48. Therefore, the Sylhet-Tamabil Road will be “Category A” under the AIBB categorization, since it was anticipated that there would be significantly adverse impacts related to resettlement during construction of existing 2-lane road into 4-lane highways.

## G. Institutional Arrangements/Framework

49. The Environmental and Social Management Plan (ESMP) implementation requires an organization support structure in the form of organizational requirements, training needs and plan, and information management system. The following section captures these institutional arrangements for ESMP implementation by concerned officials of RHD, their consultants and working contractors.

50. The organizational structure of RHD is given in Figure II-2. However, an organizational structure shall be developed at the corporate, regional and site level to aid effective implementation of the ESMP document. Various departments will be involved during implementation of the project. Contractor is responsible for implementation of ESMP during works and Construction Supervision Consultant (CSC) is primarily responsible for supervision of monitoring of the implementation of the ESMP. RHD will be supported by a Management Consultant (MC) to advise and assist RHD in quality and capacity enhancement and independent quality monitoring. Contractor will be responsible for

implementation of ESMP during work activities stage. Relevant departments responsible for implementation and supervision of proposed mitigation and monitoring measures are given in the ESMP.

51. CSC will be responsible to monitor all activities of all contractors procured under the project. As several contractors will be working simultaneously for timely and speedy implementation of the project, it is important that CSC has an environmental unit to effectively supervise and monitor the environmental activities being implemented in the field. The CSC is also responsible to update or make necessary changes to the ESMP if required based on the revised designs and locations

52. A combined grievance redress committee is proposed to address grievances in both social and environmental issues. In addition, there will be NGOs working for plantation program and environmental awareness.

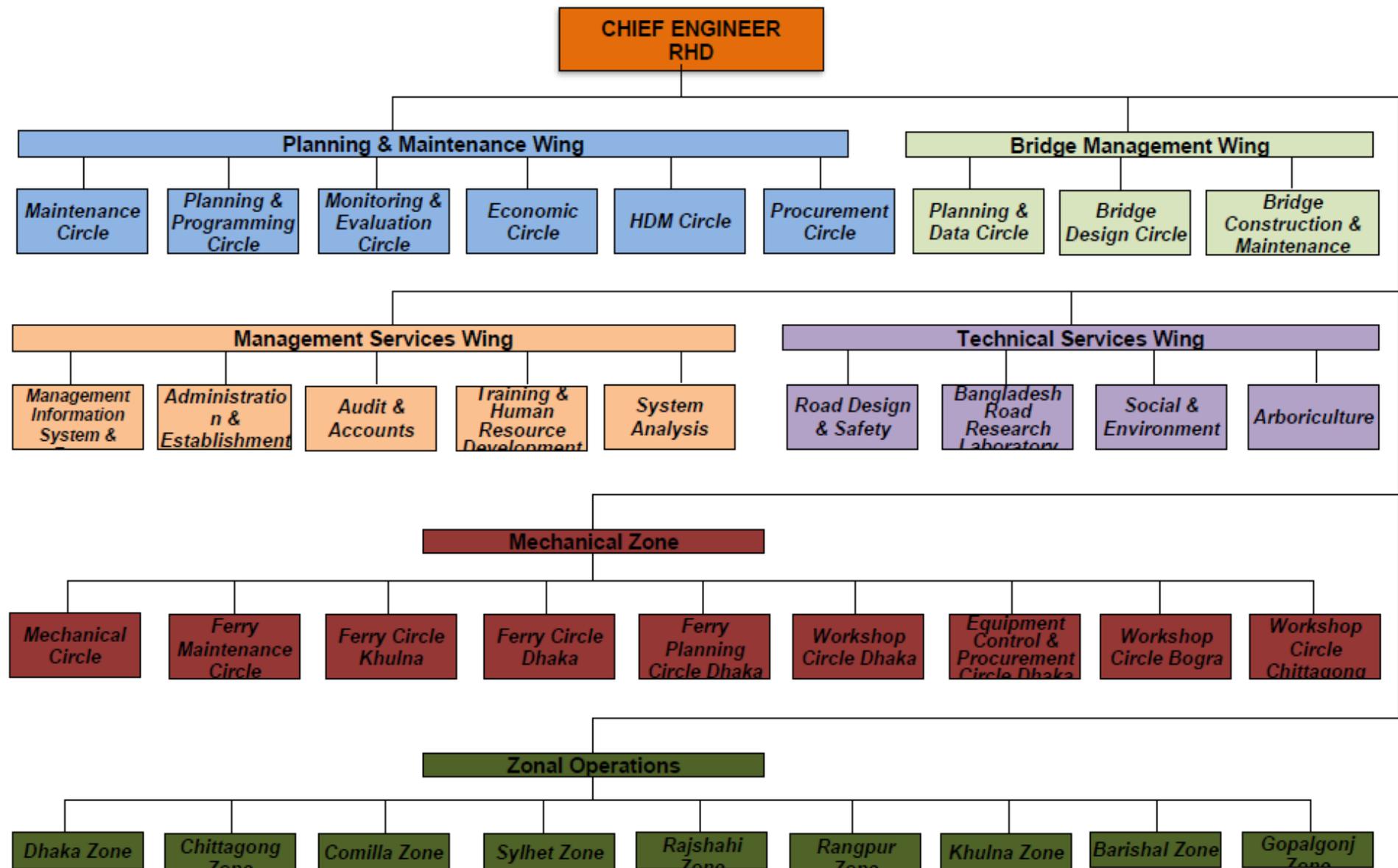


Figure II-2: Organisation Structure of RHD

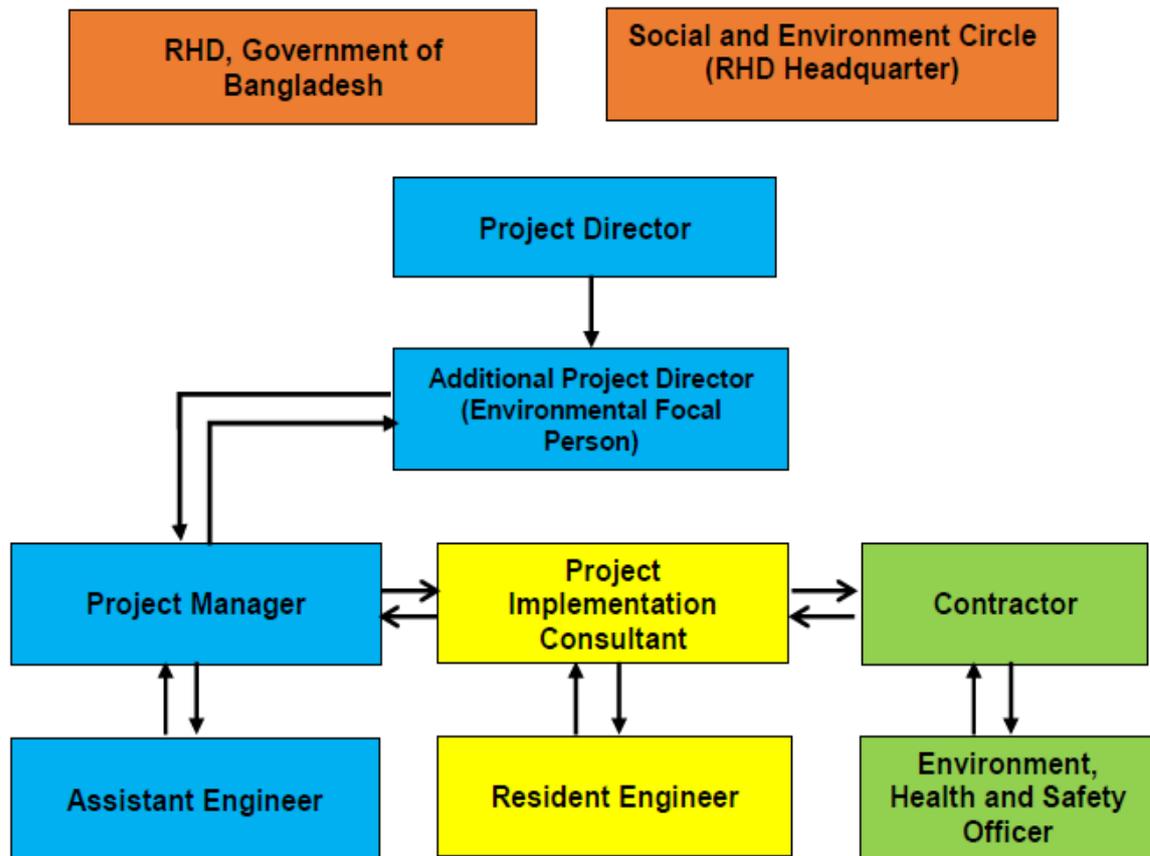


Figure II-3: Proposed Organisational Structure for EMP Implementation of RHD for Sylhet-Tamabil Road Project

## H. Institutional Roles and Responsibilities

53. The Roads and Highways Department (RHD) is the Executing Agency (EA) for the RHD and will be responsible for ensuring that all the components of the ESF are complied with. The RHD has the responsibility to ensure that the investment follows the legal requirements for environmental assessment. The RHD has an Environmental and Social Circle (ESC) headed by the Superintending Engineer who is supported by the Executive Engineer, Subdivision Engineer, Assistant Engineer and Sub-assistant Engineer.

54. The APDs serve as the environmental focal persons under each PIU. One of Assistant Engineers serves as the environmental focal person at the site level and support the respective APD on environment safeguard matters. Further the Project Implementation Consultant (PIC) responsible for supervising the civil works contractor will provide support to the respective PIU for day to day monitoring and reporting on environment safeguards.

55. The following elaborates the detailed responsibilities on environment safeguards:

### a. RHD

56. As the EA for the investment program, RHD will be responsible for ensuring that all the environment safeguard requirements as provided in the Framework Financing Agreement (FFA), this ESF and the respective ESIA and ESMP are complied with.

### b. RHD (Environment and Social Circle)

57. The RHD Environment and Social Circle (ESC) is responsible for managing environment and social safeguards including safeguards related capacity building for all RHD projects. They will not be involved in the day to day implementation of safeguards for specific projects such as this investment program. The respective PIU will seek their support and advise on an as needed basis. Their overall responsibilities are:

- Ensure that all RHD works and projects are executed in accordance with appropriate environmental and social standards and practices.
- Liaise with GOB organisations and other line agencies to ensure effective interagency cooperation on relevant projects.
- Ensure the provision or procurement of the necessary services for carrying out Environmental Assessment, Land acquisition and Resettlement studies.
- Disseminate the need for high social and environmental standards throughout RHD and to the concerned public through research, publicity, seminars and training.
- Coordination the preparation and implementation of environmental and RAPs for RHD projects as needed.
- Monitor long-term, cumulative environmental impacts and ensure mitigation measures for project sustainability.
- Conduct site inspections on selected RHD projects as needed
- Provide feedback on all environmental issues of existing and ongoing RHD projects and works.
- Review and preparation of Request for Proposal (RFP) and tender documents for procurement of Environmental Services (ESIA and ESMP) for RHD projects.
- Assist the Director of RHD Training Centre in providing training to RHD officers in Environmental and Resettlement issues.
- Review and approve the Environmental Assessment reports and Environmental Monitoring reports produced by consultants/experts under RHD projects as needed.
- Establish and maintain environmental standards, guidelines and manuals in RHD.
- Identify environmental issues and constraints at project planning stage, suggest alternatives, options.
- Establish a reference library, containing relevant environmental documents (hard and soft copies) of domestic and overseas sources.
- Monitor long term environmental impacts on relevant RHD Projects
- Liaise with Road Safety Circle, Arboriculture Head and maintain intra-departmental co-ordination

**c. PIU (Environmental Focal Persons at Project Head Quarter and Site level)**

58. The Additional Project Directors under the respective PIU will serve as the Environmental Focal Person at the Project Head Quarter level. At the site level an Assistant Engineer supporting the Project Manager will serve as the environmental focal person. The PIU will be responsible for ensuring proper implementation of environment safeguards in their respective projects including implementation of the ESMP, timely reporting, and timely resolution of complaints and grievances. Their detailed responsibilities are:

- Prepare or engage consultants to prepare environmental assessment reports (ESIA, ESMP) for project components as necessary
- Review and comment on the environmental assessment reports and environmental monitoring reports prepared by consultants and ensure they are prepared in accordance with requirements of RHD, DOE and AIIB
- Ensure that the consultants while carrying out work at site follow the environmental standards, guidelines and manual of RHD.
- Take necessary steps to ensure timely receipt of DoE Environmental Clearance
- Ensure that the ESMP and relevant environmental clauses are included in the contractors bidding documents
- Conduct spot checks on-site to monitor contractor's compliance with the ESMP
- Review and endorse quarterly monitoring reports prepared by the PIC
- Review and endorse annual environmental monitoring reports prepared by the PIC for further submission to AIIB for disclosure on the AIIB website
- If there are any non-compliance issues or unanticipated environmental impacts ensure that necessary corrective actions are taken and ESIA and/or ESMP is updated as necessary
- Ensure that all grievances and complaints received are addressed in a timely manner and properly documented

- Carry out all other activities on environment safeguards on behalf of the PIU as needed

**d. Project Implementation Consultant (Environment Safeguards Team)**

59. The proposed framework for implementation of the project shall utilize consultancy services from both international and national companies for the overall management and supervision of construction work on behalf of the EA. In addition to supervising the construction work of the contractor their role will be to check on conformity with the relevant clauses in construction contracts and national legislation and regulations. The following are the detailed responsibilities of the PIC

- Review the ESIA and ESMPs of respective subprojects to understand the context and environmental issues of the project
- Establish monitoring and reporting protocols within the environment safeguards team at the site level and project headquarter level
- Require the civil works contractor to prepare sub-plans on environment safeguards such as camp layout plan, borrow area management plan, construction debris management plan, traffic management plan etc. as needed
- Review and approve all sub-plans on environment safeguards submitted by the civil works contractor
- Conduct regular (minimum of weekly) onsite inspections on implementation of the ESMP by the contractor
- Ensure the contractor obtains all clearances, permits etc. related to environment safeguards on a timely basis
- Ensure the contract collects required environmental monitoring data (air, water, noise) as stipulated in the respective ESIA report
- Provide on-site technical advice and training to the contractor as needed
- Organize training workshops on implementation of environment safeguards for the project team including PIU, RHD site offices, members of the PIC and civil works contractor
- Facilitate proper functioning of the GRM and maintain records of all complaints received and actions taken for inclusion in the environmental monitoring reports
- If there are any non-compliance issues or unanticipated environmental impacts ensure that necessary corrective actions are taken and update the ESIA and/or ESMP as necessary
- Review and approve the monthly progress reports submitted by the contractor
- Based on monthly progress reports submitted by the contractor and site inspections prepare quarterly environmental monitoring reports for review and approval by the PIU
- Based on the quarterly monitoring reports prepare annual environmental monitoring reports for review and approval by the PIU and further submission to AIIB for disclosure on the AIIB website
- Provide necessary technical support to the PIU on implementation of environment safeguards

**e. Contractor (Environment Safeguards Team)**

60. The tender for the construction of the project would be national/international competitive bidding contractors. The Contractor is legally mandated to implement the ESMP and obtain all environments related permits and clearances required for construction. The detailed responsibilities of the contractor on environment safeguards are the following:

- Recruit and appoint environmental focal persons and/or environmental health and safety officers on the construction site
- The contractor shall comply with all statutes and regulations concerning the execution of works as mentioned in DoE and RHD environmental guidelines.
- The contractor shall be responsible for familiarizing himself with all legislation relating to environmental protection that is relevant to his activities. Reference to rational environmental quality guidelines should be made.

- Implement the ESMP approved by the PIC
- Prepare all sub-plans related environment safeguards such as camp layout plan, borrow area management plan, construction debris management plan, traffic management plan etc. as needed and submit for approval by the PIC
- Obtain all statutory clearances and permits on environment safeguards in a timely manner
- Conduct environmental quality monitoring (air, noise, water) as stipulated in the Environmental Monitoring Plan of the respective ESIA report
- Take necessary measures to immediately address any complaints or grievances raised by local community or other stakeholders
- Prepare monthly progress reports on implementation of the ESMP for approval by the PIC
- The contractor shall be responsible for the costs of cleaning up any environmental pollution resulting from his activities if methods for doing so are available and effective.

**f. AIIB**

61. As a funding agency AIIB is responsible for monitoring implementation of environment safeguards, providing technical guidance to the EA as necessary. Specific responsibilities entail the following:

- Review ESIA reports, including ESMP, provide feedback, and disclose the reports on the AIIB website as required by the AIIB Policy;
- Provide assistance to RHD, if required, in carrying out its responsibilities and for building capacity for safeguard compliance;
- Monitor overall compliance of the RHD tranches and components to respective ESIA and ESMP through review missions;
- Review all environmental and social monitoring reports submitted by RHD, provide feedback and disclose the reports on the AIIB website as required by the AIIB Policy.
- Provide guidance to the RHD and the PIU on issues related to inclusion of new component components, changes in component design, occurrence of unanticipated environmental and social impacts during component implementation, emergency situations and others as necessary.

**I. Capacity Building**

62. In Bangladesh, the environmental assessment process is established, but environmental awareness and capability for implementation of ESMP in infrastructure projects are still developing. The project implementation unit (PIU) of RHD had some officers in the Environment and Social Circle Department (ESC) that are delegated environmental duties. The delegated officers have responsibility to bring environmental issues to the notice of senior management. Typically, the delegated officers have been moved to different departments due to promotions and operational needs after about every 3 years, and they move on to other engineering departments in RHD. The status quo is that ESC engineering officers are delegated to check environmental assessments prepared by consultants. The EIA and ESMP are referred to the DOE in the Ministry of Environment and Forests (MOEF) for approval. The ESC in RHD is not directly involved with project implementation but has more administrative responsibility to ensure environmental compliance and a general role to increase environmental awareness for RHD. It is therefore not clear if RHD/ESC has the capacity to check the adequacy of the developed ESMP for this project.

63. The most significant challenge for environmental management on this project is the lack of human and financial resources and necessary infrastructure in PIU. To enhance the capacity of the RHD Environmental and Social Circle and PIU for effective implementation of proposed mitigation measures and monitoring the resultant effect, some training programs and awareness workshop are proposed. The detailed training plan is provided at Table II-4.

Table II-4: Training Plan

| Target Group  | Subject(s)  | Method                             | Time Frame  |
|---|---|------------------------------------|---|
| <b>Planning and Construction Stage</b>  |   |                                    |   |
| All concerned PIU/RHD project staff   | <b>Environmental Overview:</b><br>Environmental regulations, and national standards, process of impact assessment and identification of mitigation measures, importance of ESMP & monitoring, and monitoring methodology  | Lectures                           | Before beginning of the implementation of the project |
| Environmental engineers, field officers, contractors, supervision consultants | <b>Implementation of ESMPs:</b><br>Basic features of an ESMP, planning, designing and execution of environmental mitigation and enhancement measures, monitoring and evaluation of environmental conditions – during construction and operation   | Workshops and Seminars             | Before the construction begins                        |
| Environmental Engineers, field officers, contractors, supervision consultants | <b>Environmentally Sound Construction Practices:</b><br>Waste management and minimization in construction, pollution control devices and methods for construction sites and equipment, Environmental clauses in contract documents and their implications, Environmental monitoring during construction   | Seminars, Lectures and Site visits | Before the construction                               |
| Project staff dealing in social/lands matters                                 | <b>Social awareness:</b><br>Monitoring consultants/organizations specializing in social management and monitoring can provide training on social awareness and land acquisition and resettlement issues   | Lectures, Workshops and Seminars   | Before the construction begins                        |
| Environmental engineers, field officers, contractors, supervision consultants | <b>Monitoring Environmental Performance during Construction:</b> Monitoring, Air, Water, Soil Erosion, Noise, and effect on wild life and fisheries, Evaluation and Review of results, Performance indicators and their applicability, possible corrective actions, reporting requirements and mechanisms | Lectures, Workshop and site visits | During initial phases of construction                 |

64. It would be essential to understand the legislative framework and enhance capacity of Environmental and Social Unit of RHD and Field Officer (Environment) for analyzing the applicability of various environmental legislations and clearances, approvals and compliance monitoring requirements.

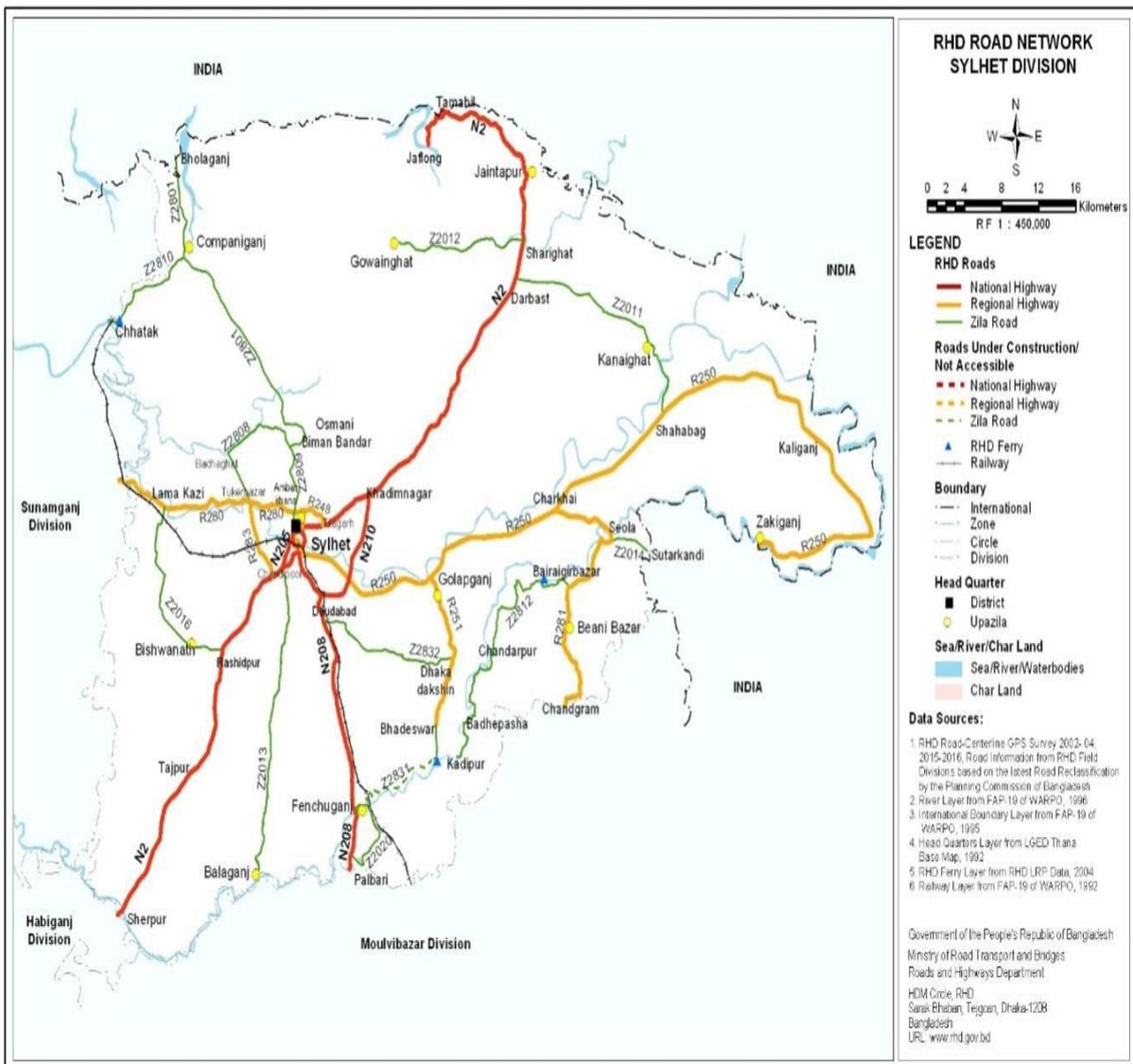
### **III. DESCRIPTION OF THE PROJECT**

#### **A. The Study Area**

65. The Sylhet-Tamabil national highway starts from the Sylhet City of which Lat. 24°53' 91" and Long. 91°52' 43". The total length of the road is about 60 km. The GPS at the end of the Project road close to the Tamabil border is Lat 26°46' 41" and Long 92°03' 27". The Project road passes through Sylhet district only which is located Sylhet division. The location map of the project road is presented in Figure III-1. This is an important arterial road for the north east of the country. The N2 road links Dhaka, the administrative capital of Bangladesh, with Sylhet, the principal city and administrative capital of Sylhet Division and, slightly further towards the north-west, with Tamabil on the northern border with India. The N2 road passes through the urban centers of Bhairab Bazar, Jagadishpur and Shaistagonj before reaching Sylhet, which is the fifth largest city in Bangladesh, with a population of more than 500,000. Bhairab Bazar is in the Upazila of Kishoreganj District in the Division of Dhaka. It has a railway station, a railway bridge crossing the Meghna River and a road bridge crossing the same river, which is one of the three rivers which form the Ganges Delta (the largest Delta in the world). Shaistagonj is in the Upazila of Habiganj District.

#### **B. The Project Cost**

66. Construction cost, PBM cost and Other Element cost constitute the per km cost which amounts to US\$ 6.0 million. This cost includes the cost of land acquisition and resettlement as well as construction supervision cost.



Printed and Published by HDM Circle, RHD

**Figure III-1: Location Map of Sylhet-Tamabil Road**

**a. Road, Bridge, Culvert Components**

**1. Existing Condition and Need for the Project**

67. The Project road passes through mostly low flat agricultural land, which is subject to seasonal flooding. It also passes through a few undulating hilly areas, especially in Jaintapur Upazila and close to Tamabil. Traffic volumes on the Bangladesh road networks, including the Dhaka-(Katchpur)-Sylhet-Road, are high and exceed safe capacity levels. However, traffic volumes are moderate on Sylhet-Tamabil road which connects the Tamabil Land Port and Meghalaya in India. RHD have therefore commissioned the feasibility of improving the present road from the existing 2-lane to 4-lane road to accommodate the present and potential growth in traffic flows in the future.

68. Specifically, the improvement of the Dhaka-(Katchpur)-Sylhet-Tamabil highway will promote inter regional trade, commerce and industry and tourism in the region including Narayanganj, Narsingdi, Kishoreganj, Brahmanbaria, Kishoreganj and other districts, and will foster the international export-import trade between Bangladesh and India by Tamabil Land Port through high quality international highway communication.



Road side trees, Haor's and pond at the project road



RHD road with very badly damaged surface and displaying poor maintenance

69. The existing traffic along the project road consists of mixed traffic and contains a high proportion of slow-moving vehicular traffic (SMVT). For achieving the optimum speed by fast moving vehicular traffic (FMVT) and increasing its carriageway capacity, and for SMVT safety, slow moving vehicular traffic is separated from the carriageway assigned for FMVT. Separate SMVT lanes are located on both sides of the road except in some sections which have major physical interruption. In these sections, wider SMVT lanes are provided on only one side. To provide further safety to SMVT, lanes have grade separation from the FMVT carriageway.

70. Under Government of Bangladesh DoE requirements all proposed bridges over 100 m in length are required to be covered by an IEE/EIA. On the project road, the total numbers of bridges and culverts are 85, of which 20 are large to medium type bridges and 66 are culverts. No separate EIA is required & no separate ECC is required for the bridges.

**Table III-1: Existing Structure for Sylhet-Tamabil Road**

| Sl no. | Name of Road   | Category | Road   | PC Bridge | Box Culvert | RCC Bridge | TRS Bridge |
|--------|----------------|----------|--------|-----------|-------------|------------|------------|
| 1      | Sylhet-Tamabil | N2       | 56.2km | 1         | 66          | 12         | 7          |

71. At medium Bazaars, pedestrian crossings have been provided at grade, and for large bazaars, foot over bridges have also been proposed. A list of proposed foot over bridges and bypasses is presented in Table III-2 above and the list of markets with type of improvements is presented in Appendix 3.



Figure III-2: Existing Status of Proposed road

72. River waterways in Bangladesh are used extensively for transportation of goods and passengers, and for fishing activities; both for commercial and for subsistence purposes. Initial investigation shows that all rivers at the bridge locations are used for both transport and fishing activities. It is essential therefore that the design ensures that river traffic is not adversely impacted by the bridge and that the abutments and bridge piers do not impact on fish movements and fishing activities.



Figure III-3: Existing Condition of Shahparan Bridge



Figure III-4: Existing Condition of Sari Bridge



**Figure III-5: Existing Condition of Boro Gung River Bridge**

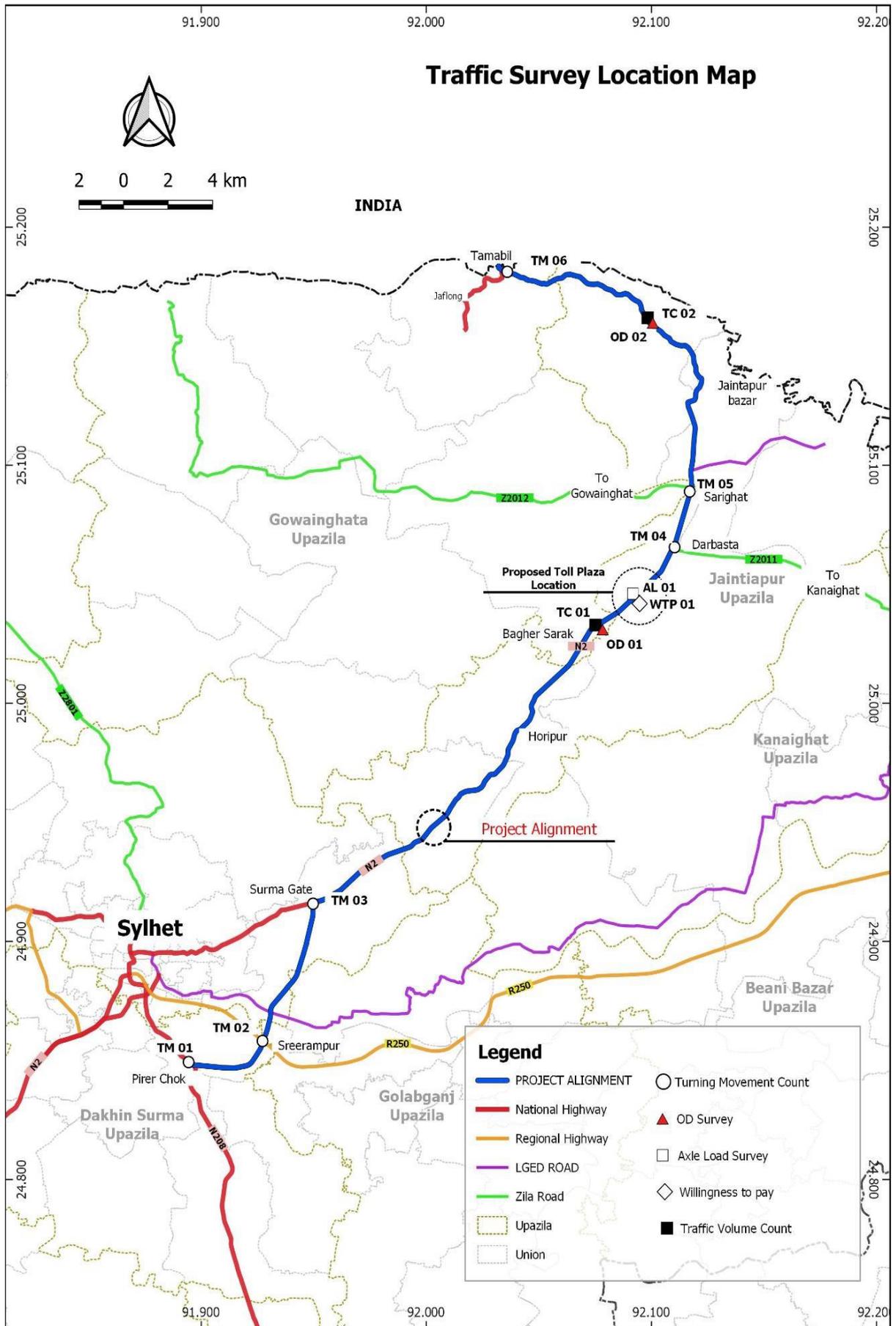


Figure III-6: Location of the Proposed Road

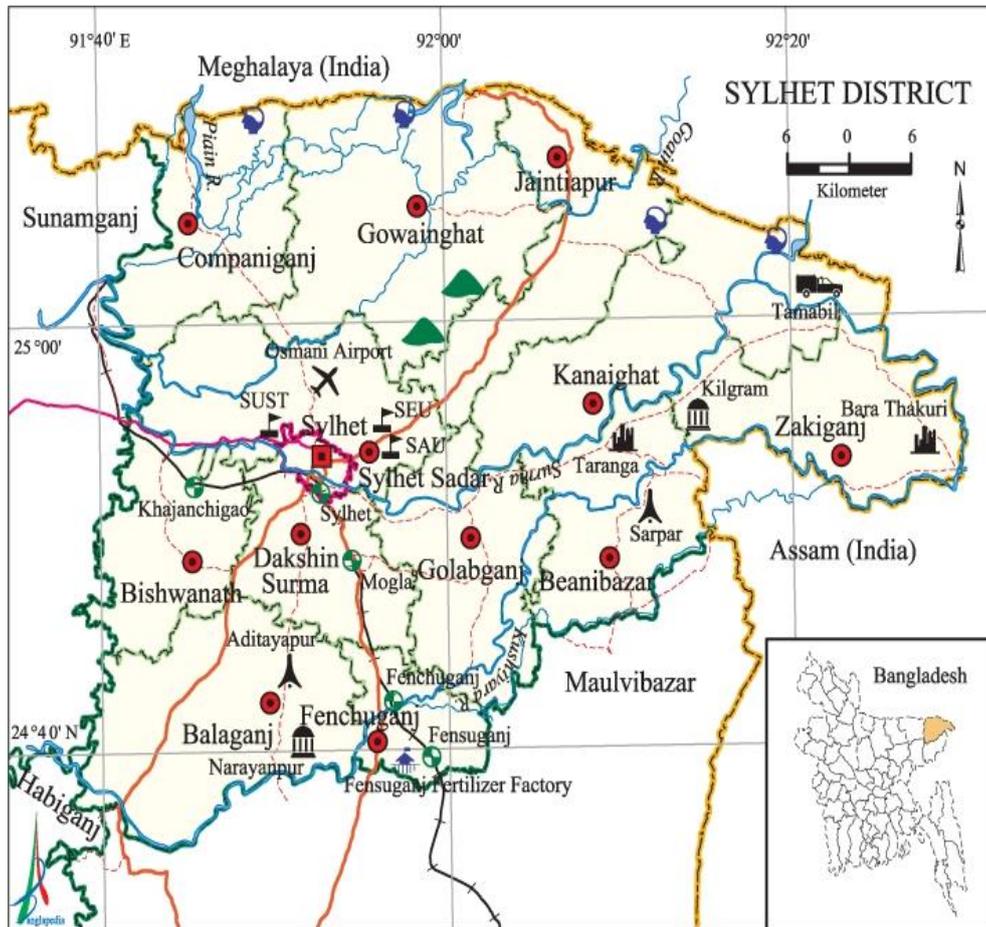


Figure III-7: Sylhet District Map

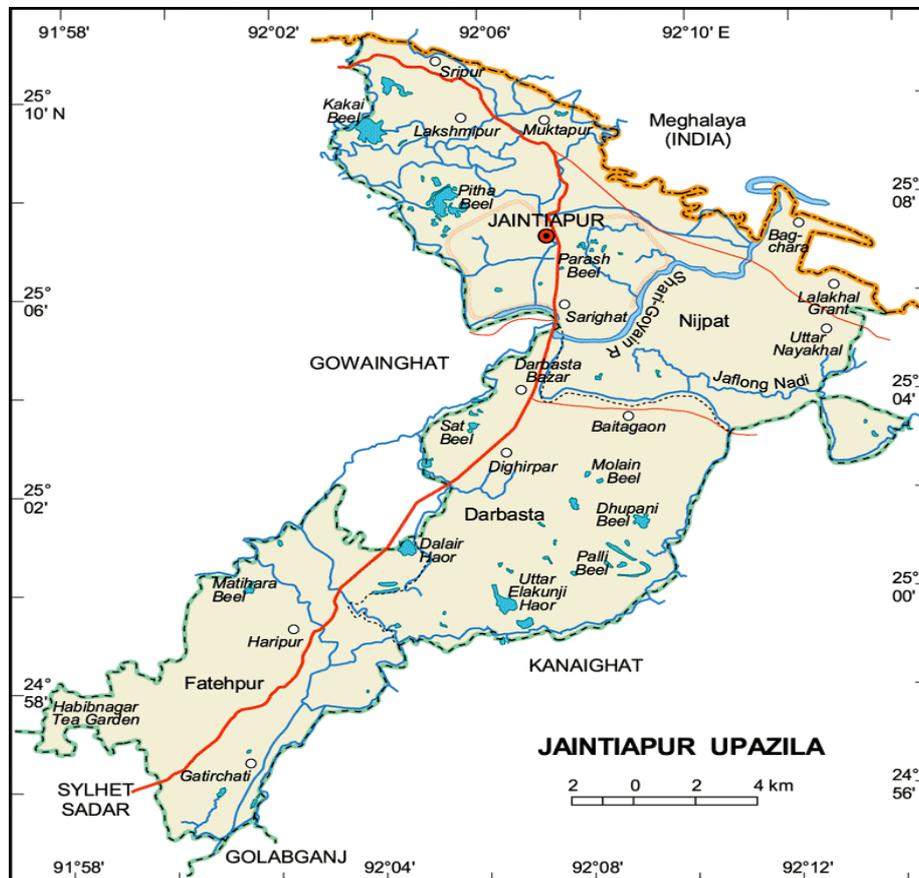


Figure III-8: Jaintiapur Upazila Map

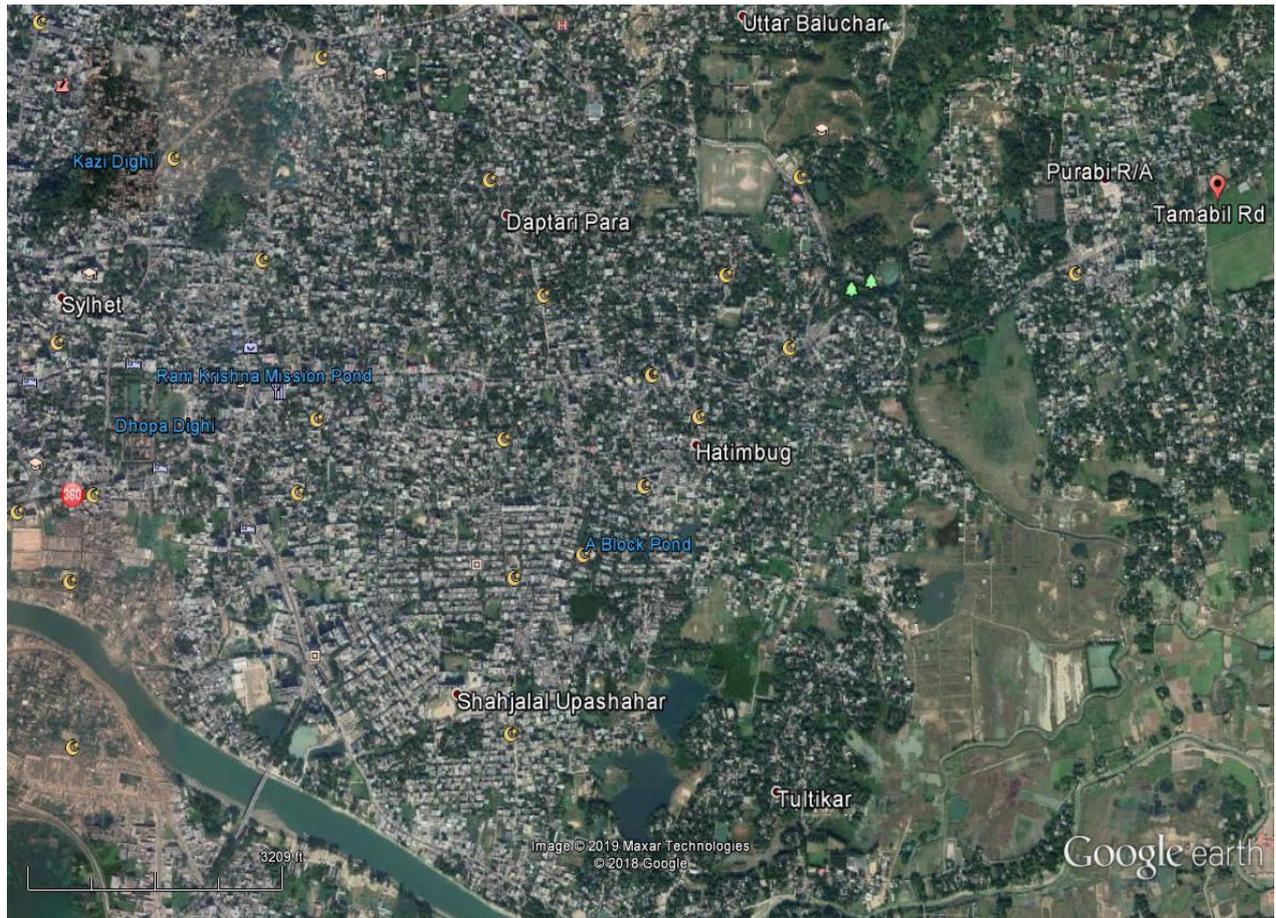


Figure III-9: Sylhet District in Google Map

## 2. Proposed project

73. RHD have therefore commissioned the feasibility of improving the present road from the existing 2-lane to 4-lane road to accommodate the present and potential growth in traffic flows in future. Traffic volumes are moderate on Sylhet-Tamabil road which connects the Tamabil Land Port and Meghalaya in India.

74. Typical cross sections have been developed for the market area with wider service lane, road side drain and SMVT. In most of the cases, the existing RoW at the market area is not adequate to accommodate this section. This section is proposed for the small market where the land acquisition and resettlement cost will be low. At the large market where the widening will be difficult and costly, foot over bridge has been proposed to eliminate traffic congestion and for improvement of safety. In long densely built up areas where the existing alignment is winding with sub-standard curves & neither existing alignment improvement nor the foot over bridge is feasible technically and or economically, bypass has been proposed. Jaintapur are such built up areas. The consultant had proposed a single Bypass for bypassing for Jaintapur in their draft design. As mentioned earlier in as per decision of RHD, Jaintapur Bypass proposal has been amended to follow the existing alignment as much as possible with improvement of sub-standard curve at Jaintapur and improvement of existing roundabout at Jaintapur in the final design for field visit.

75. The alignment up to Jaintapur is reasonably straight except some sharp bends at a few places. From km 272.3 to 276.5, the road passes through Jaintapur, a built-up area. At this section, the alignment is winding with several sharp bends and heavily encroached by both residential and commercial buildings. Widening of the road will be difficult and prohibitively expensive. From Jaintapur to Tamabil, the existing alignment is winding, following natural hilly or valley topography.

Table III-2: Proposed components for Sylhet-Tamabil Road

|                  |   |
|------------------|---|
| Length           | 56.2 Km   |
| Alignment        | Follow the existing road alignment including the bypass area Jaintapur for road widening and improvement. |
| Box Culvert      | 52  |
| PSC Bridge       | 31  |
| RCC Bridge       | 3   |
| Foot over Bridge | 11  |

76. Typical adopted cross sections of the road are produced in Figure below

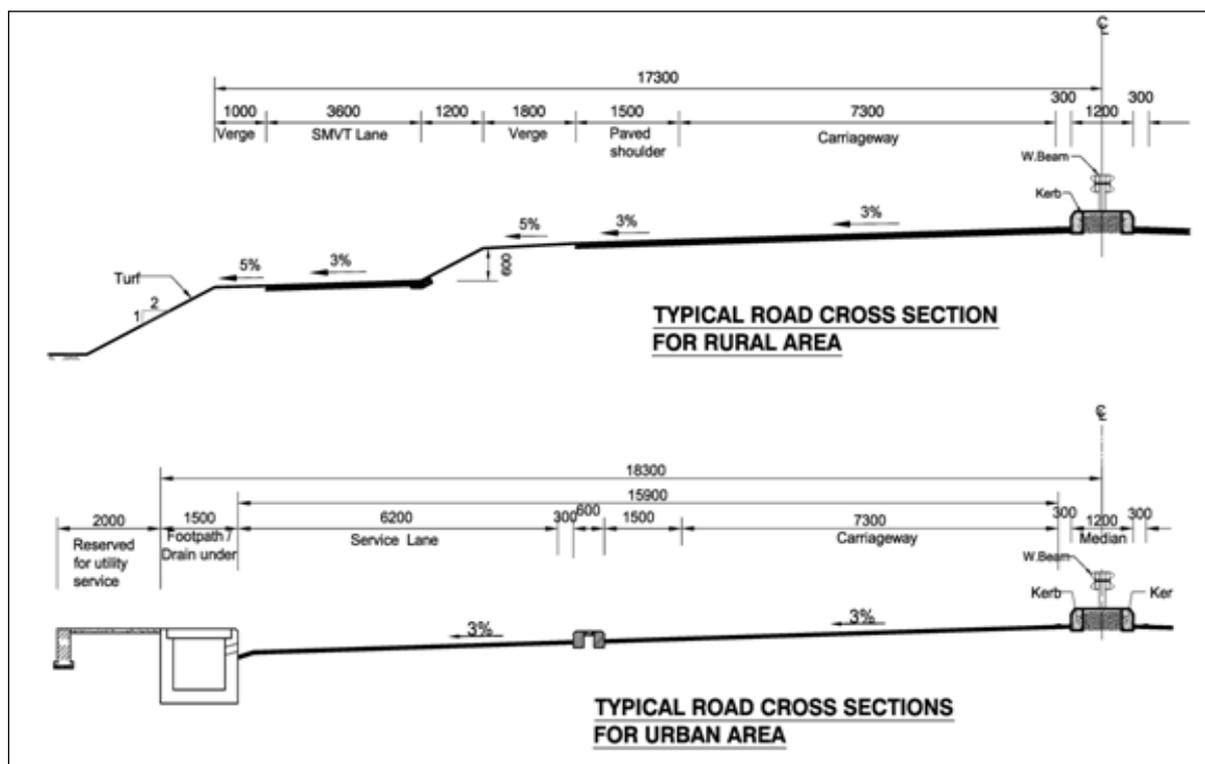
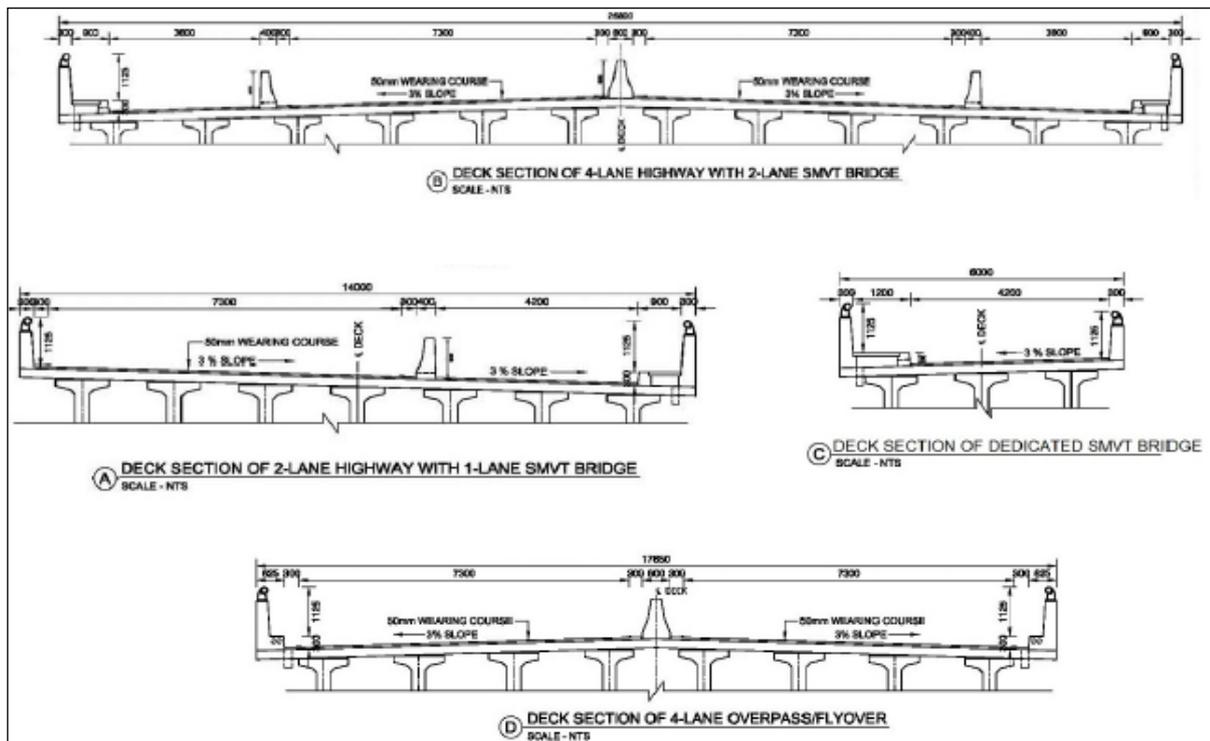


Figure III-10: Typical Road Cross-section for Rural and Urban area

77. Configurations of new bridge roadway have been determined on the following principle. The (4-lane highway + 2SMVT lanes) configuration applies for river crossings where it is not possible to use an existing structure. The (2-lane highway + 1SMVT) configuration applies where an existing bridge is retained to carry one highway carriageway. The SMVT-only configuration bridge is used where an existing bridge is retained and where the new SMVT bridge is 3 spans or less. The SMVT-only Bridge is located on the opposite side of the existing bridge from the new 2-lane highway + 1SMVT Bridge. The 4-lane highway bridge configuration applies for elevated roadway or overpasses.

78. The cross-section configurations for the different bridge requirements referred to above are shown in the figures below:



Top: 4-Lane Highway + 2SMVT; Centre Left: 2-Lane Highway + 1SMVT; Centre Right: SMVT-only;  
Bottom: 4-Lane Highway

**Figure III-11: New Bridge Roadway Configurations**

### 3. Highway Design Concept

79. Highway design is one of the most important tasks of detailed engineering design. Principally RHD Geometric Design Standards Manual (Revised) 2005 has been followed for geometric design. Additionally, the following reference recommendations and standards have been consulted for reference:

- AASHTO "A policy on Geometric Design of Highway and Streets" 2001
- Asian Highway Classification and Design Standards, UN ESCAP
- Overseas Road Note 6 "A Guide to Geometric Design" published by TRRL 1988

80. Summary of geometric design criteria adopted for the project road is presented in the table below:

**Table III-3: Design standards for Sylhet-Tamabil Road**

| Sl no.           | Design Criteria                 |  | Value |
|------------------|---------------------------------|--|-------|
| 1.               | Speed Control                   | Design Speed (Km/h)                        | 80    |
| 2.               | Stopping Controls               | Stopping Sight Distance (SSD) in meter     | 120   |
|                  |                                 | Intermediate Sight Distance (ISD) in meter | 250   |
| 3.               | Horizontal Controls             | Minimum Curve Radius (m)                   | 500   |
|                  |                                 | Maximum Super Elevation                    | 5%    |
|                  |                                 | Minimum Transition (m)                     | 55    |
| 4.               | Vertical Controls               | Maximum Gradients                          | 4%    |
|                  |                                 | Minimum K value                            | 70    |
|                  |                                 | Vertical Clearance (m)                     | 5.7   |
|                  |                                 | Vertical Clearance over Rail Track (m)     | 7.1   |
| 5.               | Cross Section Elements for FMVT | Carriage width for dual carriageway (m)    | 14.6  |
|                  |                                 | Carriage width for single carriageway(m)   | 7.3   |
|                  |                                 | Traffic lane width (m)                     | 3.65  |
|                  |                                 | Normal cross fall                          | 3%    |
|                  |                                 | Paved shoulder width (m)                   | 1.5   |
|                  |                                 | Verge (where there is no SMVT) in meter    | 1.0   |
|                  |                                 | Verge (where there is SMVT) in meter       | 1.8   |
| Verge cross fall | 5%                              |  |       |

|    |                                       |  |             |
|----|---------------------------------------|--|-------------|
|    |                                       | Inner marginal shoulder (m)            | 0.3         |
|    |                                       | Raised central median width (m)        | 1.2         |
|    |                                       | Embankment slope (Fill)                | 2H:1V       |
|    |                                       | Embankment slope (Cut)                 | 1H:2V       |
| 6. | Cross-Section<br>Elements for<br>SMVT | Carriageway width in meter (both side) | 3.6         |
|    |                                       | Carriageway width in meter (one side)  | 4.2         |
|    |                                       | Service Lane in market area (m)        | 6.2         |
|    |                                       | Carriageway cross fall                 | 3%          |
|    |                                       | Maximum Gradients                      | 3%          |
|    |                                       | Verge, (m)                             | 1.0         |
|    |                                       | Verge cross fall                       | 5%          |
|    |                                       | Step down                              | H=1.2,V=0.6 |
|    |                                       | Vertical clearance for underpass (m)   | 3           |

#### b. Implementation Schedule

81. The Detailed Design of this road is programmed to be completed in October 2019. Procurement of contractors can then commence. Construction work start date is tentatively May 15, 2020 and construction completion works is targeted for May 15, 2025.

## IV. DESCRIPTION OF THE ENVIRONMENT

82. The baseline environment of the study area along with environmental profile within the corridor of impact (COI) of the project roads are given in this section. The State of Sylhet is divided into the following broad regions for assessment of the baseline environment profile of the project districts as a whole and along the Corridor of Impact (COI) of the 56.16km road.

83. The regions of influence of the project vary depending on the specific environmental parameters, and an attempt is made to give the reader information appropriate to the subject. For example, the region of influence for site-specific topics such as soil, topography, surface water, noise, recreational resources and cultural resources is usually limited to the immediate vicinity of the roadways, and the description of environment is limited to that vicinity. For other issues, such as geology, climate, transportation patterns, population, land use changes and public health, the description of the environment covers a broader geographic extent.

### A. Baseline Environment

84. Upgrading the 2-Lane Sylhet-Tamabil (N2) highway road into 4-lane under the STRUP will be done on the RoW of the existing road corridors as much as possible. The direct impacts due to the construction of the project will be confined mostly to the previously disturbed corridors (i.e. on the existing available RoW). Some adverse impacts may occur on the immediately adjacent areas where land acquisition is necessary for the geometrical design of the road.

Environmental issues or parameters that will be potentially affected by the Project's associated activities can be categorized under the following main headings.

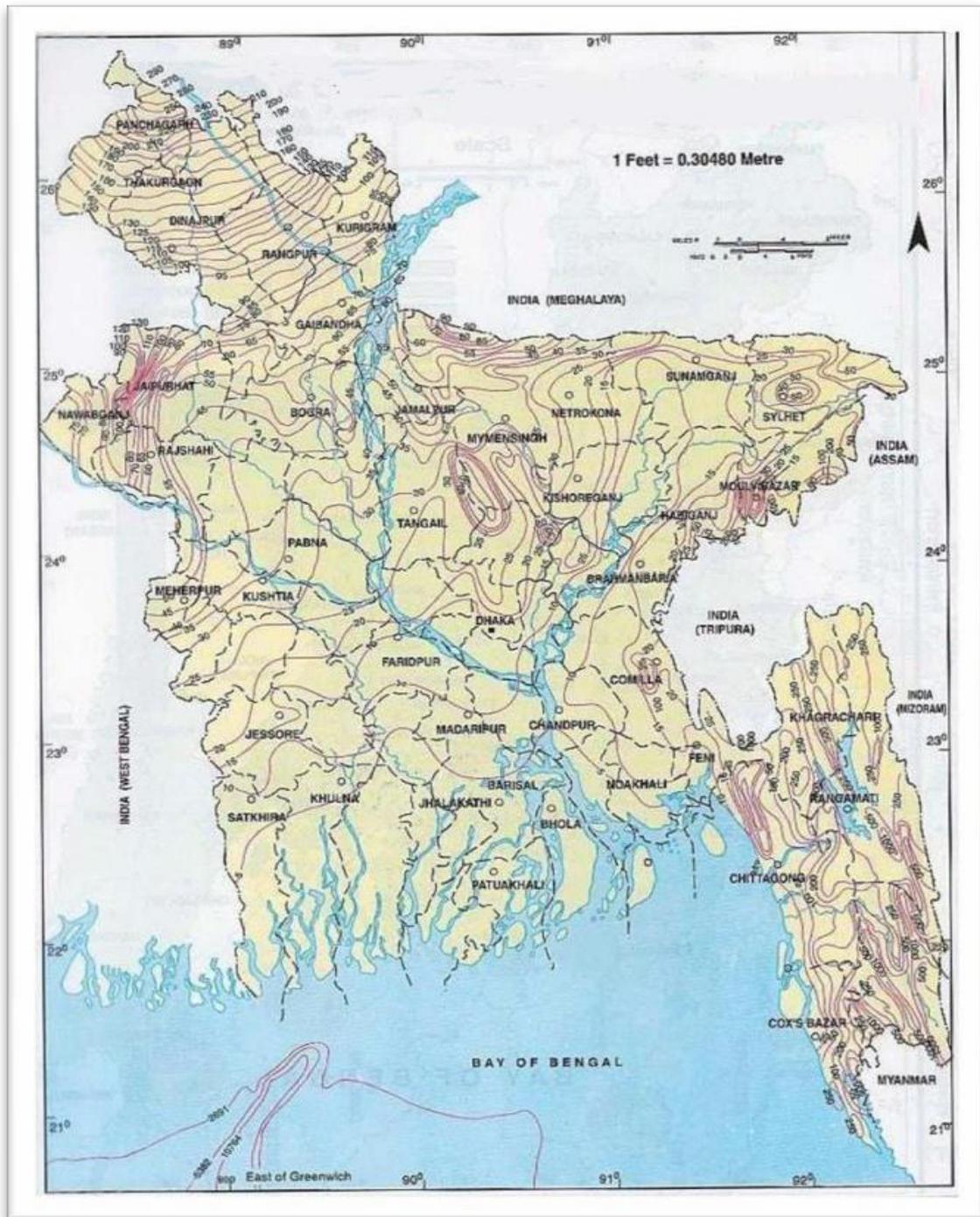
- Physical
- Ecological Resources
- Economic Development and
- Social and Cultural

Brief descriptions of the receiving environment of the project area are presented in the ensuing section.

### B. Physical Characteristics

#### a. Topography and Soil

85. The topography of the Sylhet district is flat with a little topographic relief. Elevations generally range between 6 meters above mean sea level along the western boundary of the district and 15 meters above msl in the eastern portion of the district. At the end of the project road at Tamabil in Jaintapur, the elevation is about 10-msl. About 78% of land is agricultural, of which 24% of land is categorized as medium-high-lands. Sylhet stands on the banks of Surma River surrounded by Khasia and the Jaintapur hills/valley on the north, and the Tripura Hills on the south. The road mainly passes through flat terrain except for a few kilometers at from Jaintapur to Tamabil, where the road passes through undulating hills. The topographical features Figure IV-1 of Sylhet district are as follows:



**Figure IV-1: Topography Map of Project Area**

86. The soil of the district is mainly formed in combination with the Surma Kushiya flood plain ridges and the sub recent piedmont basin. The northern part of the district contains the silty clay of the Surma-Kushiya flood-plain. The eastern part consists of rocky soil of the hilly region. The central part is mainly dominated by soil of the grey sandy loam of the sub recent piedmont flood plain. The soil is well drained and shallow flooding and droughty in dry season. The basin centers (Haors) remain wet throughout the dry season. Surface deposits are mainly heavy clay. The soil of the eastern and central parts is excellent for tea cultivation. The general soil characteristic of the project areas is presented in Table IV-1.

Table IV-1: Soils Characteristic of the Project Areas

| District | FLOODPLAIN SOILS |      |                |               |                  |                |                |                | HILL SOILS | TERRACE SOILS  |
|----------|------------------|------|----------------|---------------|------------------|----------------|----------------|----------------|------------|----------------|
|          | Non-Calcareous   | Peat | Non-Calcareous | Grey Piedmont | Acid Basin Clays | Non-Calcareous | Non-Calcareous | Brown Piedmont | Brown Hill | Deep Red-Brown |
| Sylhet   | O                | O    | O              | X             | X                | X              | X              | X              | X          | O              |

**Notes:** X indicates presence in the soil. O indicates not present

(Source: Statistical Yearbook of Bangladesh, Bangladesh Bureau of Statistics, 2017)

#### b. Climatic Conditions

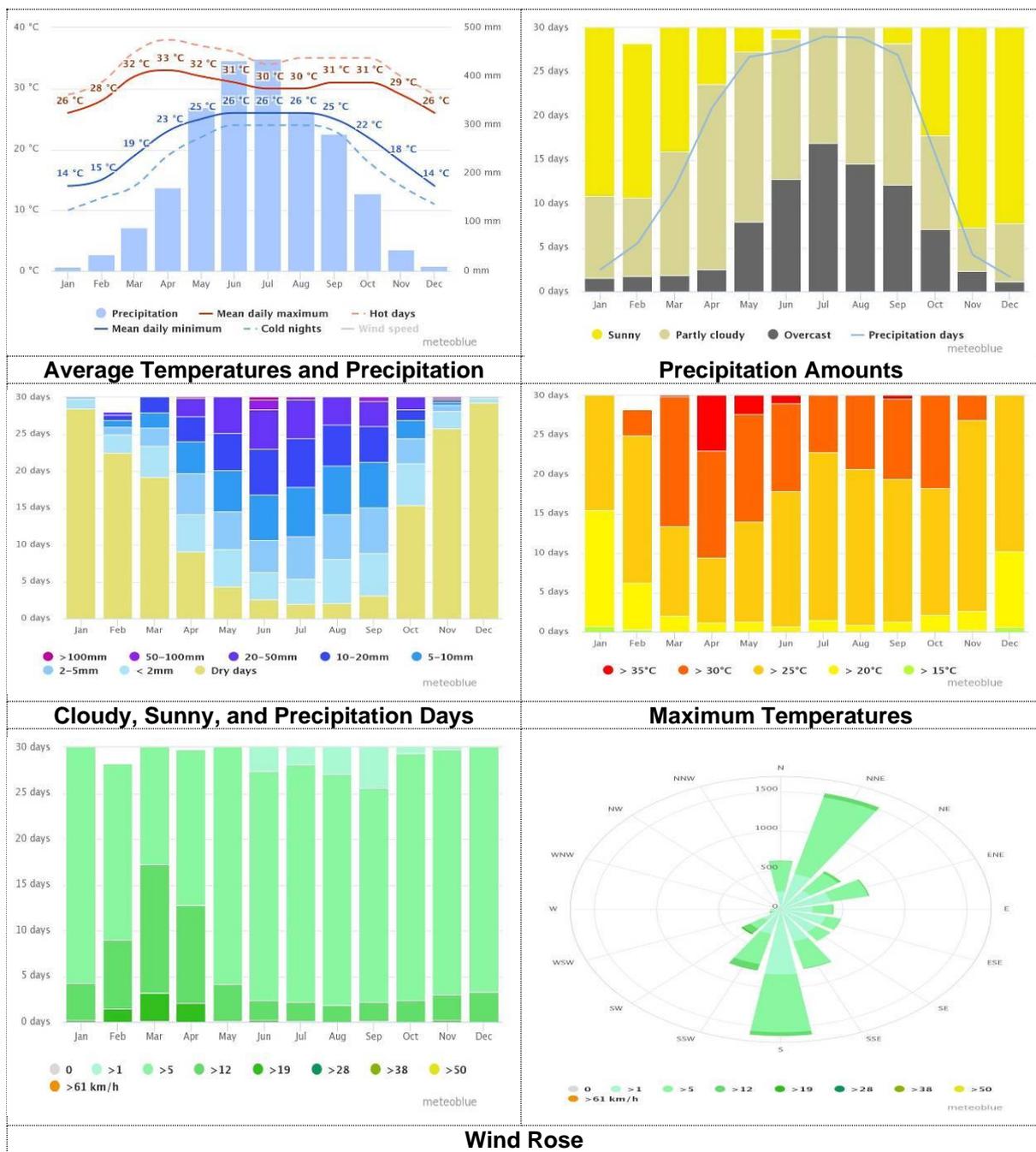
87. The climatic condition of the whole project area may be considered the same as reported in Sylhet meteorological station, since the stations are close to the project area. The maximum and minimum temperature and rainfall for six years from 2007 to 2017 is presented in Table IV-2.

Table IV-2: Maximum and Minimum Monthly Avg. Temperature and Rainfall of Project Area

| Years | Meteorological Data, Sylhet Station |           |           |           |                   |
|-------|-------------------------------------|-----------|-----------|-----------|-------------------|
|       | Temperature                         |           | Rain fall |           |                   |
|       | Max (°C)                            | Mini (°C) | Max (mm)  | Mini (mm) | Total Annual (mm) |
| 2007  | 37.0                                | 8.2       | 978       | 00        | 4617              |
| 2008  | 30.23                               | 20.19     | 761       | 00        | 3356              |
| 2009  | 31.83                               | 21.24     | 580       | 00        | 3287              |
| 2010  | 30.77                               | 21.10     | 946       | 00        | 1523              |
| 2011  | 37.8                                | 7.7       | 722       | 00        | 3101              |
| 2017  | 32.9                                | 14.2      | 1081      | 00        | 5947              |

(Source: Statistical Yearbook of Bangladesh)

88. Generally, the climatic condition of Sylhet is humid subtropical with a predominantly hot and humid summer and a relatively cool winter. The city is within the monsoon climatic zone, with annual average highest temperatures of 23 °C (Aug-Oct) and average lowest temperature of 7 °C (Jan). Nearly 80% of the annual average rainfall of 3,334 mm occurs between May and September. The maximum temperature 32.9 °C in 2017 and minimum 14.2 °C in 2017 were observed in Sylhet during 2017. Annually highest 5947 mm rainfall was in 2017. Generally, Sylhet division experiences very intensive rainfall (the highest in Bangladesh).



Source: [www.meteoblue.com](http://www.meteoblue.com)

**Figure IV-2: Historical Temperature and Rainfall Record at Sylhet Region**

89. The average monthly rainfall variation at Sylhet region (from 1985 to 2014) is shown in Figure IV-1. The hyetograph shows that the highest and lowest values of rainfall are observed during the months of July (351 mm) and December (50 mm) respectively.

**c. Flooding Pattern**

90. In Sylhet district, the main rivers are Surma and Kushiyara. Every year during the rainy season, when there is excessive rainfall in Sylhet, the surplus water flows through these rivers and causes floods in the low-lying areas in whole project areas due to over-bank spillage of the rivers, such as Old Surma, Kapna and Kushiara etc. Furthermore, there are many water bodies such as small branch-rivers, *khal*(canal) located within the Sylhet district.

91. Normal monsoon flood originates from high upland flow beyond the national boundary but when it is associated with higher local rainfall, the flood becomes devastating, prolonged and inundates a vast area of the country as well as the project area. It is noted that some sections of the project road were submerged during the devastating flood in 2004.

To control the drainage congestion of the catchment areas, a number of culvert and bridges are in place on the 2-lane existing road. The total number of bridges and culverts are 90, of which 24 are large to medium type bridges, and 66 are culverts.

#### d. Surface Water and Other Water Bodies

92. As discussed earlier, BWDB recording stations are available in nine stations along the project road. Only one station is 5km away from the road alignment. The results of the frequency analysis of the available water level data for all the stations in the project area are compiled in Table IV-1 below. These are used to determine the road formation level.

**Table IV-3: High Water Level Analysis Results Summary**

| Sl no. | Hydrological Gauging Station | Nearest Chainage of Road | HWL (m+PWD) |       |       |       |       |       |       |
|--------|------------------------------|--------------------------|-------------|-------|-------|-------|-------|-------|-------|
|        |                              |                          | 2           | 20    | 30    | 50    | 100   | 1998  | 2004  |
| 1.     | Sylhet (SW267)               | 236+00                   | 11.38       | 12.04 | 12.26 | 12.25 | 12.41 | 11.74 | 12.44 |
| 2.     | Sarighat (SW251)             | 269+00                   | 13.54       | 14.20 | 14.28 | 14.38 | 14.50 | 13.91 | 14.48 |
| 3.     | Jaflong_Spill (SW233A)       | 286+00                   | 13.47       | 14.92 | 15.02 | 15.42 | 15.79 | 13.96 | 13.50 |

#### e. Ground water

93. Bangladesh is rich in groundwater (GW) reserves and the annual recharge rate is high. Groundwater is subject to over-exploitation during the lean season for domestic, agricultural and industrial uses. The groundwater table (GWT) in the seven districts as well a major portion of Bangladesh exists at a shallow to moderate (Generally below 3.0 m) depth with confined, semi-confined and unconfined aquifers. The aquifers are being recharged by the major river systems and by infiltration of the rain water. The groundwater table fluctuates with season approaching near ground level (within 1.0 m) over most of the country during the wet season (July-September).

94. In Bangladesh, Arsenic (As) contamination in the groundwater extracted from the shallow aquifers is by far the worse in the world. It noted that, the groundwater extracts from Shallow Groundwater Table (SGWT) in the project areas is contaminated, while the Deep Groundwater Table (DGWT) is free of contamination but contains soluble iron in some parts. The standard for drinking water quality according to the ECR is presented in Appendix-1.

#### f. Geology and Seismicity

95. The project area under the Sylhet region is geologically known as the Surma Basin and covers the north-eastern parts of the fore deep (flat terrain) and Folded-Belt (hilly terrain) division of the Bengal Basin which happens to be one of the most prominent tectonically-active sedimentary basins of the world. Thickness of the sedimentary pile with the fore deep area is in excess of 15 kilometers; the Folded Belt representing the uplifted parts of this sedimentary pile. This huge sedimentary body is dominantly composed of sand and mud with subordinated limestone which started depositing in a deep-basement basin about 50 million years ago with the gradual rise of the Himalayas due to collision between Indian and Burmese Plates and subsequent erosion.

96. The Bengal Basin is situated in a seismically active zone as the basin site is surrounded by the Himalayan Arc and the Shillong Plateau in the north, the Mayanmarian Arc and Aracan, Yoma, Anticlinoria in the east and the Naga-Disang Thrust zone in north east. The Himalayan and Mayanmarian mountains are seismically active because of occurrence between the Indian and Eurasian Plates.

#### g. Earthquake

97. The Bangladesh National Building Code (1996) sub-divided Bangladesh into three seismic zones based on tremor intensities, vulnerability to earthquakes and possible severity of damage, possible severity of damage

98. The districts in the project area are within northeast region Bangladesh and falls into Seismic Zone 1 (over 0.25 Richter) the highest risk hazard zone.

99. Sylhet is located in a seismic zone-4, referred to as the very severe zone for earthquake in the country. The most severe earthquake prone zone, Zone 4 is in the northeast which includes Sylhet and has a maximum PGA value of 0.36g. Seismic events in Bangladesh are relatively infrequent, but historically, have been severe, such as the earthquakes of 1930, 1950 and 2004. To address any potential impacts due to seismic activities, provisions of the Bangladesh National Building Code (BNBC) 1993 and 2006 shall be strictly followed in the detailed designs of project components, apart from consideration of seismic vulnerability in the specifications for the design and construction of the works, including the choice of materials and methods for construction work. Earthquake Zones of Bangladesh is shown in Figure IV-3.

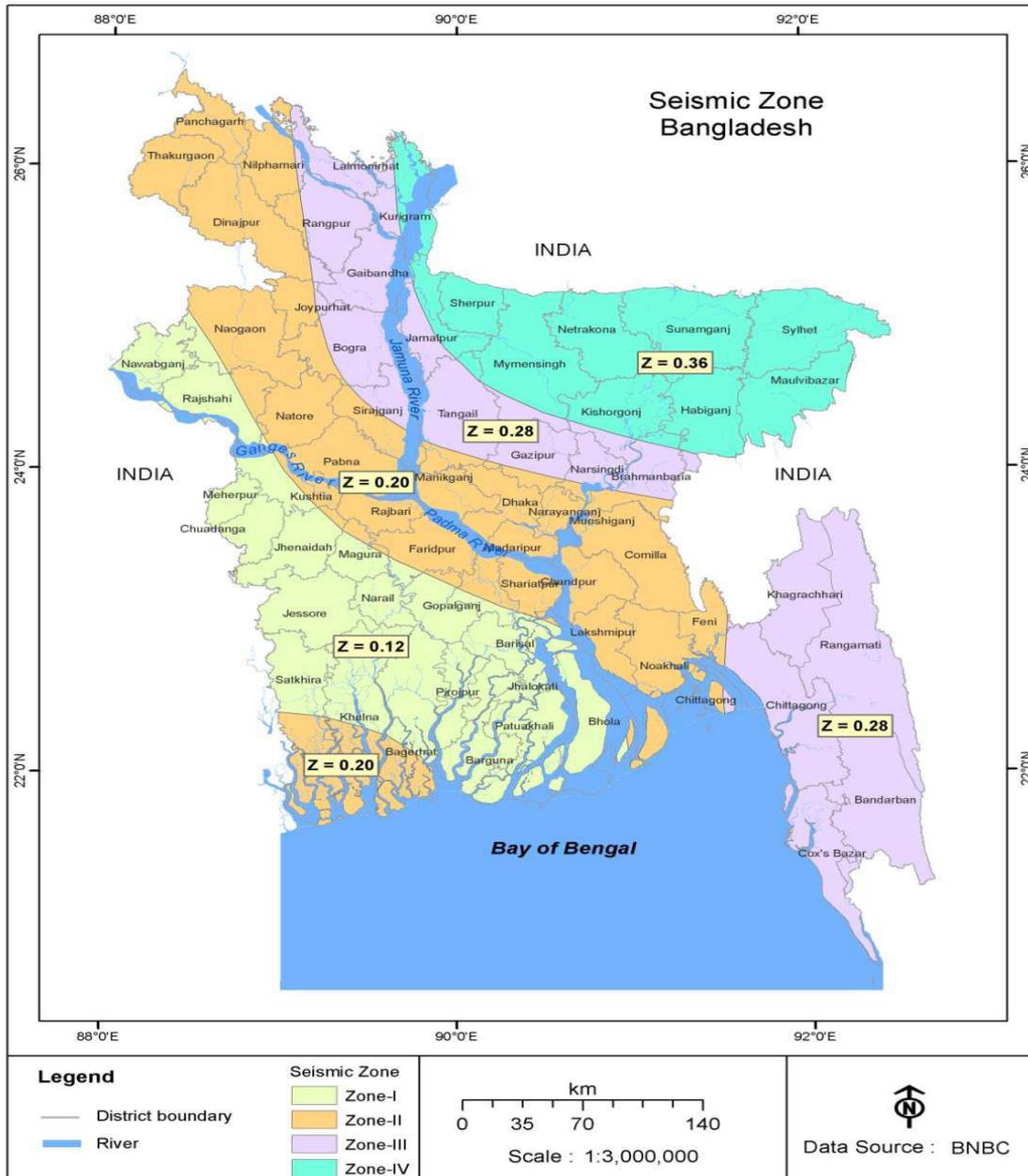


Figure IV-3: Earthquake Zone in Bangladesh

#### h. Air quality

100. The project road mostly passes through the rural areas, including some growth centers, *bazars*(markets), and small townships of Upazilla/ Union. The atmosphere in both rural and urban areas is less polluted during the rainy season than during the dry season.

This is because air quality within the rural areas is generally good due to the absence of urbanization, some industrial pollution, and densely populated areas. Air pollution is caused by emission of greenhouse gases from agriculture lands, perennial wetland swamps, road transport, Boulder stone field, and brick fields due to blowing of dust, dirt and smoke. The main pollutants around the roadside are those emitted from vehicle exhaust, such as particulate matter (PM), carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), nitrogen oxide (NO<sub>x</sub>), and sulfur oxide (SO<sub>x</sub>), etc. These emissions disperse widely into the atmosphere, and their concentration declines rapidly with the distance from the road edge. It is noted, that the highest concentration of CO, CO<sub>2</sub> and HC are encountered in congested slow-moving traffic, whereas the highest emission of NO<sub>x</sub> is encountered with high speed vehicles. In urban areas with congestion, such as Sylhet-Tamabil intersections, there is likely to be more air pollution than in rural areas. Ambient air quality measurements were carried out by separate sub consultants in August 2013 by consultants of SRTTP-2 and the results are shown below Table IV-4. Bangladesh standards on Air quality at different categories of environment presented in Appendix-4.

**Table IV-4: Ambient Air quality Measurement Results**

| Sampling ID and Location   | Sampling Site Description   | Description of Parameters               | Unit              | Concentration of Ambient Air Quality Parameters |         |         | DoE Standards |
|--|---|---|-------------------|---|---------|---------|---------------|
|  |   |   |                   | Minimum   | Maximum | Average |               |
| AAQ_09<br>(Mouzertek Roundabout, Shah Amanat Bridge)<br>22°18'39.6"N<br>91°51'24.6"E | <ul style="list-style-type: none"> <li>• Sampling of AAQ and NLM conducted at the roundabout of Shah Amanat Bridge</li> <li>• Vehicle count was very high</li> <li>• Vehicles carrying construction material observed</li> </ul>                  | Carbon Monoxide (CO)                    | µg/m <sup>3</sup> | 0   | 482     | 88.82   | 40,000        |
|  |   | Nitric Oxide (NO)                       | µg/m <sup>3</sup> | 0   | 300     | 83.87   | NSE*          |
|  |   | Nitrogen Dioxide (NO <sub>2</sub> )     | µg/m <sup>3</sup> | 0   | 0       | 0       | 100           |
|  |   | Sulphur Dioxide (SO <sub>2</sub> )      | µg/m <sup>3</sup> | 37  | 279     | 149.66  | 365           |
|  |   | Particulate Matter (PM <sub>10</sub> )  | µg/m <sup>3</sup> | 12  | 39      | 23.92   | 150           |
|  |   | Particulate Matter (PM <sub>2.5</sub> ) | µg/m <sup>3</sup> | 1   | 23      | 4.73    | 65            |
|  |   | Air Temperature                         | °C                | 27  | 29      | 28.01   |               |
|  |   | Relative Humidity                       | %                 | 60  | 67      | 63.38   |               |
|  |   | Wind Speed                              | kph               | 2.5   | 8.9     | 5.53    |               |
|  |   | Wind Direction                          | Degree            | 1   | 345     | 166.69  |               |
| Sampling ID and Location   | Sampling Site Description   | Description of Parameters               | Unit              | Quality Parameters                              |         |         | DoE Standards |
|  |   |   |                   | Minimum   | Maximum | Average |               |
| AAQ_02<br>(Notun Bridge Roundabout, Shaistaganj)<br>24°16'04.6"N<br>91°28'38.5"E     | <ul style="list-style-type: none"> <li>• Sampling of AAQ and NLM executed at Notun Bridge Bazar, Shaistaganj.</li> <li>• Vehicle count was high and visible emission observed.</li> <li>• Evidence of precipitation in last 24 hours.</li> </ul>  | Carbon Monoxide (CO)                    | µg/m <sup>3</sup> | 0   | 2288    | 556.24  | 40,000        |
|  |   | Nitric Oxide (NO)                       | µg/m <sup>3</sup> | 0   | 900     | 209.67  | NSE*          |
|  |   | Nitrogen Dioxide (NO <sub>2</sub> )     | µg/m <sup>3</sup> | 0   | 0       | 0       | 100           |
|  |   | Sulphur Dioxide (SO <sub>2</sub> )      | µg/m <sup>3</sup> | 0   | 705     | 116.9   | 365           |
|  |   | Particulate Matter (PM <sub>10</sub> )  | µg/m <sup>3</sup> | 0   | 266     | 76.35   | 150           |
|  |   | Particulate Matter (PM <sub>2.5</sub> ) | µg/m <sup>3</sup> | 0   | 22      | 6.35    | 65            |
|  |   | Air Temperature                         | °C                | 24  | 27      | 25.32   |               |
|  |   | Relative Humidity                       | %                 | 70  | 80      | 74.09   |               |
|  |   | Wind Speed                              | kph               | 1.2   | 6.8     | 3.64    |               |
|  |   |   |                   |   |         |         |               |
| Sampling ID and Location   | Sampling Site Description   | Description of Parameters               | Unit              | Concentration of Ambient Air Quality Parameters |         |         | DoE Standards |
|  |   |   |                   | Minimum   | Maximum | Average |               |
| AAQ_03<br>(Tamabil Land Port)<br>25°10'52.8"N<br>92°02'05.7"E                        | <ul style="list-style-type: none"> <li>• Sampling conducted at the intersection of Sylhet-Tamabil and Tamabil Custom House road.</li> <li>• Evidence of precipitation in last 24 hours.</li> <li>• Hilly area and vegetation was high.</li> </ul> | Carbon Monoxide (CO)                    | µg/m <sup>3</sup> | 0   | 282     | 151.46  | 40,000        |
|  |   | Nitric Oxide (NO)                       | µg/m <sup>3</sup> | 0   | 900     | 125.35  | NSE*          |
|  |   | Nitrogen Dioxide (NO <sub>2</sub> )     | µg/m <sup>3</sup> | 0   | 171     | 46.83   | 100           |
|  |   | Sulphur Dioxide (SO <sub>2</sub> )      | µg/m <sup>3</sup> | 0   | 267     | 66.88   | 365           |
|  |   | Particulate Matter (PM <sub>10</sub> )  | µg/m <sup>3</sup> | 0   | 7       | 1.35    | 150           |
|  |   | Particulate Matter (PM <sub>2.5</sub> ) | µg/m <sup>3</sup> | 1   | 20      | 7.74    | 65            |
|  |   | Air Temperature                         | °C                | 23  | 29      | 25.67   |               |
|  |   | Relative Humidity                       | %                 | 67  | 81      | 73.72   |               |
|  |   | Wind Speed                              | kph               | 1.1   | 7.3     | 3.95    |               |
|  |   | Wind Direction                          | Degree            | 4   | 347     | 171     |               |

- No standards established (NSE) yet

Remarks: Highest value from the amended schedule-2, 2005 of (Air quality standard) ECR 1997 has been considered.

#### i. Noise and Vibration

101. Generally, the main source of noise and vibration in and around the road is motorized traffic movement. Noise is generated from motor engines, vehicle transmission and exhaust systems, car horns and when heavy vehicles are unable to move freely. The noise level depends on traffic flow, speed and mode of transport, and road conditions, including the gradient and surface characteristics. Therefore, industrial and construction sites and road

vehicles are the major sources of noise. Though the project area is mostly rural, the noise level may be high in some sections due to poor conditions of the existing road and the narrow passageway for heavy traffic.

102. Noise levels in urban areas can be high due to construction activities, road traffic and car horns. At construction sites, heavy trucks, bulldozers, excavators, cranes, ballast machines, concrete mixers, and rock crushing plants are the major sources of noise. The cumulative impacts of noise pollution at construction sites may affect public health. Noise measurements were carried out by separate sub consultants in August 2013 and the results are shown below Table IV-5. Bangladesh standards on noise level at different categories of land use are presented in **Appendix-1**.

**Table IV-5: Noise Quality Measurement Results**

| Noise Measurement Test Results                          |                           |      |             |         |                 |               |
|---|---------------------------|------|-------------|---------|-----------------|---------------|
| Sampling ID and Location                                | Sampling Site Description | Unit | Noise Level |         |                 | DoE Standards |
|   |                           |      | Minimum     | Maximum | L <sub>eq</sub> |               |
| NM_03 (Tamabil Land Port)<br>25°10'52.8"N, 92°02'05.7"E | See Above                 | dB   | 46.4        | 73.6    | 61              | 60            |

## C. Ecological Resources

### a. Fisheries

103. Fisheries are one of the main resources in Bangladesh. The fisheries sector contributed 4.43% to national GDP, 22.21% to the agricultural GDP, and 2.73% to foreign exchange earnings by exporting fish products in 2010-11. Fish provides 60% of national animal protein consumption and plays an important role in rural employment generation and poverty alleviation in the country. In 2010-11, the total fish production was 30.62 lakh Metric Ton (MT). Average annual growth rate of fish production in the last 3 years was 6.11%. The production from closed water bodies has increased sharply due to dissemination of adaptive technologies and needs-based extension services rendered by Department of Fisheries. There are 260 freshwater and 475 marine fish species in the country. About 12 exotic species are being cultured in the country. Fish for local consumption is generally of freshwater varieties. There are three categories of major fisheries resources in the country, as follows (Source: [www.fisheries.gov.bd](http://www.fisheries.gov.bd));

- **Inland Capture fisheries:** comprises of rivers, ponds, estuaries, beels, floodplains, haors, baors, brackish water etc. There are 260 fish and 24 prawn species in inland fresh water in the country. Fish production from aquaculture has increased to a great extent but open water fish production is in slow progress. Now only about 34% of total fish production comes from inland open water.
- **Inland Culture fisheries:** About 12 exotic species are being cultured in the country. Indian major carps and exotic carp are largely cultured in the country. Beside Carp aquaculture, monoculture of Thi Pungus, Tilapia, Shorputi, Thai Koi are also practiced in the project area. Average fish production in the ponds is 3285 kg/ha/year. About 48% of total fish production comes from inland culture fisheries.
- **Marine Capture (18%) Fisheries:** The Bay of Bengal is situated in the south of Bangladesh. There is a total of 166,000 sq. km. water area including Exclusive Economic Zone (EEZ). Fishing is only confined within 200-meter depth. Pelagic and deep-sea resources are still untapped. In the year 2010-11 total fish production from Marine source was 5.46 lakh metric MT (18%). There is no marine capture fishing in the project area.

#### **Inland fishing undertaken in the project area includes:**

- **River/Canal Capture fishing:** Fishes are caught year-round within the branch rivers crossed by the road. The fish catch tends to peak in May to June, with the mass migration upstream of different type of fish in October to November, when the floods subside and fish return from floodplain to the rivers. The fish species are mainly carps, catfish, small shrimp, miscellaneous small fish, etc.

- **Floodplain Subsistence Capture fishing:** There is open access fishing across all flooded areas, *haors* and *beels* (seasonal freshwater lakes and marshes of the flood plains, which is bowl-shaped depression between the natural levees of a river) during the monsoon season. Subsistence fishing is generally undertaken by all most all rural households in the project area during this period. The common species available within the water bodies are catfish, snakehead, live fish and other smaller fishes.
- **Culture fishing:** Generally, culture fishing undertaken by the rural households from their cultured ponds and tanks. There are some low-lying agricultural lands which are seasonally flooded and used for fish culture. Alongside the project road many ponds are found and some of them are cultured ponds.

#### D. Aquatic Biology

104. The wetland ecosystem plays an important role in rural economy and maintains ecological balance in Bangladesh. The highly productive wetlands are rich in floral and faunal diversities. Nearly 1.1 million Bangladeshis thrive on wetlands fisheries while many more fish to supplement income. Wetlands are rich in medicinal, food, fuel wood, timber, fodder, ethno-botanical and other economic floral species.

105. The biggest wetland, Hakaluki *haor* located in Moulvibazar district in an area bordering Assam, India. It is a complex of more than 80 inter-connecting *beels* and this *haor's* designated an Ecologically Critical Area (ECA) by DOE. However, it is located 25 km away from the project road.

106. The eastern central region of Bangladesh is rich in aquatic biodiversity with 200 freshwater fish species. Based on the Integrated Biodiversity Assessment Tool (IBAT), there are six freshwater fish species and two amphibian species that are threatened or endangered and which may occur within 25 km of the project RoW.

| IUCN Status  | Scientific Name                  | Common Name              | Group      |
|--------------|----------------------------------|--------------------------|------------|
| <b>FAUNA</b> |                                  |                          |            |
| CR           | <i>Schisturapapulifera</i>       | Cave Loach               | Fish       |
| EN           | <i>Pillaiaindica</i>             | Hillstream Spineless Eel | Fish       |
| EN           | <i>Tor putitora</i>              | Putitor Mahseer          | Fish       |
| VU           | <i>Danio jaintianensis</i>       | Jaintia Daanio           | Fish       |
| VU           | <i>Physoschisturaelongata</i>    | Common Stone Loach       | Fish       |
| VU           | <i>Schisturareticulofasciata</i> | Stone Loach              | Fish       |
| EN           | <i>Bufoidesmeghalayanus</i>      | Khasi hill rock toad     | Amphibian  |
| VU           | <i>Ingerana borealis</i>         | Rotung oriental frog     | Amphibian  |
| VU           | <i>Liotelphusa quadrata</i>      | Freshwater crab          | Crustacean |
| VU           | <i>Bayaderahyalina</i>           | Dragonfly                | Insect     |

107. Additional aquatic fauna in the project area include Shamu (*Anastemusocitans*), Zhinuk (*Lamellideus marginalis*) and aquatic flora like Khudi Kachuripana (*Lemnaperpussilla*) are common.

##### a. Birds, Wildlife and Wetland Habitats

108. Bangladesh is rich in wildlife diversity and population; the different wildlife species are 388 avifauna, 110 mammals 109 reptiles, 22 amphibians, 266 fishes, 475 marine fishes, 66 corals and etc. The Integrated Biodiversity Assessment Tool (IBAT) identifies a number of threatened and endangered species that may occur within 25 km of the project RoW. Additional assessment of the habitat of each species was undertaken to eliminate those species which will not be impacted by the project. The tables below list the key species of concern for which mitigation measures have been included in the ESMP to avoid and minimize impacts.

| IUCN Status | Scientific Name      | Common Name (Bangla name) | Group  |
|-------------|----------------------|---------------------------|--------|
| CR          | <i>Axis porcinus</i> | Hog deer                  | Mammal |

|    |                               |                          |         |
|----|-------------------------------|--------------------------|---------|
| EN | <i>Aonyxcinereus</i>          | Asian small-clawed otter | Mammal  |
| VU | <i>Arctonyxcollaris</i>       | Greater hog badger       | Mammal  |
| VU | <i>Lutrogaleperspicillata</i> | Smooth-coated otter      | Mammal  |
| VU | <i>Panthera pardus</i>        | Leopard                  | Mammal  |
| VU | <i>Prionailurusviverrinus</i> | Fishing cat              | Mammal  |
| VU | <i>Ursusthibetanus</i>        | Asiatic black bear       | Mammal  |
| EN | <i>Cuoramouhotii</i>          | Keeled box turtle        | Reptile |
| EN | <i>Geoclemyshamiltonii</i>    | Spotted pond turtle      | Reptile |
| VU | <i>Ophiophagus Hannah</i>     | King cobra               | Reptile |
| VU | <i>Python bivittatus</i>      | Burmese python           | Reptile |

109. Several wildlife species have been eliminated from further consideration, as the project will not impact their known habitat (e.g. forested area). These include dhole, Asian elephant, Western hoolock gibbon, Indian pangolin, South Asian river dolphin, Phayres leaf monkey, binturong, sun bear, stump tailed macaque, northern pig-tailed macaque, sloth bear, Chinese goral, clouded leopard, Bengal slow loris, sambar, capped langur, elongated tortoise, Asian giant tortoise, and mugger. Justification for inclusion or exclusion of each species based on IUCN information can be found in Appendix-2.

110. Hakaluki Haor, located 25 km from the RoW, is an important site for wintering migratory birds. Every winter, tens of thousands of guest birds of about 150 species from Siberian and other cold regions flock to the haors. Based on the Integrated Biodiversity Assessment Tool (IBAT), 31 bird species that are threatened or endangered and which may occur within 25 km of the project RoW. Based on IUCN information related to species ecology, some species have been excluded from further consideration, as the project will not impact their known habitat (Appendix-2). These include the Steppe eagle, Rufous-necked hornbill, Dark-rumped swift, great hornbill, Wreathed hornbill, Beautiful nuthatch, and Tawny breasted wren babbler. The remaining key species of concern are below.

| IUCN Status | Scientific Name                   | Common Name             | Group |
|-------------|-----------------------------------|-------------------------|-------|
| CR          | <i>Ardea insignis</i>             | White-bellied heron     | Bird  |
| CR          | <i>Aythya baeri</i>               | Baer's pochard          | Bird  |
| CR          | <i>Emberiza aureola</i>           | Yellow-breasted bunting | Bird  |
| CR          | <i>Gyps bengalensis</i>           | White-rumped vulture    | Bird  |
| CR          | <i>Gyps tenuirostris</i>          | Slender-billed vulture  | Bird  |
| CR          | <i>Houbaropsis bengalensis</i>    | Bengal florican         | Bird  |
| CR          | <i>Sarcogyps calvus</i>           | Red-headed vulture      | Bird  |
| EN          | <i>Asarcornis scutulata</i>       | White-winged duck       | Bird  |
| EN          | <i>Haliaeetus leucoryphus</i>     | Pallas's fish-eagle     | Bird  |
| EN          | <i>Laticillacinera scens</i>      | Swamp grass-babbler     | Bird  |
| EN          | <i>Leptoptilos dubius</i>         | Greater adjutant        | Bird  |
| EN          | <i>Perdiculamanipurensis</i>      | Manipur bush-quail      | Bird  |
| EN          | <i>Sterna acuticauda</i>          | Black-bellied tern      | Bird  |
| VU          | <i>Aythya ferina</i>              | Common pochard          | Bird  |
| VU          | <i>Chaetornis striata</i>         | Bristled grass bird     | Bird  |
| VU          | <i>Clanga clanga</i>              | Greater spotted eagle   | Bird  |
| VU          | <i>Clanga hastata</i>             | Indian spotted eagle    | Bird  |
| VU          | <i>Columba punicea</i>            | Pale-capped pigeon      | Bird  |
| VU          | <i>Francolinus vulgaris</i>       | Swamp francolin         | Bird  |
| VU          | <i>Gallinago nemoricola</i>       | Wood snipe              | Bird  |
| VU          | <i>Leptoptilos javanicus</i>      | Lesser adjutant         | Bird  |
| VU          | <i>Mulleripicus pulverulentus</i> | Great slaty woodpecker  | Bird  |
| VU          | <i>Pellorneum palustre</i>        | Marsh babbler           | Bird  |

111. Additional bird species that occur in the area include Bright and Rose King-duck, Pati-duck, Bali Hash, Lenja, Chity, Sorali, Boikal, Nilshir Piyan, Pantamukhi, Pankouri, Buti-duck, China, Rangamuri, Black-duck, Peributhi, Chokachoki, Giria, Khonjona, Patari, Dolpipi, Water-hen, North-Giria, Dahuk, Patibatan, Common-chill, Cotton-Chill, Gergini, Cottontail, Pintail, Toughed Duck etc.

112. Temporary impacts to wildlife will occur during construction due to the felling of large number of roadsides trees. Trees will be replanted at a 1:5 sapling ratio (impacted to replant).

#### b. Trees and Forest

113. Terrestrial ecosystem at the SRTPPF site included settlement planting, strip plantation and block plantations. Dominant tree species in strip plantation are rain tree (*Samaneasaman*), krishnachura (*Cassia spp.*), debadaru (*Polyalthialongifolia*), mahogany (*Swietoniaspp*), raj koro ( *Albiziarichardiana*), babla (*Albizianilotica*), eucalyptus (*Eucalyptus camaldulensis*), jack fruit (*Artocarpusheterophyllus*), mango (*Maniferaindica*), etc. Settlement species are mango (*Mangiferaindica*), black berry (*Syzygiumcumini*), and jack fruit (*Artocarpusheterophyllus*), coconut (*Cocosnucifera*), betel nut (*Areca catechu*), hijal (*Baringtoniaacutangula*), mandar (*Erithraindica*), bamboo and several fuel wood species.

114. No community forestry or reserved forest is located alongside the project road. But many roadside flora (trees and vegetation) are present within the ROW. There are many timber varieties and different fruit trees which will be partially and /or fully affected by the widening of project road. Trees are identified in all sizes from mature trees to saplings. The terrestrial flora species are mainly mango, black berry, Jack fruit, mahogany, Akashmoni, Raintree, Battlenut, Bamboo bushes, etc. In addition, some homestead trees may be affected if additional land acquisition is required.



Roadside trees at the project road

115. A survey of roadside corridor of the existing carriageway was carried out by the Consultant team during the **field visit on September 2019 Inventory** Study of Sylhet-Tamabil project. Based on the survey, 19,800 mature trees out of a total of 162,077 are observed in the Sylhet-Tamabil road section (Table IV-6), though at this stage it is not possible to indicate the number of trees required to be felled for the construction of the road. If widening at one side of the existing road is done, then the felling of trees will be significantly less. Survey details are shown in Appendix-3.

**Table IV-6: Summary of Trees at the Existing Carriageway**

| Alignment       | Mature trees | Medium Size Trees | Small trees | Saplings | Total  |
|-----------------|--------------|-------------------|-------------|----------|--------|
| Sylhet- Tamabil | 19800        | 83246             | 54286       | 4745     | 162077 |

(Source: Roadside tree survey, September 2019, Sylhet-Tamabil)

#### c. Protected Areas

116. The project road does not pass through any protected areas. Two protected areas are located within 3 km of the proposed Right-of-Way (Khadimnagar National Park and Tilagorh Eco-Park), but neither will be negatively impacted by the widening of the road.

117. Historical, cultural, archaeological sites and national monuments are also protected, and the land use survey indicates some cultural sites are located within 20 meters from the edge of the existing carriageway corridor Appendix-3. At this stage, it is not possible to

indicate the number of cultural physical sites will be affected for the widening of the proposed road.

**E. Economic Development**

**a. Industries**

118. The Sylhet-Tamabil Road passes through the northeast region of the country where many large and medium industries have developed. In Sylhet, large business centers, local cottage industries, and townships are funded by the people who are living and working abroad, especially migrant people from Sylhet who are living in the UK. Presently, an Export Processing Zone (EPZ) in Sylhet has been established, and the Bollar (boulder) Ghat at Jafflong in Tamabil has become a local cottage industry. Many stone mining companies using heavy machinery extract stones from the river.

119. The Dawki Land Custom Station (LCS) in the Amlarem sub-division of Jaintapur Hills district of Meghalaya is a major land port and one of the oldest serving Northeast India. The major import/exports to India through the Tamabil inland port at Dawki are boulders, coal, and limestone. There is a big industry of boulder crushing, which has been developed at Tamabil.



Boulders imported from India through



Boulders crushed into stone chips



Tea garden at project side



Tamabil Approach Road condition

**b. Infrastructure**

120. The major infrastructure includes road and railway connection in the Sylhet district. An airport is also found in Sylhet. Historically, the important townships were connected by

4,053 km railway track that carried 44.5 million passengers (BBS 2007). The situation has changed since 1975, presently the length of LGED road is 251,610 km and RHD managed road is 20,878 km. As a result of the improved road transportation system, the district, sub-district (*Upazila*), and town growth centers are connected by all-weather roads. District-wide length of roads under RHD by Road Classification in 2016 is shown in Table IV-7.

**Table IV-7: District-wise Length of Roads under RHD by Road Classification, 2016**

| Name of Districts | National Highways (Km)<br>Width =7.32 m | Regional Highways (Km)<br>Width =5.49m | Zila Road (Km)<br>Width = 3.66m | Total Road (Km) |
|-------------------|---|--|---------------------------------|-----------------|
| Sylhet            | 140.21                                  | 165.094                                | 238.79                          | 544.094         |

Source: Statistical Yearbook of Bangladesh 2017, BBS.

### c. Transportation

121. The project road passes through Sylhet district and serves as a communication link with other parts of the country. Dhaka – Sylhet is also connected by railway, but from Sylhet to Tamabil, there is no railway link. In addition, Sylhet district has air transport facilities to Dhaka.

122. The proposed road extends to the international border at Tamabil that separates Bangladesh and Indian state of Meghalaya. The outpost on Sylhet-Shillong Road is about 55 km away from Sylhet town. Big trucks rely on the road for carrying export/ import goods between the two countries.

123. The following information has been obtained from the Consultants Traffic survey carried out in September 2019 for the feasibility study of Sylhet-Tamabil Road Table IV-8.

**Table IV-8: Traffic Projection including Generated Traffic -15% from 2024 to 2028, 10% From 2029**

| Traffic Projection including Generated Traffic -15% from 2024 to 2028, 10% From 2029 |                      |   |       |                   |           |          |     |                 |                             |                           |                            |                |                            |
|--|----------------------|---|-------|-------------------|-----------|----------|-----|-----------------|-----------------------------|---------------------------|----------------------------|----------------|----------------------------|
| Year   | FAST VEHICLES (nos.) |   |       |                   |           |          |     |                 |                             |                           | Total (nos.) Fast Vehicles | PCU (Fast Veh) | PCU excl MC (modified PCU) |
|  | 2-Wheeler Motorcycle | 3-Wheeler (Passenger & Goods) CNG Auto rickshaw | Car   | Utility/ Jeep/SUV | Micro Bus | Mini Bus | Bus | LCV, Mini truck | Medium Truck / Truck 2 Axle | Heavy Truck/ Truck 3 Axle |                            |                |                            |
| 2019   | 1,263                | 2,218   | 594   | 1,013             | 367       | 592      | 187 | 456             | 1,964                       | 389                       | 9,043                      | <b>15,715</b>  | 13,104                     |
| 2020   | 1,454                | 2,412   | 628   | 1,145             | 383       | 619      | 195 | 491             | 2,111                       | 418                       | 9,856                      | <b>16,939</b>  | 14,039                     |
| 2021   | 1,673                | 2,624   | 664   | 1,295             | 400       | 647      | 204 | 527             | 2,269                       | 449                       | 10,752                     | <b>18,269</b>  | 15,046                     |
| 2022   | 1,926                | 2,854   | 703   | 1,463             | 418       | 676      | 213 | 567             | 2,439                       | 482                       | 11,740                     | <b>19,717</b>  | 16,132                     |
| 2023   | 2,216                | 3,104   | 743   | 1,654             | 437       | 706      | 222 | 609             | 2,621                       | 519                       | 12,832                     | <b>21,294</b>  | 17,304                     |
| 2024   | 2,933                | 3,882   | 904   | 2,151             | 525       | 849      | 267 | 753             | 3,240                       | 641                       | 16,145                     | <b>26,465</b>  | 21,354                     |
| 2025   | 3,309                | 4,171   | 949   | 2,389             | 545       | 881      | 277 | 801             | 4,136                       | 912                       | 18,370                     | <b>31,058</b>  | 25,448                     |
| 2026   | 3,733                | 4,482   | 996   | 2,655             | 566       | 915      | 288 | 852             | 4,398                       | 970                       | 19,853                     | <b>33,211</b>  | 27,050                     |
| 2027   | 4,212                | 4,816   | 1,045 | 2,949             | 588       | 949      | 299 | 906             | 4,678                       | 1,031                     | 21,472                     | <b>35,531</b>  | 28,760                     |
| 2028   | 4,751                | 5,174   | 1,096 | 3,276             | 610       | 986      | 310 | 963             | 4,976                       | 1,097                     | 23,240                     | <b>38,033</b>  | 30,589                     |
| 2029   | 5,128                | 5,318   | 1,100 | 3,481             | 606       | 979      | 308 | 980             | 5,062                       | 1,116                     | 24,077                     | <b>38,962</b>  | 31,128                     |
| 2030   | 5,686                | 5,654   | 1,146 | 3,810             | 626       | 1,010    | 318 | 1,033           | 5,335                       | 1,176                     | 25,795                     | <b>41,333</b>  | 32,827                     |
| 2031   | 6,306                | 6,012   | 1,194 | 4,169             | 646       | 1,043    | 329 | 1,089           | 5,624                       | 1,240                     | 27,651                     | <b>43,866</b>  | 34,628                     |
| 2032   | 6,993                | 6,393   | 1,244 | 4,562             | 667       | 1,077    | 339 | 1,148           | 5,928                       | 1,307                     | 29,657                     | <b>46,575</b>  | 36,535                     |
| 2033   | 7,755                | 6,798   | 1,296 | 4,992             | 689       | 1,112    | 350 | 1,210           | 6,248                       | 1,377                     | 31,827                     | <b>49,472</b>  | 38,558                     |
| 2034   | 8,600                | 7,228   | 1,350 | 5,463             | 711       | 1,148    | 362 | 1,275           | 6,586                       | 1,452                     | 34,174                     | <b>52,573</b>  | 40,702                     |
| 2035   | 9,397                | 7,617   | 1,398 | 5,900             | 731       | 1,180    | 372 | 1,334           | 6,888                       | 1,519                     | 36,334                     | <b>55,396</b>  | 42,635                     |
| 2036   | 10,267               | 8,027   | 1,447 | 6,373             | 751       | 1,212    | 382 | 1,395           | 7,205                       | 1,588                     | 38,648                     | <b>58,389</b>  | 44,669                     |
| 2037   | 11,218               | 8,459   | 1,499 | 6,884             | 771       | 1,246    | 392 | 1,459           | 7,536                       | 1,661                     | 41,125                     | <b>61,566</b>  | 46,808                     |
| 2038   | 12,257               | 8,914   | 1,552 | 7,436             | 793       | 1,280    | 403 | 1,526           | 7,882                       | 1,738                     | 43,781                     | <b>64,938</b>  | 49,060                     |
| 2039   | 13,393               | 9,393   | 1,607 | 8,032             | 814       | 1,315    | 414 | 1,596           | 8,244                       | 1,818                     | 46,627                     | <b>68,520</b>  | 51,430                     |
| 2040   | 14,447               | 9,823   | 1,656 | 8,579             | 834       | 1,346    | 424 | 1,659           | 8,566                       | 1,888                     | 49,221                     | <b>71,754</b>  | 53,551                     |
| 2041   | 15,584               | 10,272  | 1,706 | 9,163             | 853       | 1,378    | 434 | 1,723           | 8,900                       | 1,962                     | 51,977                     | <b>75,161</b>  | 55,768                     |
| 2042   | 16,811               | 10,742  | 1,757 | 9,788             | 873       | 1,410    | 444 | 1,791           | 9,248                       | 2,039                     | 54,903                     | <b>78,751</b>  | 58,086                     |
| 2043   | 18,135               | 11,233  | 1,810 | 10,454            | 894       | 1,443    | 455 | 1,861           | 9,609                       | 2,118                     | 58,012                     | <b>82,535</b>  | 60,509                     |
| 2044   | 19,563               | 11,747  | 1,865 | 11,166            | 914       | 1,477    | 465 | 1,933           | 9,984                       | 2,201                     | 61,317                     | <b>86,525</b>  | 63,043                     |

#### d. Land uses

124. Land use within Sylhet is predominately rural and some sections are semi urban and urban, including rivers, canal and other water bodies. The landscape is predominantly hilly with undulating hills for the section between Sylhet-Tamabil. The lands use alongside the project road is as follows:

- **Larger, medium and small markets/ commercial areas:** Alongside the project road, there are a number of commercial areas, including 1 big Bazar (Jaintapur); 5 medium sizes Bazars (Darbasto Bazar, Boteshar Bazar, Haripur Bazar, Bangla Bazar and Dashpara Bazar); and 5 small Bazars (Porgona Bazar, Pirer Bazar, Baghar Sarak Bazar, Shukrabri Bazar and Domari Bazar). These areas are located alongside the project road outside of ROW or partially within the ROW. Details in **Appendix-3**.
- **Industries:** Sylhet Gas Field and Jalalabad Gas Field Ltd, industries are located in project area. But not affected proposed ROW alignment.
- **Mosque and other Sensitive areas:** within 20 meters of either side of the existing carriageway, a number of public buildings and sensitive areas are found. These include 40 Mosques, 5 Graveyards, 21 Public Institutions, 4 Hospitals, and 2 Power Development Boards. However, only 1 Mosque, 3 Madrasha, 1 Eidgha, and 2 Gate & Boundary walls will be affected by the proposed ROW alignment. Details in **Appendix-3**.
- **Rivers/canals and ponds:** The Surma, Sari, Boro Gang and Kapna rivers and some small rivers intersect with the project road. There are a few cultured ponds/Khals, Haor's that have been developed adjacent to the road.
- **Agricultural lands:** The project road passes primarily through agricultural lands which are classified as rural.

#### e. Agriculture

125. Agriculture in Bangladesh is based on rice production. This is supplemented by horticulture, livestock and fisheries in the farming system. The contribution of the subsistent agricultural economy is 21%. The majority of the Bangladesh population still depends directly or indirectly on traditional and subsistence agriculture. Surface water and ground water are both polluted due to leakage of agro-chemicals, seepage from poor sanitation systems, and rampant disposal of wastes and effluents. Bangladesh farmers still use several hazardous and internationally banned agro-chemicals like Parathion, BHC, Enduring and DDT for cultivation of paddy, horticultural crops and vegetables. These noxious agro-chemicals pollute the surface water in open water bodies due to lateral movement of these chemicals through run-off. Many farmers, either due to ignorance or knowingly, do not maintain the gestation periods specified for each before harvest and/or marketing the fruit and vegetable after these noxious insecticides are applied. Thus, the Public health requirements are undermined. The cultivated land classification for Sylhet is presented in Table IV-9.

**Table IV-9: Areas Land type Classes within the Districts under Project Areas**

| Districts | Hill  | Cultivated Lands Type Classification* |       |       |       |       |        | Miscellaneous land** | Total Lands |
|-----------|-------|---------------------------------------|-------|-------|-------|-------|--------|----------------------|-------------|
|           |       | HL                                    | MHL   | MLL   | LL    | VLL   | Total  |                      |             |
| Sylhet    | 14374 | 23010                                 | 81519 | 74315 | 68688 | 23471 | 271003 | 60026                | 345403      |

Note: Lands Type Classification\* HL=High land, MHL=Medium high land, MLL=Medium low land, LL=Low land, VLL= Very lowland. Miscellaneous lands include settlement, ponds, water bodies, river, channel, brick field etc. (Source: Soil Resource Development Institute, BBS, 2017)

126. Paddy is the main agricultural crop that will be impacted. Other crops are wheat, sugarcane, potato, pluses etc., In addition, jute, mustard seed, linseed, sesame, sweet potato, china and kaun are produced in Sylhet district. Varieties of vegetables like carrot, cauliflowers, brinjal, pumpkin, cucumber, beans, etc. Are also common in the project area.



Agricultural Lands at both sides of Project Road Section (Dry & Rainy Season)

#### f. Mineral Development

127. The greater Sylhet region is the most enriched area of Bangladesh in mineral resources. A large quantity of the gas reserve and oil field are located here. The area also has vast deposits of limestone, peat, glass-sand, and hard-rock gravel. The sedimentary body is primarily sand and mud with subordinated limestone. The sand-mud composition of the sedimentary body, along with technically-developed favorable structural set up (exposed and covered folds and faults mainly), have provided the Sylhet region with high potential for developing natural resources. Muds act as sources, sands as reservoirs, while folds (anticlines) act as traps for hydrocarbons (gas and oil).

128. The only oil field of the country is located in Haripur of the Sylhet district. The Haripur oil is discovered in sandstone layers within a subsurface fold called Sylhet Anticline which is about 13 km long and 3 km wide; producing horizons are around 2000 m depths and two closely spaced oil-horizons have been detected. Maximum oil reserve is estimated to be around 21 million barrels.

129. Lime stones of Eocene time are exposed on or close to the surface in the Takerghat-Lalghat areas of the north-western part of the Sylhet region along its border with the Indian state of Meghalaya. It is the second largest limestone reserve. The hard-rock gravels of up to 1 meter in diameter are found on the stream beds that drain the hilly areas of Meghalaya and fall on the flat land within Bangladesh territory along the northern parts of the Sylhet region. This is particularly prominent in the Jafflong-Tamabil area where total estimated reserve is about 45.6 million cubic meters. Gravels occur both on the present streambeds and up to several meters in depth. The mineral resources, such as natural gas, silica sand, mineral sand, are observed in the Sylhet region.

#### g. Tourism

130. No specific archaeological relic, historical site or architectural structure for tourist attraction exists alongside the project road. However, there are many sightseeing itineraries in the Sylhet district that attract both local and expatriate tourists.

131. In Sylhet, the tourist attractions include the Shrine of Hazrat Shah Jalal, Shah Farhanor, and Shah Paran, which are more than 500 years old, as well as the Temple of Sri Chaitanya Dev, Gour Gobindo, and Fort Palace of Jaintapur Kingdome, which is adjacent of Jaintapur Bazar. The international border located at Tamabil between Bangladesh and India is located 4-5 km from Jafflong. The Indian town of Dauki Bazar can be seen on the mountain, and there are many waterfalls (Sripur water fall and others) across the border from India to Tamabil.



View of Jaflong, Sylhet

## F. Social and Cultural

### a. Population and Composition

132. Bangladesh's population was 142.39 million in 2011 with average annual growth rate of 1.34% in 2010-2011 (Population & Housing Census 2011, Preliminary result, BBS July 2011). The total population of Sylhet District and project area (Upazila and Union) are presented in Table IV-10-12, based on the population and households (HHs) census of the BBS (2011).

**Table IV-10: Demography of Population Sylhet District**

| District | Total population | Male    | Female  | Both    | Sex ratio | HHs (no) | Average HHs size |
|----------|------------------|---------|---------|---------|-----------|----------|------------------|
| Sylhet   | 3434188          | 1726965 | 1707233 | 3434188 | 101       | 596081   | 5.74             |

Source: Population and household Census, BBS, Preliminary Results July 2011)

**Table IV-11: Demography of Population Upazila Project area**

| Name. of Upazila: | Total (Area)   | Total House Hold | Population     |                |                | Average HHs size |
|-------------------|----------------|------------------|----------------|----------------|----------------|------------------|
|                   |                |                  | Both           | Male           | Female         |                  |
| Sylhet            | 853026         | 596081           | 3434188        | 1726965        | 1707223        | 5.76             |
| Beani Bazar       | 62579          | 42119            | 253616         | 123939         | 129667         | 6.02             |
| DakhsinSurna      | 46373          | 43004            | 253388         | 126315         | 127073         | 5.89             |
| Golapganj         | 68777          | 50465            | 316149         | 154249         | 161900         | 6.26             |
| Gowainghat        | 118889         | 47992            | 287512         | 143877         | 143635         | 5.99             |
| Jaintapur         | 65758          | 27719            | 161744         | 80769          | 80975          | 5.84             |
| Kanaighat         | 96814          | 46147            | 263969         | 129319         | 144650         | 5.72             |
| <b>Total</b>      | <b>1312216</b> | <b>853527</b>    | <b>4970566</b> | <b>2485433</b> | <b>2495123</b> | <b>5.92</b>      |

Source: Project area, Population & Housing Ensure- BBS 2011

**Table IV-12: Demography of Population Union Project area**

| Name. of Union | Total (Area) | Total House Hold | Population |       |        | Average HHs size |
|----------------|--------------|------------------|------------|-------|--------|------------------|
|                |              |                  | Both       | Male  | Female |                  |
| Kuchai         | 3547         | 3164             | 19165      | 9759  | 9406   | 6.06             |
| Alivagaon      | 21603        | 7676             | 46204      | 22933 | 23271  | 6.02             |
| Fatepur        | 10023        | 3905             | 24766      | 12449 | 12317  | 6.34             |

|              |               |              |               |               |               |             |
|--------------|---------------|--------------|---------------|---------------|---------------|-------------|
| Darbastapur  | 15849         | 6690         | 40742         | 20267         | 20475         | 6.09        |
| Jaintapur    | 10870         | 4741         | 27178         | 13654         | 13524         | 5.73        |
| Nijpatpur    | 10913         | 5177         | 28496         | 13998         | 14498         | 5.50        |
| Khadimnagar  | 18844         | 9701         | 56460         | 29339         | 27121         | 5.82        |
| Chinknagul   | 8985          | 3684         | 21262         | 10791         | 10471         | 5.77        |
| PurbaJaflong | 11302         | 9664         | 50891         | 25663         | 25228         | 5.27        |
| <b>Total</b> | <b>111936</b> | <b>54402</b> | <b>315164</b> | <b>158853</b> | <b>156311</b> | <b>5.84</b> |

Source: Project area, Population & Housing Ensure- BBS 2011

### b. Health and Education Facilities

133. The Health Service facilities like elsewhere in Sylhet district and project area are provided by public and private sector organizations, NGOs and individual medical practitioners. GoB is responsible providing health services, education and training, hospital management and health policies. The private sector came in recent years making commercial investment in Health and Education sectors or under PPP (Private Partnership Projects). The situation regarding health services and education facilities are shown Table IV-13.

**Table IV-13: Health Service and Education Facilities in Sylhet District**

| Health service                          | Number | Education facilities                              | Number |
|---|--------|---|--------|
| Government Health Complex               | 1304   | Government Primary Schools                        | 506    |
| Private Hospitals/Clinics               | 57     | Non-Government and other Primary level Institutes | 165    |
| Diagnostic Centre                       | 84     | Non-Registered Primary Schools                    | 21     |
| Missionary Hospitals                    | 4      | Kinder Garden Schools                             | 266    |
| Number of physicians                    | 1272   | Number of NGO Schools                             | 425    |
| Number of Health centre/Family Planning | 51     |   |        |
| Community Clinics                       | 87     | Government Secondary Schools                      | 2      |
|   |        | Non- Government Secondary Schools                 | 185    |
|   |        | School and College Jointly                        | 261    |
|   |        | Government Colleges                               | 2      |
|   |        | Non-Government Colleges                           | 47     |
|   |        | Number of all Madrashas                           | 92     |
|   |        | Kawmi Madrashas                                   | 235    |
|   |        | Medical Colleges                                  | 6      |
|   |        | Agriculture and Veterinary College                | 1      |
|   |        | Engineering College                               | 2      |
|   |        | Private University                                | 4      |

. Source: BBS 2011

### c. Socio-Economic Condition

134. The people in the area are traditionally dependent on agriculture, but many people in the region have changed their source of income to include the garments sector, transport industry, and other industries.

135. Bangladesh imports boulders, coal, leather and limestone from India and exports pickles, juice, chips and other goods through the Tamabil port at Sylhet's Gowinghat Upazila and Jaintapur Upazila. There are authorized and un-authorized dumping yards for boulder stones at Tamabil-Dawki Land port, and many businessmen and workers' livelihoods depend on the boulder crushing industries which have developed at Tamabil land port.



Male and Female workers in boulder crushing plant at Tamabil



Tea Guard at sylhet-Tamabil road

136. Sylhet district like elsewhere in Bangladesh is prone to rapid urbanization that will be more accelerated due to the construction of the 4-lane road. Implementation of the proposed project will encourage more urbanization and increase land prices.

#### d. Archaeological Heritage, Relics and Historical Events

137. **Archaeological Heritage and Relics:** Stone monument of Jaintapur, Mound of Gharduara, Gaiyabi Mosque, tombs of Hazrat Shah Jalal (R.) and Shah Paran (R.), Abu Torab Mosque, Nawabi Masque, Mughal Mosque at Akhalia, Dhaka Dakshmin Temple, Tin Mandir (trio temple).

138. **Historical Events:** Sylhet is an ancient settlement area. It was known as Jalalabad in Sultani period. From the Pashchimbagh brass plate engraved by the Maharaja Shreechandra in 10th century, it could be assumed that he conquered Sylhet. Many historians think that Sylhet or Sreehatta (enriched market place) was an expanded commercial centre from the ancient period. A large number of Bengalees migrated to Sylhet. In the 14th century, Muslim saint from Yemen Hazrat Shah Jalal (R.) triumphed Sylhet and began to preach Islam. The Pathan valiant Khawja Osman fought against the Mughal with the help of local feudal. During the SEPOY REVOLT in 1857 the British traders defeated the mutinous. The Nankar revolt is another important event in the history of Sylhet. The Nankars were the serf of the zamindars. As a result of Nankar and other similar revolts the Nankar system was abolished in 1950.

139. There are no significant sites and structures of historical and archaeological importance along the road alignment.

#### e. Indigenous People and Use of Land

140. Most of the population in Bangladesh is Bengali. The minorities are indigenous peoples belonging to about 45 different ethnic groups. These groups are mainly concentrated in the north, and in the Chittagong Hill Tracts (CHT) in the southeast of the country.

141. The main ethnic groups in Sylhet are Khasi, Manipuri, Garo, Patro, Bishnupriya, Tripura and Santal. Among these groups the Manipuri and the Khasi are greatest in population in Sylhet Division. Each group has distinct linguistic and cultural practices. It is estimated that more than one hundred thousand indigenous people, (1.5% of Sylhet Division's population) live in Sylhet Division with various unique characteristics. Almost all of the regions that indigenous people inhabit are among the most remote areas with a large portion of people living a very hard life. The numbers of total households (HHs), tribal HHS and rural tribal HHs within the Sylhet district under the project area is presented in below.

| District | Total Population | Tribal Population | Total  | Tribal HHs |
|----------|------------------|-------------------|--------|------------|
| Sylhet   | 3434188          | 12781             | 596081 | 2484       |

Source: BBS, 2017

142. The project activities are located only within the Upazila/Union areas and impacts to ethnic communities/indigenous people's communities are not anticipated

### G. Socio-Economic Information and Profile

#### a. Introduction

143. This section deals with four issues. These are:

- Socio-economic profile of all project displaced persons;
- Socio-economic profile of all female project displaced persons;
- Profile of the population in project displaced persons households / families; and
- Female involvement in income earning activities.

#### b. Socio-Economic Profile of All Project Displaced Persons (PDPs)

144. Socio-Economic Profile of the Project Displaced Persons are discussed here under three Indicators: Demographic, Social and Economic Characteristics. Data required for meeting the requirements of various indicators were collected through the SES commissioned to all the PDPs during the months of July – August 2014. Data was collected through interviews and the answers were documented in a structured questionnaire. The RAP will include an updated census and is under preparation as of August 2019.

#### c. Demographic Characteristics

145. Demographic characteristics of the Project Displaced Persons (PDPs) included in the survey were: Sex, Age, Ethnicity, Religion and Family Size. Of these five indicators, three (Sex, Age and Ethnicity) are relevant for determining compensation entitlements. Older PDPs, ethnic minorities and female PDPs are considered vulnerable. Distribution of the total 1948 PDPs by demographic characteristics is provided in Table IV-14.

**Table IV-14: District-wise Demographic Characteristics of Project Displaced Persons**

| Indicators           |      | District-wise data |
|----------------------|------|--------------------|
| Name of district     |      | Sylhet             |
| Length of road in Km |      | 56.16              |
| Total number of PDPs |      | 1948               |
| PDPs by sex          | Male | 1921               |

|                      |            |      |
|----------------------|------------|------|
|                      | Female     | 27   |
| PDPs by age in years | Up to 45   | 1534 |
|                      | 46-60      | 314  |
|                      | Above 60   | 100  |
| PDPs by ethnicity    | Bengali    | 1948 |
|                      | Indigenous | 0    |
| PDPs by religion     | Islam      | 1754 |
|                      | Hindu      | 193  |
|                      | Others     | 1    |
| PDPs by family size  | Up to – 3  | 518  |
|                      | 4 to 6     | 1204 |
|                      | Above 6    | 226  |

**Source:** SES commissioned during July – August 2014.

Salient features of the table are:

- i. Number of PDPs per km is 34.69;
- ii. Of the total PDPs (1948) only 1.39% (27) are female and all of them will be considered as Vulnerable entitled to cash grant of Tk. 5000 each;
- iii. PDPs in the age group of above 60 years is 100 people; i.e. 5.13% of the total, and all of them will be considered as Vulnerable and entitled to Tk. 5000 as cash grant;
- iv. No ethnic minority was found among the 1948 PDPs;
- v. Distribution of PDPs between the religions: Islam and Hindu / others are **90.09%** and **9.91%** respectively; and
- vi. Around 62% of the PDPs had family size between 4-6 persons with the median as 5.

#### d. Social Characteristics

146. Social Characteristics of the Project Displaced Persons (PDPs) included in the SES were: Literacy, Physical Fitness and Types of Family. Of these three indicators, only one (Physical Fitness) is relevant for determining compensation entitlements. If any of the PDPs are found partially or fully disabled, they will be considered as Vulnerable.

**Table IV-15: District-wise Social Characteristics of Project Displaced Persons**

| Indicators                |                    | District-wise data |
|---------------------------|--------------------|--------------------|
| Name of district          |                    | Sylhet             |
| Length of road in Km      |                    | 56.16              |
| Total number of PDPs      |                    | 1948               |
| PDPs by level of literacy | Illiterate         | 132                |
|                           | Up to class – v    | 662                |
|                           | vi – x             | 543                |
|                           | SSC & HSC          | 475                |
|                           | Above HSC          | 136                |
| PDPs by physical fitness  | Perfect            | 1938               |
|                           | Partially disabled | 9                  |
|                           | Fully disabled     | 1                  |
| PDPs by type of family    | Nuclear            | 1051               |
|                           | Joint              | 897                |

**Source:** SES commissioned during July – August 2014.

Salient features of the table are:

- i. Only 6.78% of the total 1938 PDPs were illiterate and on the other side, 6.98% had level of literacy above Higher Secondary Certificate (HSC);
- ii. Ten (0.51%) of the PDPs claimed that they are physically disabled, and each of them will be considered as Vulnerable and are entitled to a cash grant of Tk. 5000; and
- iii. The distribution between Nuclear and Joint families was 53.95 and 46.05 percent respectively.

**e. Economic Characteristics**

147. In the SES, Economic characteristics of the PDPs covered 2 Indicators: Principal Occupation and Family Income. Of these 2 Indicators, only one (annual family income) is related to compensation (very poor PDPs will be considered as vulnerable). Distribution of the 1948 PDPs among the Variables of Indicators are given in Table IV-16.

**Table IV-16: District-wise Economic Characteristics of Project Displaced Persons**

| Indicators                                 |                        | District-wise data |
|--|------------------------|--------------------|
| Name of district                           |                        | Sylhet             |
| Length of road in Km                       |                        | 93                 |
| Total number of PDPs                       |                        | 1948               |
| Principal occupation                       | Agriculture            | 8                  |
|  | Fishery + Livestock    | 1                  |
|  | Business               | 1859               |
|  | Service                | 17                 |
|  | Labor                  | 30                 |
|  | Family Mgt.            | 2                  |
|  | House Wife             | 1                  |
|  | Others                 | 30                 |
| Annual family income of PDPs in "000" Taka | Up to – 60 (very poor) | 81                 |
|  | Above 60 – 84 (poor)   | 24                 |
|  | Above 84 – 100         | 28                 |
|  | Above 100 – 200        | 800                |
|  | Above 200 – 500        | 845                |
|  | Above 500 – 1000       | 135                |
|  | Above 1000             | 35                 |

**Source:** SES commissioned during July – August 2014

Salient features of the table are:

- i. Of the total PDPs (1948), 95.43% (1859) claimed Business as their principal occupation; and
- ii. PDPs in the annual income group of up to Tk. 60,000 was 81 (4.16%), and all of them will be considered as Vulnerable and are entitled to a cash grant of Tk. 5000.

**f. Gender: Socioeconomic Profile of Female PDPs**

148. For documenting the Socio-Economic Profile of the Female PDPs, data were collected on their Demographic, Social and Economic Characteristics. It is to be noted that all the Female PDPs will be considered as Vulnerable. If any of them is characterized by other indicators of Vulnerability, it will be an added advantage for them to receive cash grant under Vulnerability.

**g. Nature of Displacement of Female PDPs**

149. The nature of displacement of the 27 female PDPs has been analyzed both in terms of land ownership and land use type. Table IV-17 provides the detail.

**Table IV-17: Nature of Displacement of the 61 Female PDPs**

| Indicators                  |                  | District-wise data |
|-----------------------------|------------------|--------------------|
| Name of district            |                  | Sylhet             |
| Total number of female PDPs |                  | 27                 |
| Ownership of land           | Own land         | 12                 |
|                             | Govt. land       | 6                  |
|                             | Both ownership   | 0                  |
|                             | Rented structure | 9                  |
| Types of use                | Homestead        | 9                  |
|                             | Business         | 17                 |
|                             | Home & business  | 1                  |
| Losers of structure         |                  | 18                 |

**Source:** SES conducted during July – August 2014

- i. Of the 27 female PDPs, 12 (44.45%) will be displaced from their own land, 6 (22.22%) from government land and the rest 9 (33.33%) from rented structures. According to land use, 9 (33.34%) are homestead, 17 (62.96%) are business and 1 (3.7%) is both a homestead& business.

#### h. Demographic Characteristics of Female PDPs

150. Of the total 1948 PDPs, only 27 (1.39%) are female. Their age, ethnicity, religion and family size are given in Table IV-18. It is to be noted that all the female PDPs will be considered as Vulnerable. In addition, those who are above 60 years of age and belong ethnic minority have the two additional indicators of being included in the vulnerable grant.

**Table IV-18: District-wise Demographic Characteristics of Female Project Displaced Persons**

| Indicators                  |            | District-wise data |
|-----------------------------|------------|--------------------|
| Name of district            |            | Sylhet             |
| Length of road in Km        |            | 56.16              |
| Total number of PDPs        |            | 1948               |
| Total PDPs by sex           | Male       | 1921               |
|                             | Female     | 27                 |
| Female PDPs by age in years | Upto – 45  | 19                 |
|                             | 46-60      | 5                  |
|                             | Above 60   | 3                  |
| Female PDPs by ethnicity    | Bangali    | 27                 |
|                             | Indigenous | 0                  |
| Female PDPs by religion     | Islam      | 26                 |
|                             | Hindu      | 1                  |
| Female PDPs by family size  | Up to – 3  | 16                 |
|                             | 4 to 6     | 11                 |
|                             | Above 6    | 0                  |

**Source:** SES commissioned during July – August 2014.

Salient features of the table are:

- of the total 27 female PDPs, only 3 (11.11%) are above 60 years of age and they will receive cash grant for this indicator also;
- none of the female PDPs belong to ethnic minority;
- around 97% of them belong to the religion, Islam; and
- less than 50% had family size of 4-6 members

### i. Social Characteristics of Female PDPs

151. Issues included in the table of Social Characteristics are: Literacy, Physical Fitness and Type of Family, Findings of the SES of the 27 female PDPs have been documented in Table IV-19.

**Table IV-19: District-wise Social Characteristics of Female Project Displaced Persons**

| Indicators                       |                    | District-wise data |
|----------------------------------|--------------------|--------------------|
| Name of district                 |                    | Sylhet             |
| Length of road in Km             |                    | 56.16              |
| Total number of PDPs             |                    | 27                 |
| Female PDPs by level of literacy | Illiterate         | 8                  |
|                                  | Up to class – v    | 10                 |
|                                  | vi – x             | 3                  |
|                                  | SSC & HSC          | 5                  |
|                                  | Above HSC          | 1                  |
| Female PDPs by physical fitness  | Perfect            | 27                 |
|                                  | Partially disabled | -                  |
|                                  | Fully disabled     | -                  |
| Female PDPs by type of family    | Nuclear            | 24                 |
|                                  | Joint              | 3                  |

**Source:** SES commissioned during July – August 2014.

Important findings of the table are:

- i) at the bottom only 8 (29.63%) of the female PDPs are illiterate and at the top about 22.22% are in the group Secondary School Certificate and above;
- ii) of the total 27 female PDPs, none reported to be fully or partially disabled; and,
- iii) 88.89% (24) were in living in nuclear family.

### j. Economic Characteristics of Female PDPs

152. Economic Characteristic of the Female PDPs included their principal occupation, income earners in their families and their family income. Findings of SES in these respects are furnished in Table IV-20.

**Table IV-20: District wise Economic Characteristics of Female Project Displaced Persons**

| Indicators  |                        | District-wise data |
|---|------------------------|--------------------|
| Name of district                                  |                        | Sylhet             |
| Length of road in Km                              |                        | 56.16              |
| Total number of PDPs                              |                        | 1948               |
| Total female PDPs                                 |                        | 27                 |
| Principal occupation of female PDPs               | Business               | 19                 |
|   | Labor                  | 2                  |
|   | House Wife             | 1                  |
|   | Others                 | 5                  |
| Total income earners in the family                | Male                   | 23                 |
|   | Female                 | 11                 |
|   | Total                  | 34                 |
| Annual family income of female PDPs in "000" Taka | Up to – 60 (very poor) | 7                  |
|   | Above 60 – 84 (poor)   | 2                  |
|   | Above 84 – 100         | 2                  |
|   | Above 100 – 200        | 7                  |
|   | Above 200 – 500        | 6                  |
|   | Above 500 – 1000       | 1                  |
|   | Above 1000             | 2                  |

**Source:** SES commissioned during July – August 2014.

Important findings of the table are:

- i) during the SES, 70.37% (19) of the female PDPs were engaged in some kinds of business;
- ii) total number of income earners in the 25 families was 34, i.e, 1.33 per family; and
- iii) a total of 7 (25.93%) of them were in the annual income group, upto Tk. 60,000 (very poor) and each of them will be considered as Vulnerable and are entitled to a cash grant of Tk. 5000.

#### **k. Female PDPs in NGOs**

153. Non-Government Organizations (NGOs) are working in Bangladesh with the special aim of reducing economic poverty. In the implementation process, they encourage the poor adult females to become members of their organizations.

154. The two principal components of their programs are: mobilization of savings and credit support for various Income Generation Activities (IGAs). Table IV-21 reflects the association of the female PDPs with the NGOs.

**Table IV-21: Female PDPs Association with NGOs**

| Indicators                              |                   | District-wise data |
|---|-------------------|--------------------|
| Name of district                        |                   | Sylhet             |
| Number of PDPs                          |                   | 1948               |
| Number of female PDPs                   |                   | 27                 |
| Number of female PDPs working with NGOs | Govt. org. group  | 1                  |
|   | ASA               | 1                  |
|   | GB                | 3                  |
|   | BRAC              | 1                  |
|   | PROSHIKA          | 1                  |
|   | Local NGOs        | 1                  |
|   | Not with any NGOs | 19                 |

**Source:** SES commissioned during July – August 2014.

- i. Of the total 27 female PDPs, only 8 (29.63%) are associated with NGOs. This reality implies that there is enough scope for the poor PDHs to be involved in the NGOs' poverty reduction activities as a part of Income Restoration and Rehabilitation, an important component of Resettlement.

#### H. Profile of the Population in PDPs Households

155. Under this sub-heading, the Resettlement Framework has covered 5 issues including:

- affected population by sex and age;
- population by current activity status;
- population by literacy;
- occupations of All Female Income Earners; and
- PDPs female family members in NGOs.

156. None of the above issues are directly related to cash compensation. Instead, these help in understanding the gender situation, scope for integrating gender in the NGOs' poverty reduction activities, and options for livelihood restoration. Above all, it informs the size and types of population that will be affected within the proposed RoW.

##### a. Population by Sex and Age

157. Total population in the 1948 PDPs households / families was enumerated as 8829 during the SES commissioned in July – August 2014. The average Family Size and Sex Ratio were 4.53 and (female: male=1: 1.1) respectively. Of the total populations around 31.93% were demographically dependent (population within 14 and above 60 years).

**Table IV-22: Population District-wise Age and Sex of Project Affected Population**

| Indicators                      |            | District-wise data |
|---------------------------------|------------|--------------------|
| Name of district                |            | Sylhet             |
| Number of PDPs                  |            | 1948               |
| Total population by Sex         | Male       | 4583               |
|                                 | Female     | 4246               |
|                                 | Total      | 8829               |
| Population by age group in year | Up to 6    | 943                |
|                                 | 7 to 14    | 1376               |
|                                 | 15 – 30    | 3106               |
|                                 | 31 – 45    | 1808               |
|                                 | 46 – 60    | 1096               |
|                                 | Above – 60 | 500                |
| Average family size             |            | 4.53               |
| Sex Ratio (female: male)        |            | 01:01.1            |

**Source:** SES conducted during July – August 2014

### b. Population by Current Activity Status

158. Current activity status of the affected population in PDPs households/families is of high importance for knowing the total situation. This helps in planning their use in IGAs in future for income restoration and other actions needed for their overall socio-economic development.

**Table IV-23: -District wise Population in Relation to Current Primary Activities and Sex**

| Indicators                     |        | District-wise data |
|--------------------------------|--------|--------------------|
| Name of district               |        | Sylhet             |
| Number of PDPs                 |        | 1948               |
| Total population               | Male   | 4583               |
|                                | Female | 4246               |
|                                | Total  | <b>8829</b>        |
| Age ≤ 6 years minor            | Male   | 371                |
|                                | Female | 572                |
|                                | Total  | <b>943</b>         |
| Student                        | Male   | 1087               |
|                                | Female | 1132               |
|                                | Total  | <b>2219</b>        |
| 7 – 14 years not in any school | Male   | 1                  |
|                                | Female | 5                  |
|                                | Total  | <b>6</b>           |
| House wife                     |        | <b>1890</b>        |
| Family management              | Male   | 112                |
|                                | Female | 76                 |
|                                | Total  | <b>188</b>         |
| Agriculture                    | Male   | 92                 |
|                                | Female | 10                 |
|                                | Total  | <b>102</b>         |
| Labor                          | Male   | 135                |
|                                | Female | 22                 |
|                                | Total  | <b>157</b>         |
| Service                        | Male   | 108                |
|                                | Female | 11                 |
|                                | Total  | <b>119</b>         |
| Business                       | Male   | 2131               |
|                                | Female | 47                 |
|                                | Total  | <b>2178</b>        |
| Unemployed                     | Male   | 71                 |
|                                | Female | 20                 |
|                                | Total  | <b>91</b>          |
| Assist in domestic work        | Male   | 3                  |
|                                | Female | 2                  |
|                                | Total  | <b>5</b>           |
| No specific work               | Male   | 94                 |
|                                | Female | 140                |
|                                | Total  | <b>234</b>         |
| Physically not fit             | Male   | 252                |
|                                | Female | 250                |
|                                | Total  | <b>502</b>         |
| Others                         | Male   | 126                |
|                                | Female | 69                 |
|                                | Total  | <b>195</b>         |

**Source:** SES conducted during July – August 2014

The salient features of this table are:

- total number of children (7-14 years) outside any educational institution is highly negligible, only 6;
- of the total population (8829), 943 (10.68%) are minor (below 7 years of age);
- those who claimed as unemployed, their number was only 91 (1.03%) of the total population);
- similarly, those who said to be physically unfit to work was (5.69%) total population;
- total number of students was enumerated at 2219 i.e 25.13% of the total population (8829);
- 24.67% of the total population mentioned their principal occupation as Business; and
- in sharp contrast to it, the 3 other major occupations (agriculture + labour + service) together shared only 4.28% of total current activities status.

### c. Population by Literacy

159. Road side population is always in advantageous situation in receiving the positive impacts of various socio-economic development programmers. The result is well reflected at the overall literacy situation. The literacy rate among the family members of PDPs was found to be very high, around 96.41%. Moreover, around 16.65% of the population had the level of SSC and above.

**Table IV-24: Literacy Situation among the Project Affected Population**

| Indicators               |        | District-wise data |
|--------------------------|--------|--------------------|
| Name of district         |        | Sylhet             |
| Total population         |        | 8829               |
| Population above 7 years |        | 7048               |
| Illiterate               | Male   | 188                |
|                          | Female | 129                |
|                          | Total  | <b>317</b>         |
| Up to Class – v          | Male   | 1575               |
|                          | Female | 1571               |
|                          | Total  | <b>3146</b>        |
| Vi – x                   | Male   | 1095               |
|                          | Female | 1020               |
|                          | Total  | <b>2115</b>        |
| SSC & HSC                | Male   | 660                |
|                          | Female | 401                |
|                          | Total  | <b>1061</b>        |
| Above HSC                | Male   | 307                |
|                          | Female | 102                |
|                          | Total  | <b>409</b>         |
| Total literacy rate      | Male   | 95.08              |
|                          | Female | 96                 |
|                          | Total  | <b>95.5</b>        |

**Source:** SES conducted during July – August 2014

### I. Gender: Females Involvement in Income Earning and NGOs Activities

160. Under the above subhead the report has considered 2 issues. These are:

- occupations of all female income earners; and
- PDPs female family members in NGOs.

161. It is to be noted that here all the females (including the female PDPs) of 1948 PDPs families have been taken to consideration.

#### a. Occupations of All Female Income Earners

162. In total 429 females of the PDPs households said that they were involved in income earning activities. Types of works done by them are in Table IV-25.

**Table IV-25: Earners Occupations of All Female Income Earners**

| Indicators                      |             | District-wise data |
|---------------------------------|-------------|--------------------|
| Name of district                |             | Sylhet             |
| Number of PDPs                  |             | 1948               |
| Number of female income earners |             | 159                |
| Occupations                     | Agriculture | 10                 |
|                                 | Labor       | 22                 |
|                                 | Service     | 11                 |
|                                 | Business    | 47                 |
|                                 | Others      | 69                 |

**Source:** SES conducted during July – August 2014

i. Of the income earning activities, around 29.56% was claimed by business. As a part of income restoration activities, the INGO (PIA) may be asked by the PEA (RHD) to integrate them with the NGOs functioning in the respective areas. This will help the PDPs families in Income Restoration and Rehabilitation, an important component of Resettlement.

**b. PDPs Female Family Members in NGOs**

163. NGOs activities in Bangladesh are praised throughout world for their contribution to poverty reduction and development of savings habit. In their project implementation process, they develop savings habit and provide credit support to the families through the female group members. As of now, they are working in all the rural areas of the country. The RP implementing NGO should be asked by the PEA to integrate the target PDPs with the NGOs working in the respective areas.

**Table IV-26: PDPs Female Family Members Membership in NGOs**

| Indicators   |            | District-wise data |
|--|------------|--------------------|
| Name of district   |            | Sylhet             |
| Number of PDPs   |            | 1948               |
| PDPs families with NGO                                   |            | 385                |
| Number of PDPs female family members' membership in NGOs | GO group   | 14                 |
|  | ASA        | 108                |
|  | GB         | 78                 |
|  | BRAC       | 79                 |
|  | PROSHIKA   | 8                  |
|  | Other NGOs | 11                 |
|  | Local NGO  | 114                |
|  | Total      | 412                |

**Source:** SES conducted during July – August 2014

i. Of the total 1948 PDPs, 800 (41.07%) are within the annual income group of above Tk. 100,000 and when the upper limit goes to above Tk. 200,000 the total number become 845 (Table IV-16), which is 43.38 % of the total PDPs. This implies that there are scopes for integrating the PDPs female family members with the NGOs saving-credit activities. The 1461 PDPs who want credit support may be asked to join the NGOs for credit and the INGO may be given this responsibility for motivating the PDPs by the PEA. Thus, they can be helped in Income Restoration and Rehabilitation, an important component of resettlement.

## V. ASSESSMENT OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

### A. General

164. Improvement of the Sylhet-Tamabil road will have many impacts on the environment. These impacts on the natural environment (physical and ecological resources) and social environment (economic development and social and cultural resources) will be either adverse or beneficial. These impacts may be as direct, indirect and cumulative impacts as follows;

- i. Direct Impacts – i.e. direct impacts include the impact of construction expenditures in the local economy.
- ii. Indirect Impacts – i.e. those resulting from activities to be carried out by the Project, but not directly attributable to it.
- iii. Cumulative Impacts - i.e. impacts in conjunction with other activities. The cumulative or additive effect could be large impacts on environment.

165. Implementation of the project will cause impacts that may be either short-term or long-term. Most of the short-term and long-term impacts for the improvement of Project road will be beneficial. Short-term positive impacts will include, for example, a reduction of traffic congestion, generation of employment opportunities during construction period. Long-term benefits will include alleviation of existing traffic congestion, improvement of transport services, easier access to commercial, residential and industrial facilities; faster communications and commodity transport; improved access to markets and commercial centers, increased services and enhancement of the national trade and economy.

166. The Rapid Environmental Assessment (REA) Checklist for Roads and Highways has been used to provide the first step of environmental assessment for the proposed road project. It is a screening exercise for the identification of likely impacts attributable to the upgrading of the Sylhet-Tamabil road (Appendix-5).

167. In detail, the REA checklist identified the following impacts:

- Disfiguration of landscape by road embankments on road widening;
- Risk of encroachment on precious ecology such as sensitive or protected areas.
- Alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction sites.
- Creation of temporary breeding habitats for mosquito vectors of diseases.
- Dislocation or involuntary resettlement of people.
- Accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials and loss of life.
- Increased noise and air pollution resulting from traffic, leading from increased traffic volume.
- Increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road.
- Social conflicts between locals and migrant workers.
- Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation.
- Community safety risks due to both accidental and natural causes, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning.

168. The completed REA checklist is provided in Appendix 5. Appropriate qualitative methods were applied for determining the likely direct and indirect impacts. The impacts have been predicted in terms of their magnitude (i.e. low, moderate and high), extent (i.e. local, regional, national and trans-boundary) and duration (i.e. short-term, medium-term and long-

term) along with their nature (i.e., direct and indirect, reversible and irreversible).

169. Identification of the significant environmental indicators/parameters has been carried out based on the existing environmental condition into the following implantation phases of the project:

- Design Phase
- Construction Phase
- Operational Phase

The anticipated short-term and long-term adverse impacts of Project are as follows;

170. **Short-term Impacts** –those that occur during the construction of the Project, which can have adverse effect on land use, pollution of air and noise, impacts to quality of surface water and groundwater and other social factors. Some of these will be short-lived and without long-lasting effects. Whereas, some effects could have relatively significant impacts, such as those to utilities services, if appropriate mitigation actions are not taken. Short-term potential negative impacts can be avoided or otherwise mitigated through application of environmentally appropriate construction methods.

171. **Long-term Impacts-** these impacts include changes in land use and development patterns, local rainwater flooding and/or water logging if the Project is poorly designed. Acquisition of new lands is considered irreversible long-term adverse impacts.

172. Some potential environmental and social impacts cannot be avoided but can be minimized.

## B. Anticipated Adverse Impacts and Mitigation Measures

173. The anticipated potential adverse impacts on the existing physical environment, ecological resources, economic development and social and cultural aspects of the project area, and the mitigation measures to address them, are outlined below.

### a. Impacts on Physical Environment

#### Climate:

174. Bangladesh is one of the most vulnerable countries in the world in terms of global warming and climate change considerations. The most important factor relevant to the project is change to rainfall patterns. Due to global warming and greenhouse gas emissions, the trends of rainfall, temperature and humidity are changing. The design of the road will therefore need to take into account changes and potential increases in rainfall, temperature, and wind speed.

175. **Project Design Phase:** More intensive and prolonged rainfall was considered during the design phase and special design measures have been included in the final design.

#### **Mitigation Measures:**

- i. The road design incorporates features to withstand unusually high rainfall patterns. Design features include embankment height, pavement design, and increased size of drainage channels, Bridges and culverts to accommodate additional rainfall and potential flooding. Bridge/culverts construction will be scheduled so that they are constructed during pre-monsoon season to avoid potential hazards resulting from excessive rainfall and consequent flooding.

#### Flooding and Drainage:

176. Flooding is a significant problem during the rainy season. Flooding or drainage congestion and water logging will occur in the project area during severe rainfall in the monsoon season. The construction of a wide road embankment may have impacts on the roadway corridor. Unless adequate drainage is allowed in the embankment, the potential exists for it to act as a dam, impounding rainwater in the vicinity of the roadside and settlement areas. Therefore, methods to reduce flooding caused by the road development will need to be incorporated into construction and operation phases of development.

177. **Project Design Phase:** Design features have been incorporated into the final design to ensure that no flooding is worsened within the vicinity of the area and preferably reduces flooding. Construction of bridges and culverts will cause adverse impacts on the quantitative aspects of surface water hydrology as follows:

- Surface water drainage will be impeded by the construction of the bridge end body and approach roads embankment,
- Periods of flooding may last longer due to the impeded drainage and back water effect.

**Mitigation Measures:**

- i. To prevent any worsening of flooding, a detailed investigation on surface drainage/hydrology of catchment areas has been considered and accordingly drainage for the road has been designed to minimize the impact on drainage and flooding. Further detailed study will be conducted during implementation of the project
- ii. Regular cleaning of channels to avoid choking.
- iii. Provision of adequate cross drainage structures to easily drain off water to canals and other lowland areas;
- iv. Ensure that storm water drains and highway drainage systems are periodically cleared to maintain storm water flows during construction.
- v. Provide sufficient pipe culverts, box culverts and bridges on the road with adequate opening for cross drainage of the catchment area, so that they can safely handle a 50-year frequency of flood
- vi. All drains need to be designed so that runoff resulting from storms at a specified frequency of occurrence can be drained off immediately without overflowing or without being impounded in lower elevations of the project area.
- vii. The elevation of the road surface should be designed so that it can shed water as quickly as possible during heavy rain. Standing water is a serious hazard to traffic and would eventually penetrate through the surfacing into pavement and to the sub-grade layers reducing their stability and life.
- viii. Formation level of the embankment for any large bridge should be above the 50 years flood level by a free board of at least 0.6m.

178. **Project Construction Phase:** The existing surface water hydrology, ground water flow and water management practices are usually interrupted by major earthworks. During the construction, permanent and temporary works, such as construction site, labor camps, project office stack-yards, construction materials stockpiles and dredge spoil stockpiles, etc. may be built. These works could potentially disrupt the natural cross drainage and might be the cause of flooding, which may have localized or regional impacts. Furthermore, the excavation of fill materials for construction of road embankment will result in an increased extent of open water during monsoon.

**Mitigation Measures:**

- i. To prevent water logging of terrain surrounding fill areas, temporary drains should be constructed around the embankments to ensure water can flow (by gravity or pumped) to the river.
- ii. A drains and pipes should be designed so that they can safely handle a 50-year frequency of flood.
- iii. For bridges the river morphology should be examined to determine effects on river bed and banks erosion and etc.
- iv. To save the public and road users from this unwanted worsen situation of water logging, a proper maintenance of drainage system should be considered from

beginning of the Project.

179. **Project Operational Phase:** Proper maintenance and supervision of drainage infrastructure should be included into the executing agency activities.

**Air Pollution:**

180. Air pollution and dust pollution may arise from clearing and dismantling obstructing physical structures, earth works, vehicle emissions, and from other construction associated activities during the implementation phases of the project. The impacts become more significant in the urban areas where construction activities are more constrained and where more people may be detrimentally affected.

181. **Project Construction Phase:** Air quality impact during the construction phase of the project will occur due to fugitive dust generation in and around the construction activities and from equipment such as plants for crushing rocks, hot mix, asphalt plants, etc. Dust generation will occur during dismantling or demolition of existing physical infrastructure, such as bridges/culverts divider/median, island, and other amenities developed on the roadsides within construction site.

182. During site preparation the project area will be affected by traffic emission from the existing traffic movement and movement of construction vehicles and equipment. Removal of trees and vegetation will create dust and more pollution at the site.

183. During the construction of the road local air quality in and around the construction site is likely to be degraded by exhaust emissions from operation of construction machinery, fugitive emissions from concrete, asphalt and aggregate plants, and burning of bituminous and other materials. In addition to this, dust is generated from excavation, exposed soils, earth works, material stockpiles, crushing and handling of aggregates which will all pollute the local air quality. Indiscriminate burning of solid waste during the construction period of the project will also deteriorate air quality at the construction site.

**Mitigation Measures:**

- i. Contractor should submit a dust suppression program to RHD prior to commencement of civil works.
- ii. Ensure maintenance of construction material carrying vehicles is carried out to a high standard.
- iii. Emissions of air pollutants from construction machinery can be prevented by proper maintenance of the machinery, construction equipment to a high standard.
- iv. Spraying of water on the roadways and other dusty surfaces should be done during the dry season.
- v. Ensure asphalt and cement mixing activities are in compliance with Environmental Conservation Rules (ECR),1997.
- vi. Cover stockpiles during dry and windy weather and cover vehicles/ trucks carrying construction materials when passing through market areas and urban and residential areas.
- vii. Cutting of soil and subsoil must be undertaken in accordance with ECR, 1997.
- viii. Ensure consultation with community and reporting and complaint system established.

The above mitigation methods will be included in the environmental specifications of the contractors' contract.

184. **Project Operational Phase:** It is anticipated that there would not be significant impact on air quality during operational phase if proper mitigation measures are adopted.

**Mitigation Measures:**

- i. Roadside tree planting can limit some harmful impacts of dust and vehicle emissions.
- ii. Ensure good quality paved road during the operational phase through proper maintenance to reduce vehicle emissions.

**Noise Pollution:**

185. The potential noise pollution will be generated during the construction activities and by vehicles operating on the road during the operation phase.

186. **Project Design Phase:** Design Engineers can adopt some noise mitigation methods to reduce noise impacts to sensitive uses near the selected alignment.

**Mitigation Measures**

- i. Ensuring design avoids sensitive uses.
- ii. Permanent noise barriers have been designed and will be constructed at the noise sensitive receptors like road side schools and religious places like Mosques identified during the environmental survey to reduce potential noise impacts at sensitive locations
- iii. Noise barriers should be incorporate in detail designed and the contractor as early as possible to reduce potential noise impacts to sensitive uses.
- iv. Locate rock crushing, hot mix plant, concrete mixing and material shipment yards away from residential areas, schools, colleges and hospitals.
- v. Install temporary noise barriers near sensitive locations such as schools, religious places and hospitals
- vi. Alternate construction methods or temporary barriers can also be constructed to lessen potential construction noise impacts (i.e. cast-in-place piles rather than driven piles during bridge construction, rubber-tired equipment rather than steel-tracked equipment, etc.).

187. **Project Construction Phase:** Due to the construction activities, the noise levels are likely to increase significantly in the Project area. Noise is generated primarily from the use of machinery such as excavators, rollers, rock crushing, and generators. Although the generation of noise levels in construction phase will be temporary, it can be detrimental to health and wellbeing.

**Mitigation Measures:**

- i. **Source Control**–use of new and well-maintained vehicles and equipment with appropriate noise abatement measures.
- ii. **Site Control**- measures to abate construction noise can modify the time, place, or method of operation for a particular noise source. The measure most often utilized is the limitation of work hours on a construction site. Careful project planning can aid in locating noisy construction activities as far as possible from sensitive receptors or in areas where natural shielding is possible. Building temporary noise barriers or special equipment enclosures is usually expensive and limited to use only in instances of severe construction noise impacts.
  - Noisy elements, i.e., compressors, stockpile operations, haul roads, etc., can be located in less sensitive areas.
  - Use of any existing natural or artificial features, such as stockpiles, that can shield the construction noise.
  - Limit working hours of construction and equipment machinery with acoustic shielding or mufflers. Limit noise at boundary of construction site to 60dB during day and 50 dB (A) at night. If these levels cannot be maintained, and if there are complaints from surrounding people, sound barriers should be built.
- iii. **Sensitive noise receptors**- Equipment producing high levels of noise should be suppressed when working within distances of 200 meters from any sensitive receptors, such as schools, religious buildings, mosques or other community facilities.
- iv. **Community Relations**- Early communication through consultations with the general public is vital. Inform the public of any potential construction noise

impacts and measures that will be employed to reduce these impacts. Establish and publicize a responsive complaint mechanism for the duration of the project. The establishment of good rapport with the community can provide high benefits at a low cost.

188. **Project Operational Phase:** It is anticipated that a good geometrically designed road with high quality pavement and smooth surfaces will reduce noise levels and reduce the need for regular use of horns.

**Mitigation Measures:**

- i. Regular maintenance of the project roads will be undertaken.
- ii. Construction of noise reduction barriers at sensitive areas such as schools and mosques should be considered.

**Topography and Soil Pollution:**

189. Adverse impacts on the topography /landscape of the project area and deterioration soil quality may occur. The topography becomes undulating and hilly terrain at Jaintapur in Tamabil road section, where special design requirements may be needed. Extraction of construction materials and soil pollution will need to be considered.

190. **Project Construction Phases:** The local landscape may be disfigured through the excavation of spoil materials for the road construction and the construction of the 4-lane road itself.

191. Extraction of spoil for filling and other construction activities may cause soil pollution. If bentonite mud is used as a drilling fluid to stabilize the boreholes/ piles, the improper disposal of bentonite slurry may pollute the soil quality.

**Mitigation Measures:**

- i. During dismantling and demolition of physical structures existing land-use will be degraded. Contractors should be responsible for the restoration of lands /roadsides /footpaths to their original state.
- ii. Contractor to submit a spoil plan to RHD which will include reference to measures be undertaken during rehabilitation of landscape.
- iii. Oil and liquid waste must be disposed of in approved sites to ensure no soil contamination takes place.
- iv. Replanting of trees along the roadways should be carried out. Trees will enhance the landscape in the medium to long term and will make the roads into a positive feature once the trees and flowers are established.
- v. Proper disposal of bentonite slurry during boring the pile should be considered to protect the soil quality.

192. **Project Operational Phase:** Improper disposal of waste can cause soil contamination.

**Mitigation Measures:**

-Ensure all wastes from the road are disposed of in approved sites.

**Surface Water Pollution:**

193. The quality of surface water may deteriorate due to uncontrolled discharge of liquid effluents and solid wastes directly into the nearby surface water bodies during the construction phase of the project.

194. **Project Construction Phase:** The surface water quality is liable to deteriorate if the effluents from the Project's offices, housing facilities and labour camp are improperly disposed of directly into nearby rivers or water bodies. Another cause of water quality deterioration may occur due to dredging activities for fill materials for road embankments. Dredging itself and the discharge of effluent from the hydraulic fill areas will cause an increase in the suspended sediment load of the river and increase turbidity, posing a potential threat to aquatic organisms downstream. Increased turbidity in water reduces light

penetration, thereby interfering with the photosynthetic process. Dredging disturbs the thin layer of oxidized sediments at the river bottom; it will expose and disturb the deeper non oxidized layers. The removal of the un-oxidized material may result in high values for chemical and biological oxygen demand in the surrounding waters.

Sources and/or activities that may have impact on surface water quality are:

- discharge of wastewater and toilet effluent directly into the river and on the land without proper treatment,
- disposal of solid waste into river or nearby any water body,
- discharge of effluent from offices and labour camp,
- spilling of fuel, lubricants and other liquids used in the use of machinery,
- discharge of effluent from hydraulic fill and stockpiling of dredging spoil into river or wetlands.

#### **Mitigation Measures:**

- i. Disposal of solid and liquid wastes directly into surface water body should be prohibited and implement controls on handling the chemicals,
- ii. Dredged spoil should be reused as much as possible instead of being dumped in the river
- iii. If disposed in the river, the dredged material is to be released near the bottom, in order to minimize the spatial extent of increased turbidity and sedimentation.
- iv. The effluent of a hydraulic fill may contain high concentrations of suspended sediment, causing increased turbidity in the receiving waters. The concentration of suspended sediment in the effluent from the dredged material, discharged into natural or existing water courses, should not exceed 4,000 ppm.
- v. If bentonite mud is used as drilling fluid to stabilize the boreholes/ piles, the disposal of bentonite slurry should be done in such a way that the solution does not pollute soil or surface water. Direct disposal of this slurry into water body should not be allowed. Drainage of this wastage into water bodies should be controlled through the collection of bentonite slurry in confined storage drum /or preparation of small settling impermeable tanks near the site. The settled slag from the bottom of the drum/ tank should be taken off weekly and disposed of as sanitation land fill material or fill material for the road embankment. The decanted wastewater from the tanks can be allowed to pass into the surface water after testing the pollution level of the wastewater. More investigation to determine the actual pollution level of the bentonite solution should be carried out.
- vi. Care should be taken not to pollute river water during concrete work, from cement slag and from spills of oil / fuel, by providing diversions and other measures appropriate to the specific site.

#### **Groundwater Pollution:**

195. **There** are a range of anticipated impacts on groundwater quality which are directly related to the construction activities of the project.

196. **Project Construction Phase:** Generally, the common impacts on groundwater are caused by the actual construction activities, labor camps (water and sanitation), haul routes, use of polluted water, waste generation, fuel storage etc. Accidental spillage of toxic chemicals such as fuel, lubricants, thinner and solvents may also contaminate the ground water system through infiltration. If soak pits are used in the waste water disposal system, the ground water quality is likely to be affected by the effluents. Also, leachate generated at the solid waste disposal site may contaminate the ground water system.

#### **Mitigation measures:**

- i. Provide sanitary latrines in the construction camps and sites and to be located at a safe distance from hand tube wells in the construction sites, camps and Project office.
- ii. Accidental spillage of toxic chemicals such as fuel, lubricants, thinner and solvents

during construction works should be eliminated.

- iii. All wastes and effluents to be disposed of offsite in accordance with existing regulations.
- iv. All solid waste from project offices and labour camps should be disposed of at approved off site locations.

197. **Project Operational Phase:** It is expected that in operational phase there will be no scope for deterioration of groundwater quality provided spillage from accidents are managed properly.

### **Seismology:**

198. The Project roads pass through the Seismic Zone-4 of Bangladesh and there is a moderate risk some impacts.

199. **Project Design Phase:** Although unlikely to occur, seismic activity could have a significant effect on structures located along the road, particularly bridges.

### **Mitigation measures:**

- i. Earthquake resistant design parameters for roads, bridges and culverts should be carried out in accordance with the seismic zoning as set out in the Bangladesh National Building Code(BNBC),
- ii. Ensure appropriate Design of the foundation of piers and superstructure of bridges and culverts according to consideration of earth quake hazards

### **Borrow Pits and Haul Routes:**

#### **Borrow Pits**

200. Borrow pits will cause disturbance to local environment, particularly dust and noise. The excavation of borrow pits, if not refilled, will permanently increase of the extent of open water, resulting the loss of agricultural lands, creation of breeding ground for mosquitoes and water-borne and water related diseases. The impacts related to the creation of borrow pits can also have positive impact: there will be opportunities for aquaculture.

#### **Mitigation Measures:**

- i. Borrow pits should only be selected in full consultation with the local community and RHD.
- ii. Sites selected should preferably not be in agricultural use.,
- iii. After use the borrow pits should be filled in with dredged material or reclaimed in order that they can be used for aquaculture or recreational use;

#### **Haul Routes**

201. The transportation of fill and other material from their source can cause significant impacts if long distances are involved. Even distances of a few easonally will require large numbers of trucks and the use of existing or specially built roads.

Haul routes for fill and other material can cause

- Noise and air pollution,
- Danger to other road users, particularly pedestrians and non-motorized and farm vehicles,
- Disturbance to agricultural activities.

#### **Mitigation Measures:**

- i. All borrow pits and haul routes to be agreed before start of work
- ii. Borrow pits closest to the construction sites should be selected.

### **Use Of Construction Materials:**

#### **Filling materials**

202. Constructions of road embankments generally use earthen materials from borrow pits adjacent to the road alignment or are imported from nearby sites. The lands that are used for

borrow pits become barren or abandoned and can no longer be used for agricultural production.

#### **Mitigation Measures:**

- i. Minimize the use of earth/ top soil as filling materials for road embankment
- ii. Maximize the use of dredged materials as filling materials
- iii. Use clayey soil instead of top fertile soil from clearing and grabbing operation for using as cladding layer.
- iv. Borrow pits can be rehabilitated and used as cultured fish ponds after excavation.
- v. The detailed impact of the source of construction fill-materials such as soil and sand (course and fine) from different sources needs to be assessed.

#### **Other materials**

203. Improper collection and use of other construction materials such as Rock/ Boulders (stone aggregated), Clay Bricks, Cement, Steel, Bituminous materials, Anti-stripping chemicals, etc. can cause significant impacts on the environment. The investigation on the sources, quality and available quantity of construction materials are being carried out by the consultants. The samples from the different sources of basic and major materials are being collected and laboratory tested, and yet to be decided for recommendation. The probable sources and impacts on the sources due to collection and uses of materials will be assessed in terms of environmental point of view during the detailed design stage.

#### **b. Impacts on Ecological Resources**

##### **Fisheries and Aquatic Biology:**

204. Rivers in Bangladesh are an important migration route for a wide variety of fish, between their spawning grounds upstream and the sea. Generally, fish tends to migrate laterally onto the floodplain to spawn and feed; this takes place during the periods of flood. The backwater effect may even cause more of the upstream floodplain to be flooded during the wet season, providing additional spawning grounds to fish.

205. Construction work on bridges, especially the pile driving, may affect this migration of fish. If pile driving continues over a prolonged period of time this may affect the migratory behavior of fish and other aquatic animals and plants or phytoplankton. During construction phase the use of oils, dispersants, lubricants or any other chemicals that may pose a threat to the fish resources, may require specific handling procedures.

206. Additionally, to ensure that there are no harmful impacts on the aquatic biology it will be essential that construction waste and effluent is not disposed of in exiting water bodies. Benthic organisms, if present, may be disturbed by piling activities in the river, canals and or any water body.

207. **Project Construction Phase:** The pollutants may enter the river water and or other water bodies potentially from dredging operations, from accidental spills, and from the discharge of effluents from project offices, construction sites and from labour camps. During the construction of bridges, the increased turbidity in the river due to dredging activities (if necessary) and the discharge of dredge spoil effluent may affect aquatic life in the river. This could be detrimental to the fish and aquatic biology of the project area. Furthermore, due to locally increased turbidity in the water bodies, light penetration will be reduced, interfering with the photosynthetic process, which will affect the aquatic habitants.

#### **Mitigation Measures:**

- i. Fish migration route and spawn seasons should be considered during construction works to control the damage of the fish resources.
- ii. Attention should be given to adverse impacts on fisheries and monitor the fishing production, if possible, limit the construction works in the monsoon season.
- iii. Investigate alternatives for pile driving for the construction of the bridge's substructure (bored piles).

- iv. Control accidental spills and ensure proper discharge of effluents from project offices, construction sites and from labor camps into the surface water,
- v. Disposal of dredged material should only take place in the deepest section of the river, minimizing the impact on river transport and on aquatic benthos (organisms living in or at the river bottom).

### **Wildlife (Fauna) Including Rare and Endangered Species (Fauna):**

208. The project road does not pass through any natural forest or conservation areas but passes through urban, semi urban and rural areas. The works for the widening of roads, construction of bridge/ culverts and the subsequent operation of the transport system is not expected to create any additional threat to species diversity or the subsistence of (endangered) species. The baseline data pertaining to wildlife, specific for the road alignment, is not available at this moment. Loss of existing trees in the project area is likely to represent a loss of bird habitat in the short-term during construction phase.

209. Therefore, the zones to be affected by the works are not known to accommodate any valuable or sensitive ecosystems. Although, most of the sections alongside the Project road are occupied by agriculture lands, borrow pits and or wetlands, and when widening the project roads will not be any significant impacts on wildlife, except some localized impact during construction phase.

210. Project Construction Phase: There will be disturbance to birds and other small animals during the construction phase. This may affect breeding habits and significant movements of birds away from the construction sites.

### **Mitigation Measures:**

- i. Hunting of birds and other animals should be banned at the construction sites
- ii. No disposal of construction and other waste allowed into forest areas.

### **Trees and Vegetation (Flora):**

211. Widening of the 2-lane project road to four lanes will require felling the existing planted roadside trees and homestead trees outside the ROW if realignment is necessary. Most of the trees and vegetation, now present in the affected stretches of lands are within the present RoW, but most will outside of the RoW.

212. It has been estimated that a significant number of small (less than 30 cm girth at waist height), medium (30-60 cm girth at waist height), and large (over 60 cm girth at waist height) trees from Sylhet-Tamabil roadsides may be felled during the construction phase. Tree felling will affect timber and bio-mass production potential directly at local level. Ecological impacts can be reversed planting site specific tree species as per the directives of Social Forestry Act (2004).

213. Any loss of trees will impact on other flora and may affect wildlife, particularly birds and mammals that rely on trees their food source. In addition, the loss of trees may increase soil erosion.

214. Apart from trees and undergrowth other vegetation affected will be agricultural crops, bamboo bush and other native vegetation. Excavation of borrow pits will add to the destruction of flora.

215. **Project Construction Phase:** The local terrestrial ecosystem will be significantly affected by removal of roadside trees. Dust produced by vehicle movement and construction related activity (e.g. asphalt plant) will settle on plants and crops which will contribute to their deterioration. Also, emission from the construction material carrying vehicles exhaust will settle on surrounding vegetation, which will create localized damage to terrestrial vegetation including disturbance of natural habitat environments. Aquatic vegetation will also be disturbed due to the pollution of surface water, mainly constriction of culverts and bridges, spillage of chemicals, run off the wastewater, disposal of solid and liquid waste into the water body. Furthermore, pavement work may cause air pollution to the surrounding flora; this

in turn may lead to decreased agricultural production during execution of the works.

#### **Mitigation Measures:**

- i. No trees shall be felled unless they are directly in the path of the project road and clearly defined, or unless they created a safety hazard to the future operation of road.
- ii. Upon completion of embankment works turfing and planting should be done on embankment and slopes. Dense and well rooted growth of permanent grasses should be planted to eliminate dust and erosion.
- iii. Replanting along the roadway, should consist of a multi-species mix of local vegetation including fruit trees, fast growing (fuel) trees and timber trees: see suggested replacement trees listed below.
- iv. Replanting of trees along the road side can be done through implementation of Social Forestation Program by NGO-RHD. It will offer a significant opportunity to bring benefits to the local community and to Project Affected Persons (PAP's), vulnerable groups, particularly women by direct involvement in the program.
- v. Forestation programmes should be initiated, covering the road RoW, any embankments, and land near bridges and culverts to compensate for the loss of vegetation, to reduce the risk of erosion of the banks, and finally as a noise reducing wall.
- vi. Request the Contractors to protect the vegetation adjacent to the RoW to ensure that no wood is used as fuel wood for heating bitumen.

#### **Replacement Trees:**

216. The Department of Forest (DoF) recommended tree species e.g. mahogany (*Swieteniaspp.*), silkoroi (*Albiziaprocera*), ipilpil (*Leucaenaleucocephala*), neem (*Azadirachtaindica*), sonalu (*Cassia fistula*), raj koroi (*Albiziarichardiana*), khejur (*Phocnixsylvestris*) and others at road sides and bridge approaches will improve ecological condition at project command area.

217. Species like kadam (*Anthocephaluschinensis*), jarul (*Lagerstrocmiaspeciosa*), pitali (*Trewianudiflora*), hijal (*Barringtoniaacutangula*), mandar (*Erythrina spp.*), easo (*Crataevanurvala*), karaj, simul (*Bomboxceiba*), palash (*Buteamonosperma*) can be planted in lower part on road side. These species bear flower and flood tolerant hence, will improve road side beauty. Palmyra palm (*Phoenix*), date palm can be planted on lower part of road and/or approach road sides.

218. The objectives of highway side tree planting are (i) to augment biological resources e.g. biomass energy, timber, medicinal plant, food and fodder and raw materials, (ii) to enhance aesthetic beauty of the highway, (iii) to ensure embankment protection from gully erosion during monsoon to (iv) augment raw materials production for industries including cottage industry, (v) to support biological diversity particularly for birds and (vii) create employment for the poor for poverty alleviation. Care should be taken that under no condition the road side trees obstruct traffic movement the main use of the highway.

#### **Protection of Hill Cut Sites**

219. Hill cutting for fill material collection or for highway embankment construction is strictly prohibited under the provisions of Hill cutting Law (1986). Moreover, hill cutting in high rainfall zone like EHR will accelerate gully erosion and damage crops on adjacent lands in plains depositing the erosion products. Hill slopes at cut sites will be prone to landslides threatening traffic flow on highway as observed in some section in Jaintapur every monsoon. The situation should be controlled either by constructing retaining walls, creating biological fences across the hill cut slopes or any other devices.

#### **c. Impacts on Economic Development**

##### **Land use:**

220. The development of the road is likely to encourage a significant growth in all forms of

legal and non-legal urban development particularly uses connected with transport of goods and people; for example, CNG stations, bus stops, restaurants etc. Where the road follows a new alignment different to the present alignment more development will occur and may ultimately affect the flow and efficiency of the new road. Where the road passes through existing urban areas and where new alignments reselected areas not suitable and suitable for development must be defined by the RHD and effectively implemented.

**Disruption of Agricultural Activities:**

221. Within the Right of Way existing agricultural practice will be stopped permanently. As a result, agriculture production from the acquired lands will be lost for irreversibly. Agricultural land outside the existing designated areas (RoW) may be adversely impacted if new land acquisition or requisition (construction period) is required, the production reduced or temporarily stopped during the construction period. Earthworks and drainage works may temporarily affect production. Dust originating from the work site will also influence agricultural production in a negative way. In many cases a return to full production may take many seasons.

**Mitigation Measures:**

- i. Proper compensation should be provided to the PAPs.
- ii. Water logging should be controlled through maintaining the cross-drainage facility in the project area.
- iii. Arable lands not to be used for earth borrowing stock piling etc.
- iv. Control the dust nuisance through implementation of Dust Suppression Plan (See Air Quality section).

**d. Impacts on Social and Culture**

**Displacement of Legal and Illegal Occupants Within Row:**

222. There will be significant displacement of legal and illegal occupation of the land required for these roads. An initial census was undertaken as part of the preparation of the Resettlement Framework in 2014, and the final census is currently underway as part of the preparation of the Resettlement Action Plan (RAP). Displacement or relocation of PDPs will lead to an enormous disruption of social life and livelihood in the local population.

**Mitigation Measures**

- i. Under the RAP, the PDPs (title and non-title holders) and vulnerable people will be properly addressed and compensated for their asset lost, loss of wage days etc. should be considered as per GOB Rules and Donor Agency Guidelines.
- ii. According to the Resettlement Framework, proper compensation and rehabilitation of the vulnerable PDPs is needed.
- iii. Compensation entitlement matrixes for the directly affected persons will be formulated in the RAP, which will include loss of income from the tangible asset of legal and illegal occupants, loss of income from loss day-wages, street vendors, and footpath shops and other vulnerable business, etc.

**Health and Education:**

223. Some health and education uses are located within or close proximity to the existing RoW and will need to be partially or completely relocated. Full notification and compensation must be paid to these uses. A full list of uses close to the ROW is included in Appendix-3.

**Cultural Heritage and Realigns:**

224. Some mosques and temples are close to or are within the proposed ROW and will need to be partially or completely relocated. Full notification and compensation must be paid to these uses.

225. No known or recorded archaeological, historical or architectural structures or sites are affected by the road development. Any archeological remains discovered or unearthed during site preparation or construction is to be recorded by the Department of Archeology.

Construction may need to be temporarily stopped for this to be carried out. A full list of sensitive cultural uses close to the ROW is included in Appendix -3.

### **Indigenous People Use of Land:**

226. There are some Monipuri, Khasia indigenous people living in the Sylhet region, but they may not be directly affected by the road development. The initial census of PDPs undertaken in 2014 did not identify any indigenous people, but particular attention will be paid to potential impacts to ethnic minorities in the RAP.

### **Occupational Health and Safety:**

227. Apart from being exposed to the risk of accidents, the construction workers may also be at risk for occupational health hazards due to the materials handled and working conditions. Under occupational health hazards one can group several categories of working conditions impairing the health conditions of workers, though this impairment is slow. Safety relates more to health hazards that result from (sudden) accidents and cause an instantaneous impairment of the worker's health.

228. Usually, the labor camps will be constructed for accommodation for large number of workers. Given high concentration of people, the potential for diseases and illnesses to be transmitted will be increased. Poorly designed sanitary facilities may contaminate the soils and water quality, and improper disposal of garbage, rubbish and construction waste may pose a health threat and nuisance to the workers. Uncontrolled vending of food on the work site may also pose a risk with respect to the transmission of contagious diseases. Construction workers may be required to handle hazardous materials, therefore, increasing health risk. Additional impacts may arise from inadequate Health and Safety practices on site. This could impact on either construction workers and project personnel or the general public and is particularly significant given the labor-intensive construction methods that are employed. The excavation of borrow pits (if necessary) for the collection of filling materials of approach road embankment will result in a large extend of open stagnant water. This will lead to an increased extend of breeding ground for mosquitoes and other water-borne diseases. Furthermore, sexual practices and prostitution may cause the spread of sexually transmitted diseases.

229. The use of chemicals (e.g. paint, thinner and solvents) in the fabrication and finishing of the bridge may be carcinogenic, or detrimental in other ways. E.g. the use of industrial solvents can cause anemia, liver and kidney damage, cardiovascular diseases and neurological disorder. Benzene, phenols, and carbon tetrachloride are examples of products widely used, but which are also dangerous to health. Other health problems can be caused by inhalation of exhaust gases from vehicles and machinery which can impact lungs, eyes and skin, etc.

230. The health effects of noise and vibration can be significant; noise contributes to hearing loss but also triggers physiological and psychological body changes. The cardiovascular, endocrine and neurological functions are the most affected. Vibration can be a serious form of stress, causing anemia and lesions in the gastrointestinal tract, resulting in internal hemorrhaging. These impacts are related to potential health problems, undesirable social conditions and pollution of the environment.

231. The activities causing the occupation health hazard and safety can be described as follows:

- Construction and functioning of labour camp, construction sites, project offices
  - Poor living conditions of workers
  - Improper housing facilities for construction of labor camps
  - Lack of sanitation facilities in project office, construction site, and construction camps
  - Lack of drinking water facilities
  - Lack of proper solid waste collection and disposal system
  - Uncontrolled vending of food
  - Sexual behavior

- Storage of materials and equipment
- Handling of equipment and chemicals

### **Mitigation Measures:**

#### **Working Site:**

- i. A reduction of the risk of accidents can be achieved through strict rules and procedures for the execution of specific tasks, enforcement of these rules, discipline amongst, and proper training of the work force, maintenance of equipment and machinery used and by providing all gear or equipment that may enhance the safety of the workers.
- ii. Personal protective equipment (PPE) such as helmets, protective clothing, hand gloves, life vests for those working on or above the river, etc.).Should be provided to the all workers and personnel.
- iii. Where appropriate, strict work procedures and guidelines are to be defined for the different jobs; the laborers should be informed about these procedures and guidelines; regulations are enforced.
- iv. Work with volatile toxic chemicals should be done in a well-ventilated place or in the open-air.
- v. Labourers using aggressive toxic chemicals should be provided with and forced to use protective clothing.
- vi. Workers exposed to an excessive amount of noise should be provided with protective gear and be relieved frequently from their post.
- vii. Workers exposed to large amounts of dust should be provided with adequate protective gear.
- viii. Handling of volatile chemicals and dangerous/toxic substances is to be performed by well-trained staff only.
- ix. Labourers should be trained in the proper performance of their job.
- x. Employees should know the potential hazards facing them; workers have to be informed about the potential dangers/hazards, if any, related to their work.
- xi. Proper planning, provision of adequate facilities and strict compliance with procedures and guidelines could prevent, or at least minimize the adverse impacts.
- xii. Adequate housing for labourers is to be provided with good facilities for washing, bathing, toilet and cooking.
- xiii. A safe and reliable supply of water is to be provided. The most suitable source for such a supply would probably be ground water from a deep tube well. The water quality should meet the EQS for drinking water. Therefore, treatment of the water may be required, e.g. to reduce iron and/or arsenic concentrations.

#### **Hygienic Condition**

- i. Apart from occupational health aspects, also health aspects related to hygienic conditions and behavior are to be considered.
- ii. The execution of a large-scale project brings together a large number of people that do not always live under the most hygienic conditions. This may lead to the occurrence and spreading of contagious diseases.
- iii. The Employees are to be subjected to pre-employment and regular medical examinations, as well as tests and analyses necessary for the detection of a disease.
- iv. The adverse impact that may occur if insufficient precautions are taken is the development of slum conditions in the housing area of the labourers, with

subsequent insalubrious living conditions, social stress and risks of polluting the surroundings by solid waste, effluent, drainage congestion/ Inadequate drainage, etc.

- v. Hygienic sanitary facilities and sewerage system are required. Each living unit should possess a water sealed toilet and bathing facility. Waste water is to be discharged by providing each cluster of living units with septic tanks, connected with soak pits or absorption trenches.
- vi. In planning the location of the living quarters of workers on the project, the houses should not be located in the direct vicinity of noise producing activities. For this aspect the standards as described in section on noise pollution should be taken as reference

### C. Land Acquisition and Resettlement

232. In most locations along the road, the existing RoW is inadequate to accommodate the necessary design cross-section width of a 4-lane dual carriage with additional adjacent SMVT lanes. Additional land is therefore necessarily to be acquired for the upgrading of the road. A reasonable assessment has been made, as part of this Study, of the total land area necessarily to be acquired. Land acquisition plans with detailed plot schedules are included by the Consultant in the detailed design phase of the project road.

### D. Cumulative, Indirect and Induced Impacts

#### a. Cumulative Impacts

233. The ESIA has indicated that though there will be some manageable operational impacts, assuming effective implementation of the mitigation measures and monitoring requirements, the Project is not expected to have significant adverse environmental impacts during the operation phase. The most sensitive impacts are contamination of surface water, soil and groundwater during construction and operation and uncontrolled waste disposal that could affect adjacent areas. This must be regularly monitored, mitigated and managed to ensure no adverse impact within the road corridor.

234. Since this road is a comparatively isolated road, no other major road developments occur in this road corridor. However, these will be completed prior to the construction and operation of the Sylhet-Tamabil Road, and cumulative impacts of major projects are unlikely to be an issue. The scale and nature of smaller urban development (public and private sector) is difficult to determine but is not likely to be significant.

235. There may be some short- and medium-term reductions in noise and improvements in air quality. The widened road, particularly in the present more congested urban sections together with the improved road surface, will reduce congestion. This will have the impact of encouraging a more regular and uniform speed of 60-70 km per hour. With the same traffic flows at this increased speed, emission levels and noise levels will be reduced. However, the projected increase in traffic flows may have the impact of increasing the overall vehicle emissions and noise levels.

#### b. Induced and Indirect Impacts

236. The improvement of a road from 2-lane to 4-lane is likely to have a significant impact on the development potential and opportunities along the road corridor. The improved vehicle speeds and travelling time along the road corridor from Sylhet to Tamabil will encourage a growth in economic activities in various sectors including the export industry. This growth in economic activities will encourage more development along the road and adjacent corridor. Industrial, commercial and residential development is likely to grow significantly as a direct result of the improved road and reduced travelling distance.

237. Increased development is likely to result in increased effluents, solid waste, and noise and air pollution. At this stage, it is not possible to determine the scale of induced development. The potential adverse environmental impacts are also at this stage not possible to predict.

## E. Analysis of Alternatives

### a. General

238. The road alignment is predominantly rural for most of its length though there are some urban uses and development at the township of the district and major road intersections (commercial and parking area). In order to widen the carriageway some encroachment of adjacent agricultural land will be necessary, and this will need to be strictly managed during the construction phase. This is an existing road and there is likely to be cuttings of many roadside trees and vegetation. In addition, the social/resettlement issues are likely to be substantial in many areas where there are villages and markets adjacent to the road. Since the Row is probably wide enough for 4-lanes, there may be less significant land acquisition resettlement problems at the market locations. There are a number of sensitive uses near to the project road such as ecological critical area, schools, temple, graveyards and other sensitive structures alongside the alignment. Some localized problems may occur and special management will be necessary during the construction phase.

239. **Commercial and market areas:** Alternatives are widening, bypass, or overpass. A few sections of alignment pass through Bazar (market) and commercial areas. The present development does not allow any widening of the present carriageway without detrimentally affecting adjacent land and buildings and allowing commercial and other activities to continue and prosper. There are a number of options:

- i. **Widening of ROW** to allow 4-lanes and any necessary junctions with demolition of commercial areas: This would detrimentally impact on the commercial health of the area and cause significant disturbance. It would also increase danger to pedestrians and other road uses; faster speeds etc.
- ii. **Foot over bridge:** given the type of road, the traffic flows and the characteristic of the local environment foot over bridges would be an option.
- iii. **Bypass:** This is one solution but would cause irreversible land loss and disturbance to agricultural land and farmers but should be considered for the larger centres. The existing residence/ commercial area may be adversely affected by loss of livelihood/ trade.

240. **Widening of RoW:** Widening of existing road could adversely affect the residential and commercial viability as well cultured ponds, haors which are developed alongside the road. This will cause major disruption during the construction stage. In some sections may still require some land acquisition if existing RoW is not enough for the construction of 4-lane.

241. This option may have advantages over widening and extensive land acquisition, and resettlement. However, it would reduce the environmental quality of the land and building below the flyover and may still require some land acquisition and resettlement.

### b. Potential Bypass Alignment

242. One new Bypass alignments have been proposed by the Highway Engineers for the Sylhet-Tamabil Road in the Feasibility Study process at 272.3km-276.5km to avoid the Jaintapur built area.

### c. Bypass Alignment at Jaintapur Bazar, Sylhet

243. The existing road section from at 272.3km-276.5km zigzags with sharp bends and passes through an important commercial centre as well as residential area in Jaintapur Figure V-1.

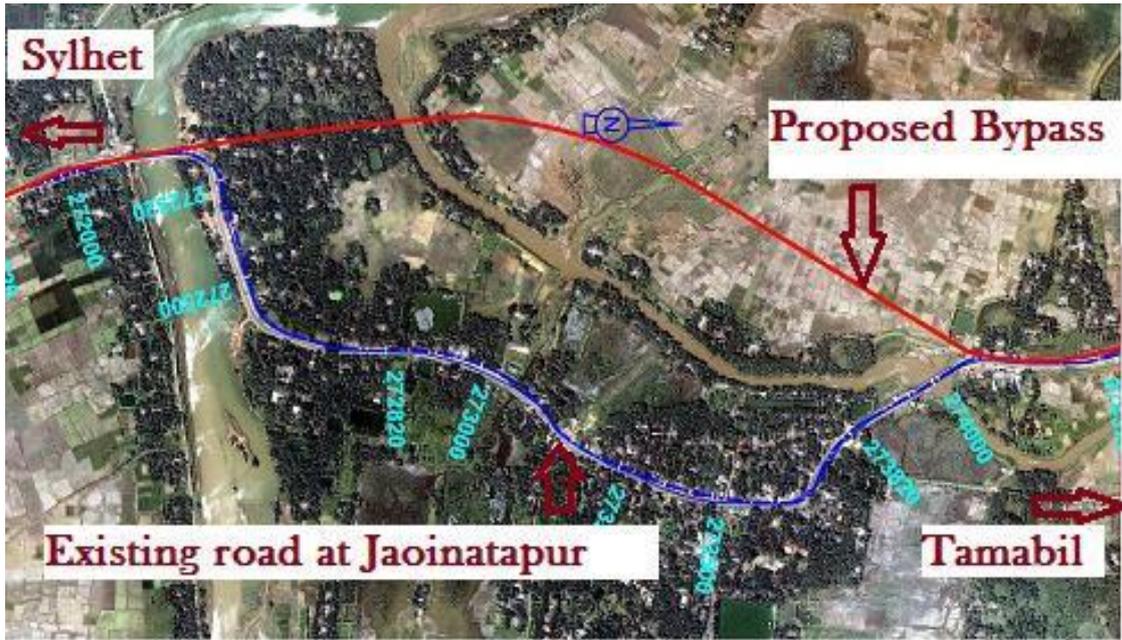


Figure V-1: Proposed Bypass at Jainatapur

244. Widening and realigning the existing route will affect a number of shops, markets, institution, commercial structures, etc. There is likely to be significant dislocation of people and land acquisition. Whereas, the construction of a new Bypass will have significant land acquisition but there are environmental and resettlement advantages to a bypass route. Some of the general environmental and social issues those will need to be considered during improvement of the project road Table V-1.

**Table V-1: Characteristic and Impacts the Proposed Bypass at Jaintapur**

| Alt no.        | Alignment   | Characteristics   | Environmental Issues   | Other issues   |
|----------------|---|---|--|--|
| Existing route | Zigzag and substandard alignment  | The existing zigzag road passes through the important commercial centre as well as residential areas at Jaintapur | Widening of this route will have significant adverse impacts on the human interest, since demolition of huge physical structures will occur. Though impact on natural environment will be insignificant but likely to have significant problems during construction phase; pollution of air and noise as well as water and soil contamination etc. | Would have significant adverse impacts on business and livelihood of the affected persons  |
| New Bypass     | Thick line alternative mostly on agriculture lands as shown on the Google Map | All new sections would pass through predominantly flat and slightly elevated agricultural land.                   | Significant impact of loss of agricultural land forever. Problems of developing undulating land, if any, and ensuring new road does not create flooding or water logging and block outfalls. Likely to have significant problems during construction phase; pollution of water and soil contamination etc.   | Would provide better communication with shorter and more direct route through bypassing the commercial and residential built up areas in Jaintapur |

#### **d. Minor Route Alternative**

245. The present alignment between Sylhet-Tamabil will require numerous short distance straightening realignments to ensure the designed alignment is in accordance with the RHD standards. The selection of these minor realignments will need to ensure the minimum disturbance to the local environment (and to ensure minimum disturbance to the built environment, land acquisition and resettlement). This is particularly critical where the road passes through undulating hilly areas and minimal tree cutting, and disturbance to the local environment should occur.

#### **e. Major Intersections**

246. The road has several major junctions with National and Regional Highways. Most of these junctions were improved with channelized roundabouts and T-junctions under Rehabilitation of Sylhet-Tamabil Road during May 15, 2020-2025. There are also a number of road intersections. At this stage no firm decision has been made as to whether a bypass is required, its location, or whether the route will use the existing alignment with significant land acquisition and clearance or an elevated (overpass) option will be considered. They need redesign to meet with dual carriageway requirements. Besides these major junctions, there are several junctions with LGED roads. Latitudes and longitude of intersections and key location points are given in Table V-2.

**Table V-2: Latitude and Longitude of Intersections and Key Location Points**

| <b>Chainage</b> | <b>Location</b>        | <b>Northing</b> | <b>Easting</b> | <b>Remarks</b>         |
|-----------------|------------------------|-----------------|----------------|------------------------|
| 226.3           | Humayun Rashid Chattar | 24 52 39        | 91 52 32       | Intersection with N208 |
| 226.5           | Kadamtali              | 24 52 43        | 91 52 38       | Intersection with R250 |
| 241.1           | Jaintapur              | 24 53 42        | 91 52 43       | End of city bypass     |
| 286.0           | Check post, Tamabil    | 25 10 21        | 90 05 22       | End of Project         |

## VI. INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

### A. Purpose of Public Participation

247. Public participation and community consultation have been taken up as an integral part of social and environmental assessment process of the project. Public participation has been viewed as a continuous two-way process, involving promotion of public understanding of the processes and mechanisms through which developmental problems and needs are investigated and solved. Consultation was used as a tool to inform and educate stakeholders about the proposed action both before and after the development decisions were made. It assisted in identification of the problems associated with the project as well as the needs of the population likely to be impacted. This participatory process enabled the participation of the local people in the decision-making process. The involvement of the various stakeholders ensured that the affected population and other stakeholders are informed, consulted and allowed to participate at various stages of project preparation.

### B. Reconnaissance field visit

248. As a start-up activity for accomplishing the tasks assigned, JV field team made a reconnaissance visit over the entire length of the road to the project site particularly starting point from Sylhet to ending point of Tamabil on July 30-31, 2019. The team visited each and every potentially affected location, prepared a preliminary list of potentially displaced properties indicating their nature and types such as house, shop, market, social institutions, cantonment area etc. They also identified the bottlenecks to be faced during project resettlement plan implementation of the existing right of way. The team also talked to the potential affected people about probable project impacts and upcoming activities.



**Figure VI-1: Consultation with local people during reconnaissance visit on July 30-31, 2019**

### C. Questionnaire Development

249. Consultant has prepared different tools and techniques for updating the Resettlement Action Plan (RAP) for this project. JV has already developed the following questionnaires;

- ✓ Developed questionnaire for Socio-economic Census and IOL Survey,
- ✓ Developed questionnaire for Tenant Survey
- ✓ Developed questionnaire for Wage Labor Survey
- ✓ Developed questionnaire for Vendor Survey
- ✓ Developed questionnaire for Poverty Valuation Survey

250. Detailed questionnaires have been shared with the RHD for approval. The RHD has approved the questionnaires, now those questionnaires have been uploaded in electronic

device /TAB. Below shows the sample of the feature of the questionnaire in TAB. The Census and IOL survey to be carried out through Mobile Device. JV has its own local deployment to use the system directly from the cloud. Mobile apps will be able to communicate with the cloud based on the configuration. If any field office needs to have its own deployment, provision for that will also be open. In that case, field or central office of JV will synchronize their data. We are proposing to use open source My SQL so that this licensing cost can be reduced.

#### D. Stakeholders

251. The stakeholders of the Sylhet-Tamabil highway improvement project include the (i) financing agencies e.g. AIB, GoB (ii) government organizations involved in planning, design and implementation e.g. RHD, DoE, Forest Department, Department of Agriculture Extension (DAE), Bangladesh Water Development Board (BWDB), Civil Administration (DCs), Public Representatives, NGOs, etc., (iii) Consultants and Contractor involved with feasibility study, detailed design and bidding document preparation and implementation phases and (iv) PAPs affected positively and/or negatively directly and/or indirectly

#### E. Public Consultation at Sylhet – Tamabil Project Sites

252. Six (6) Public Consultation Meeting were conducted at Sylhet-Tamabil Project sites from August 04 to 06, 2019. Officials from the local administration and local government institutions including Upazila Chairman, Union Parishad Chairman, and Ward Members, and local influential people etc were present in the consultation meetings. The potential affected people including land owners, business men, tenant, community leaders, CPR management committee and different stakeholders took active part in the discussion. Detailed date, venue and time of public consultation are given in the Table Vi-1. (Attendance sheet Appendix-7)

**Table VI-1: Dates and venue and time of public consultation**

| Date     | Public Consultation Venue     | Time              |
|----------|-------------------------------|-------------------|
| 04-08-19 | Btashawr Bazar, Sylhet sadar- | 9.30 to 11.30 AM  |
| 04-08-19 | Pirar Bazar, Sylhet sadar-    | 03.00 to 5.00 PM  |
| 05-08-19 | Daspara Bazar, Sylhet sadar   | 10.00 to 12.00 AM |
| 05-08-19 | Darboost Union Parashad       | 30.30 to 05.30 PM |
| 06-08-19 | Haripur Bazar, Jaintapur      | 09.30 to 11.30AM  |
| 06-08-19 | 4 No. Banglabazar, Jaintapur  | 03.00 to 05.00 PM |

#### F. Key findings of the consultation meeting;

- Local people are aware of the progress of activities including land acquisition and resettlement activities.
- Participants want to know about the appropriate Right of Way (how much land will be required in both sides)
- They understand that the project will have a visible impact on the improvement of transport system.
- Local people want adequate compensation for the affected properties.
- Community structures like religious institutions and school should be avoided.
- Compensation cheque would be handed over at their door step without hassle
- Participants of Btashawr Bazar expected to change the alignment. They want bypass and save the bazer
- Participants of Banglabazar, Jaintapur expected to change the lignment. They want bypass and save the bazer
- People wanted to save trees as much as possible and need more plantation along the road



Btashawr Bazar , Sylhet Sadar, August 04, 2019

Haripur Bazar, Jaintapur, August 06, 2019



Darbost Union Parashad, August 05, 2019

4No. Banglabazar, Jaintapur, August 06, 2019



Pirar Bazar, Sylhet sadar, August 04, 2019

**Figure VI-2: Picture of the public consultation meetings on August 04 to 06, 2019**



**Figure VI-3: Meeting with PD, AIIB and Design Team at Sylhet, August 17, 2019**

253. A Progress Review Meeting was held with PD, AIIB Team, Design Review Team and other Stakeholders on August 17, 2019 at Nazimgarh Resorts, Sylhet. JV has appraised the project activities and also discussed about the progress of updating ESIA, RAP and IT system development activities.

#### G. Consultation Meetings after IEE submission

254. As explained above there has been limited community consultation at this stage. The Consultants however do intend to undertake consultation at the end of the FS stage prior to the required AIIB consultation at Draft ESIA stage. This will take the form of preparing a summary statement of potential issues and mitigation and management techniques at some of the more critical parts of the alignment in the urban areas.

255. One-page document will be distributed to community members, local government, and other key stakeholders and directly to communities involved. Some selected focus group discussions will be held to determine some of the key issues and response to the alignment and to alternatives where relevant. All verbal and written comments will be responded where appropriate and incorporated into the DED where necessary and reported upon in the ESIA

#### H. Consultation Meetings at Detailed Design Stage

256. In accordance with the AIIB requirements two consultation meetings will be held prior to the commencement of the ESIA and again on the completion of the Draft ESIA. The preparation and completion of the ESIA will take place in end of 2019 during the DED process. The location and number of meetings are still to be determined. The meetings will be attended by RHD, Consultant, and the Consultant Environmental team. Local government will also be invited and to participate in the meetings and consultation and should play an important role in ensuring that the community is fully aware of the project and is consulted prior to and during the construction phase

Information Disclosure: This will be carried out in accordance with AIIB requirements.

Reporting: All consultation activities will be incorporated into the ESIA report as necessary

#### I. Summary of Consultations Outcome

257. It will be essential to continue this consultation process to ensure that the community remains supportive and that they are fully informed of progress particularly before and during

the construction period. It will be essential that the community is given information on the grievance redress mechanism and that regular meetings with the community are held in the future. Once the project has been approved and a construction program has been defined, the first of a number of community meetings must be held to provide details of the construction program and to give information on the grievance redress mechanism. A website should be set up including all this information, however, many of the community may not have access to the internet, therefore face to face meetings and hard copy handouts must be provided to the whole community.

258. A project-specific grievance redress mechanism (GRM) will be established to receive, evaluate, and facilitate the resolution of PAP's concerns, complaints, and grievances about the social and environmental performance at the level of the project. The GRM will aim to provide a time-bound and transparent mechanism to voice and resolve social and environmental concerns linked to the project.

## VII. GRIEVANCE REDRESS MECHANISM

### A. General

259. Land acquisition in Bangladesh allows landowners object in the beginning of the legal process. Once the objections are heard and disposed of, there is virtually no provision to attend complaints and grievances that individual landowners may bring in the later stages of the acquisition process. As the law does not recognize the non-titled users of land, there is no mechanism to hear and redress their grievance in the legal process. Again, project interventions and construction activities on site may raise environmental, social and public health concerns among the displaced persons and their communities. The communities may also be interested in transparency in procurement and quality of construction. Complaints and grievances may, therefore, range from land acquisition, resettlement, procurement and quality of works on site. Disputes over ownership and inheritance of the acquired lands of affected persons and assets missed by the census, joint verification; valuation of affected assets; compensation payment; and the like may arise in the process of resettlement.

### B. Common GRM

260. A common GRM will be in place for social, environmental, or any other grievances related to the project; the Resettlement Action Plans (RAPs) and IEEs/ESIA will follow the GRM described below, which is developed in consultation with key stakeholders. The GRM will provide an accessible and trusted platform for receiving and facilitating resolution of affected persons' grievances related to the project. The multi-tier GRM for the project is outlined below, each tier having time-bound schedules and with responsible persons identified to address grievances and seek appropriate persons' advice at each stage, as required.

261. A Grievance Redress Committee (GRC) will be established at the community level in each Upazila/Union to resolve complaints and grievances informally through community participation. The GRCs will be formed with representatives from RHD, local elected representatives from the Local Government Institutions (LGI), DPs, women DPs (if any), and appropriate local NGOs to allow voices of the affected communities to be heard and ensure a participatory decision-making process. GRC decisions will be on a majority basis and will be publicized among the local communities. Complainants are encouraged to use the GRC; however, they may access the judicial system at any time.

262. Project Affected Persons (PAPs) will have the flexibility of conveying grievances/suggestions by dropping grievance redress/suggestion forms in complaints/suggestion boxes that have already been installed by project area or through telephone hotlines at accessible locations, by e-mail, by post, or by writing in a complaint register in RHD offices. Careful documentation of the name of the complainant, date of receipt of the complaint, address/contact details of the person, location of the problem area, and how the problem was resolved will be undertaken. The PMU safeguard officer will have the overall responsibility for timely grievance redress on environmental and social safeguards issues and for registration of grievances, related disclosure, and communication with the aggrieved party through the PIU designated safeguard focal person.

### C. Grievance Redress Process

263. GRC meetings will be held in the respective Field Office of RHD or other location(s) as agreed by the Committee. If needed, GRC members may undertake field visits to verify and review the issues at dispute, including titles/shares, reason for any delay in payments or other relevant matters. In case of grievances that are immediate and urgent in the perception of the complainant, the contractor and CSC on-site personnel will provide the most easily accessible or first level of contact for quick resolution of grievances. Contact phone numbers and names of the concerned PMU of the RHD safeguard focal person and contractors; will be posted at all construction sites at visible locations.

**a. 1<sup>st</sup> Level Grievance:**

264. The phone number of the PIU office should be made available at the construction site signboards. The contractors and PIU, PMU safeguard focal person can immediately resolve on-site in consultation with each other, and will be required to do so within 7 days of receipt of a complaint/grievance.

**b. 2<sup>nd</sup> Level Grievance**

265. All grievances that cannot be redressed within 7 days at field/ward level will be reviewed by the grievance redress cell (GRC) headed by Project Director (PD) of the RHD with support from PMU designated safeguard focal person and CSC environment and resettlement specialists. GRC will attempt to resolve them within 15 days. The PIU designated safeguard focal person will be responsible to see through the process of redress of each grievance.

**c. 3<sup>rd</sup> Level Grievance**

266. The PMU designated safeguard focal person will refer any unresolved or major issues to the PMU safeguard officer and CSC environmental and resettlement specialists. The PMU in consultation with these officers/specialists will resolve them within 30 days.

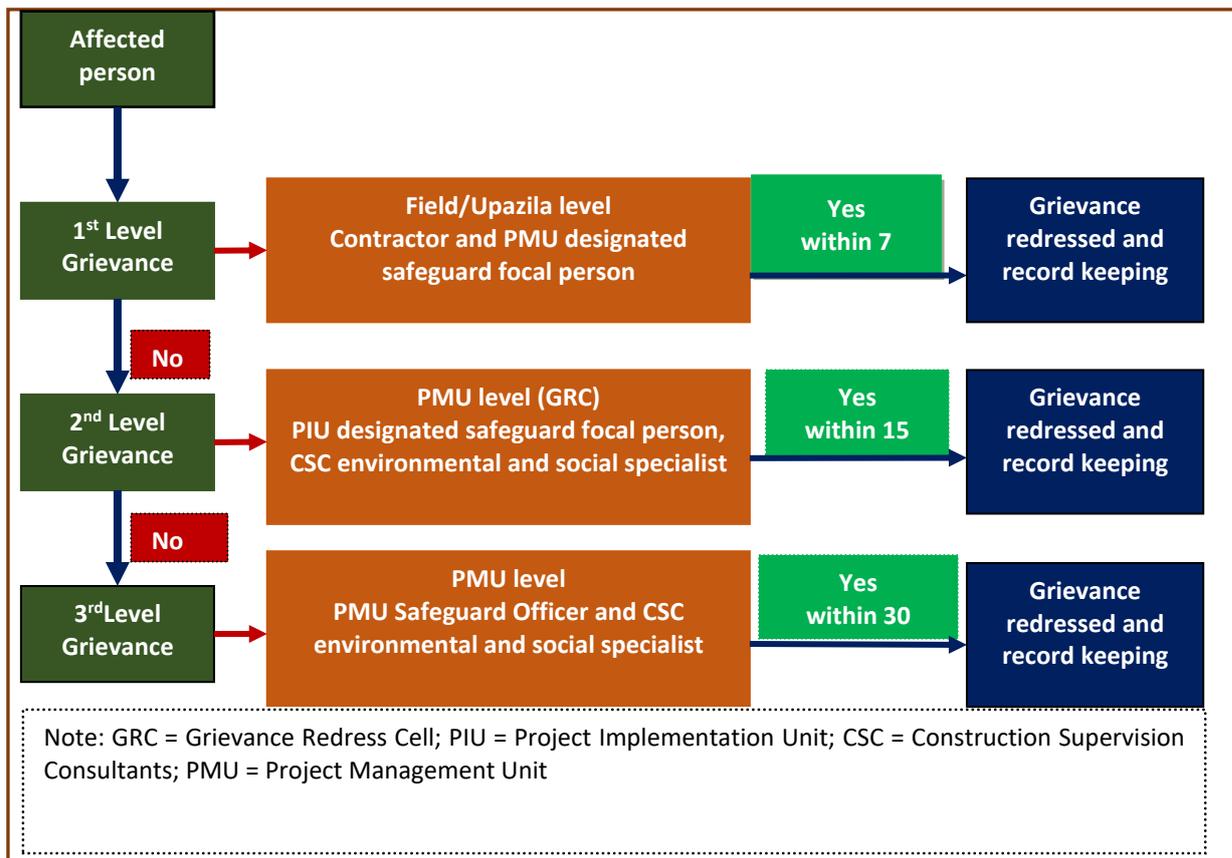
**d. 4<sup>th</sup> Level Grievance**

267. The Chief Engineer, RHD. Should the resolution from the PMU fail to satisfy the aggrieved DPs, they will be facilitated to forward their case records for further review and settlement with the office of the Chief Engineer, RHD at Dhaka. The aggrieved DP will submit the petition with all documentary evidences of complaints and the resolution proceedings at Step 2 and 3 within 2 weeks after the decision from the PMU is received.

268. Any decisions and proceedings of GRC meetings will be finally approved by the Project Director, PMU, RHD. The approved GRC decisions will be implemented on site within the framework of the resettlement plan.

269. Despite the project GRM, an aggrieved person shall have access to the country's legal system at any stage and accessing the country's legal system can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM.

270. In the event that the established GRM is not in a position to resolve the issue, the affected person also can use the AIIB and ADB Accountability Mechanism (AM) through directly contacting (in writing) the Complaint Receiving Officer (CRO) at AIIB headquarters. The complaint can be submitted in any of the official languages of AIIB's DMCs. The AIIB and ADB Accountability Mechanism information will be included in the DPs to be distributed to the affected communities, as part of the project GRM.



**Figure VII-1: Project Grievance Redress Mechanism**

#### D. Record keeping

271. Records of all grievances received, including contact details of complainant, date the complaint was received, nature of grievance, agreed corrective actions, and the date these were affected and outcome will be kept by PMU of the RHD. The number of grievances recorded and resolved and the outcomes will be displayed/disclosed in the PMU office and on the web, as well as reported in monitoring reports submitted to AIIB on a semi-annual basis.

#### E. Periodic Review

272. The PMU safeguard officer will periodically review the functioning of the GRM in each PMU and record information on the effectiveness of the mechanism, especially on the project's ability to prevent and address grievances.

#### F. Costs

273. All costs involved in resolving the complaints (meetings, consultations, communication, and reporting/information dissemination) will be borne by the concerned PIU at PMU-level; while costs related to escalated grievances will be met by the PMU. Cost estimates for grievance redress are included in resettlement cost estimates.

274. The GRC will also use the punitive clauses of the 1996 Law on Environmental Protection and Natural Resources Management in conjunction with MOE to prosecute offending parties.

## VIII. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

### A. Objectives of the ESMP

275. The purpose of the environmental and Social management plan (ESMP) is to ensure that the activities are undertaken in a responsible, non-detrimental manner with the objectives of: (i) providing a proactive, feasible, and practical working tool to enable the measurement and monitoring of Safeguard performance on-site; (ii) guiding and controlling the implementation of findings and recommendations of the Safeguard assessment conducted for the project; (iii) detailing specific actions deemed necessary to assist in mitigating the environmental and social impact of the project; and (iv) ensuring that safety recommendations are complied with.

276. The PMU will ensure that the ESMP is made part of the contract documents. The Contractor will be responsible for preparing a specific Environmental and Social Management Plan (Contractor's Environmental and Social Management Plan) based on this ESMP, prior to the commencement of construction activities. The Supervising Engineer (SE) will be responsible for reviewing and approving the Contractor's ESMP as well as ensuring that contractors comply with its mandates. Public complaints regarding adverse environmental impacts arising from inadequate implementation of the ESMP will be captured through the proposed Grievance Redress Mechanism.

277. A copy of the ESMP must be kept on work sites at all times. This ESMP is included in the bid documents and will be further reviewed and updated during implementation. The ESMP will be made binding on all contractors operating on the site and will be included in the contractual clauses. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

278. They can only do this if the conditions listed in the ESMPs are transferred into the Contract Terms and Conditions and Contract Specification(s). Often generic Contract Specification(s), such as those prepared the Federation International des Ingenious Counsels (FIDIC), adopted by the GOB, have environmental clauses that should be used as the basic framework for environmental clause insertion. Under this Sylhet-Tamabil Road Up gradation Project, the FIDIC Contract Specification or other relevant Contract Specification may be adopted in Contract documents, which may need to be modified to better incorporate the environmental measures listed in the ESMP.

279. For civil works, the contractor will be required to (i) establish an operational system for managing environmental and social impacts (ii) carry out all of the monitoring and mitigation measures set forth in the ESMP; and (iii) implement any corrective or preventative actions set out in safeguards monitoring reports that the employer will prepare from time to time to monitor implementation of this ESIA and ESMP. The contractor shall allocate a budget for compliance with these ESMP measures, requirements and actions.

### B. ESMP – Mitigation Measures

280. Mitigation measures for each of the impacts listed in the Table VIII-1. Responsible institutions/departments for the implementation and supervision of each of the environmental and social issues have also been illustrated. Mitigation measures have been suggested based on the knowledge of the Environmental and Social Specialist, suggestions of the stakeholders collected during public consultation, FGDs and opinions from other relevant specialists.

281. The mitigation measures will be considered successful when comply with the Environmental Quality Standards (EQS), policies, legal requirements set by DoE and other relevant GoB organizations. In absence of DoE's own EQS, other relevant international or other recognized organization's quality standard will have to be followed.

Table VIII-1: Environmental and Social Management Plan – Mitigative Measures

| Ref. No.                          | Issues & Impacts  | Mitigation Measures   | Responsible for       |  | Cost Estimate (TK) |
|-----------------------------------|---|---|-----------------------|--|--------------------|
|                                   |   |   | Implementation        | Supervision  |                    |
| <b>1.0 Pre-construction Phase</b> |   |   |                       |  |                    |
| 1.1                               | <b>Obtaining of SCC/NOCs</b><br>Impact of trees and vegetation  | <ul style="list-style-type: none"> <li>▪ The proposed road will be constructed in RHD own land and private land new road networks, that's why all necessary consents, permits, clearance, etc. Will be required to be obtaining before start of civil works (ensured from RAP report).</li> <li>▪ Obtain permission from concerned authority before commence of tree cutting</li> <li>▪ It will offer a significant opportunity to bring benefits to the local community and to Project Affected Persons (PAP's), vulnerable groups, particularly women by direct involvement in the program.</li> <li>▪ Forestation programmes should be initiated, covering the road ROW, any embankments, and land near bridges and culverts to compensate for the loss of vegetation, to reduce the risk of erosion of the banks, and finally as a noise reducing wall.</li> <li>▪ Some long-term disturbance to roadside trees but these will all be replaced by 5 for each tree felled (Source; DOE)</li> </ul> | RHD/DOE/<br>Contactor | CSC  | Engineering cost   |
| 1.2                               | <b>Climate (Impact of Climate change on Road)</b><br>Increased and unusual rainfall patterns will increase potential for flooding Increased sea level rise; unlikely to be an issue in Sylhet-Tamabil Road. | <ul style="list-style-type: none"> <li>• FS and design to ensure increased road height</li> <li>▪ Design to ensure that channels and culverts can accommodate increases in rainfall.</li> </ul>   | Design consultant     | RHD  | N/A                |
| 1.2                               | <b>Seismic Hazards</b><br>Impact of structures temporary and permanent  | <ul style="list-style-type: none"> <li>▪ Considered in deigning of all major structures like bridges, culverts and pavements</li> <li>▪ All outstanding acquisition to be carried out in accordance with government regulations (Amendment, Acquisition and Requisition of Immovable Property Ordinance 2017).</li> <li>▪ Ensure contractors act responsible and inform farmers in advance of loss of land and potential disruption.</li> </ul>   | RHD/Contactor         | CSC  | Engineering cost   |
| 1.3                               | <b>Social/Economic</b><br><ul style="list-style-type: none"> <li>• Increase in economic activity caused by better road communication</li> <li>• Loss of business to commercial</li> </ul>                   | <ul style="list-style-type: none"> <li>▪ Local communities need to be advised on how to best benefit from road improvement</li> <li>▪ Additional crossing points added during construction if considered necessary</li> </ul>   | RHD                   | Monitoring of any adverse impacts on local community and farmers | Engineering cost   |

| Ref. No. | Issues & Impacts   | Mitigation Measures  | Responsible for |             | Cost Estimate (TK) |
|----------|--|--|-----------------|-------------|--------------------|
|          |  |  | Implementation  | Supervision |                    |
|          | <p>areas where central barrier stops traffic crossing road; business comes from two way only, not four way</p> <ul style="list-style-type: none"> <li>Some adverse impacts if some businesses lose some of trade</li> </ul>                    |  |                 |             |                    |
| 1.4      | <p><b>Updating of ESMP based on necessary</b><br/>-Specific impacts will be identified as per design updating and construction works</p>   | <ul style="list-style-type: none"> <li>Update IEE and ESMP as per necessary of detail design and construction works</li> <li>Ensure updated ESMP is provided to contractors</li> </ul>   | RHD/ Consultant | CSC         | Engineering cost   |
| 1.5      | <p><b>Existing Utilities</b><br/>Disruption of services (short term).</p>  | <ul style="list-style-type: none"> <li>Drawing from the consultant's visit, there was no utility or services found. Therefore, disruption in services is not expected.</li> <li>There is trees and vegetation alongside the existing ROWs and proposed alignment. In addition, there is water body nearby.</li> <li>Short-term impact is expected on flora and fauna.</li> <li>Require construction contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services.</li> <li>Existing infrastructure (such as T &amp; T Line, dweller, electric pole, and shop/boundary wall etc.) shall be relocated before construction starts at the project sites.</li> <li>Prior permission shall be obtained from respective local authority for use of water for construction. Use of water for construction works shall not disturb local water users.</li> </ul> | RHD             | RHD/CSC     | Engineering cost   |
| 1.6      | <p><b>Construction Camps, &amp; Stock Yards</b></p> <ul style="list-style-type: none"> <li>Disruption to traffic flow and sensitive receptors</li> <li>Water body and agricultural land may be disturbed</li> </ul>                            | <ul style="list-style-type: none"> <li>Determine locations prior to award of construction contracts.</li> <li>Avoid nearby water body, educational institutes and agricultural land</li> </ul>   | Contactora      | RHD/CSC     | contractor         |
| 1.7      | <p><b>Sources of Materials</b><br/>Extraction of materials can disrupt natural land contours Air pollution and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water</p> | <ul style="list-style-type: none"> <li>Prepare list of approved quarry sites and sources of materials</li> <li>Select authorized supplier</li> </ul>   | Contactora      | RHD/CSC     | contractor         |

| Ref. No.                       | Issues & Impacts  | Mitigation Measures  | Responsible for |             | Cost Estimate (TK) |
|--------------------------------|---|--|-----------------|-------------|--------------------|
|                                |   |  | Implementation  | Supervision |                    |
|                                | pollution.  |  |                 |             |                    |
| 1.6                            | <b>ESMP Implementation Training and awareness</b><br>Irreversible impact to the environment and social, contractor representative/ workers, RHD officials   | <ul style="list-style-type: none"> <li>▪ Training will be required to undergo ESMP implementation including waste management, Standard operating procedures (SOP) for construction works; health and safety (H&amp;S), core labor laws, applicable environmental laws, etc</li> </ul>  | Contractor      | RHD/CSC     | Engineering cost   |
| <b>2.0 Construction Phase</b>  |   |  |                 |             |                    |
| <b>A. Physical Environment</b> |   |  |                 |             |                    |
| 2.1                            | <b>Topography, Landforms, Geology</b><br>Significant amount of gravel, sand, bitumen and cement will be required for this project. Extraction of construction materials may cause localized changes in topography and landforms. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures. | <ul style="list-style-type: none"> <li>▪ Utilize readily available sources of materials. If contractor procures materials from existing borrow pits and quarries, ensure these conform to all relevant regulatory requirements.</li> <li>▪ All land should be restored to original state and contours after construction, tree planting to support this</li> <li>▪ Construction methods to reduce or eliminate pollution of soil and subsoil.</li> <li>▪ Soil plan to be submitted to RHD</li> <li>▪ All oil and liquid waste to be disposed of in approved sites to ensure no soil contamination.</li> <li>▪ All land used temporarily to be reclaimed and returned to agricultural use in accordance with government regulations.</li> </ul> | Contractor      | RHD/CSC     | Engineering cost   |
|                                | <b>Flooding and Drainage</b> <ul style="list-style-type: none"> <li>• Potential for some temporary flooding of site and adjacent areas during rainy season</li> <li>• Flooding will only be short term and localized</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Good management of site to ensure no short-term flooding.</li> <li>▪ All surface water courses will be protected by settling ponds and filters.</li> <li>▪ Regular cleaning of channels to avoid choking.</li> <li>▪ Provision of adequate cross drainage structures to easily drain off water to canals and other lowland areas;</li> <li>▪ Ensure that storm water drains and highway drainage systems are periodically cleared to maintain storm water flows during construction.</li> </ul>   | RHD/Contractor  | RHD/CSC     | contractor         |
| 2.2                            | <b>Soil Quality</b> <ul style="list-style-type: none"> <li>• Leakages of oil and chemical materials from construction activity</li> <li>• Inappropriate disposal of waste</li> <li>• Exhaust gas and dust from vehicles</li> </ul>  | <ul style="list-style-type: none"> <li>▪ Storage of oil and chemical materials in an appropriate storage site and method to prevent permeation into the ground.</li> <li>▪ Prohibit illegal dumping</li> <li>▪ Soil quality monitoring</li> </ul>  | Contractor      | RHD/DOE/CSC | Engineering cost   |
| 2.3                            | <b>Agricultural Activities</b>  | <ul style="list-style-type: none"> <li>▪ All outstanding acquisition to be carried out in accordance with</li> </ul>   | Contractor      | RHD/CSC     | Engineering        |

| Ref. No. | Issues & Impacts   | Mitigation Measures   | Responsible for |             | Cost Estimate (TK) |
|----------|--|---|-----------------|-------------|--------------------|
|          |  |   | Implementation  | Supervision |                    |
|          | <ul style="list-style-type: none"> <li>Loss of land/acquisition of land.</li> <li>Disturbance to farmers access and activities</li> <li>Loss of land for borrows pits or stockpiling.</li> <li>Dust will affect crop production</li> </ul>   | <p>government regulations.</p> <ul style="list-style-type: none"> <li>Ensure contractors act responsible and inform farmers in advance of loss of land and potential disruption.</li> </ul>   |                 |             | cost               |
| 2.4      | <p><b>Surface/Waste Water Quality</b></p> <ul style="list-style-type: none"> <li>Improper discharge of effluents and liquid waste from construction and project/ labour camps will pollute surface water</li> <li>Dredging for fill material may pollute surface water.</li> </ul> <p>Water body nearby the project area. However, only along the proposed road there is Rivers, Haors, Khals and ponds which might be impacted during the road improvement. However, the expected impacts are moderate negative but short term, site-specific within a relatively small area and reversible by mitigation measures.</p> | <p><b>General:</b></p> <ul style="list-style-type: none"> <li>No disposal of liquid and solid wastes into surface water areas without appropriate treatment;</li> <li>Dredged material only to be disposed at the base of river/stream</li> <li>Disposal of effluents to be strictly controlled</li> <li>Bentonite waste only to be disposed of in controlled settling ponds..</li> <li>Water quality will be tested pre-during-post construction by contractor.</li> <li>Location for stockyards for construction materials shall be identified far away from watercourses.</li> <li>Place storage areas for fuels and lubricants away from any drainage leading to water bodies.</li> <li>Take precautions to minimize the wastage of water in the construction activities.</li> <li>Take all precautions to prevent entering of wastewater into nearby watercourses.</li> <li>Ensure diverting storm water flow during construction shall not lead to inundation and other nuisances in low lying areas.</li> <li>Ensure no construction materials like earth, stone, or appendage are disposed of in a manner that may block the flow of water</li> </ul> | Contractor      | RHD/DOE/CSC | Engineering cost   |
| 2.5      | <p><b>Ground water Quality</b></p> <ul style="list-style-type: none"> <li>Pollution of groundwater from labour camps latrines</li> <li>Pollution of groundwater by spillage of chemicals, fuel, lubricants etc</li> <li>Pollution of groundwater by unregulated disposal of solid waste.</li> </ul>  | <ul style="list-style-type: none"> <li>Workforce camps will be located away from water resources. All practical measures such as provision of septic tanks, garbage bags, and other sanitation facilities will be implemented at the construction camps to prevent the wastewater and solid wastes from entering well and groundwater recharge areas.</li> <li>Wells used for drinking will be tested quarterly to ensure portability.</li> </ul>   | Contractor      | RHD/DOE/CSC | Engineering cost   |
|          | <p><b>Fish and Aquatic</b></p> <ul style="list-style-type: none"> <li>Construction work may affect</li> </ul>  | <ul style="list-style-type: none"> <li>Fish migration routes to be considered during construction</li> <li>Manage all liquid waste disposal and ensure no accidental spills of liquid</li> </ul>  | Contractor      | RHD/CSC     |                    |

| Ref. No. | Issues & Impacts  | Mitigation Measures   | Responsible for |             | Cost Estimate (TK) |
|----------|---|---|-----------------|-------------|--------------------|
|          |   |   | Implementation  | Supervision |                    |
|          | <p>migration of fish and health of fish</p> <ul style="list-style-type: none"> <li>Commercial fishing may be impacted</li> <li>Will be significant near Main River at construction site.</li> </ul>   | <p>waste into river</p> <ul style="list-style-type: none"> <li>Disposal of dredged materials only to take place in deepest parts of rivers.</li> </ul>  |                 |             | N/A                |
| 2.6      | <p><b>Borrow pits and haul routes</b></p> <ul style="list-style-type: none"> <li>Increase in open water and potential for breeding ground for mosquitoes</li> <li>Disturbance to local environment and social, in particular dust and noise from equipment and vehicles;</li> <li>Loss of agricultural land;</li> <li>Haul routes of material and equipment</li> <li>Noise and air pollution</li> <li>Danger to other road users, particularly pedestrians and non-motorized and farm vehicles</li> </ul> | <ul style="list-style-type: none"> <li>All borrow pits and haul routes to be agreed with RHD and community before start of work</li> <li>Sites should preferably not be in agricultural use</li> <li>Only approved borrow pits to be used with a plan for closure, remediation and re-cultivation: no use as waste areas</li> </ul>   | Contractor      | RHD/CSC     | N/A                |
| 2.7      | <p><b>Air quality</b></p> <p>Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of vehicle-related pollutants (such as carbon monoxide, sulphur oxides, particulate matter, nitrous oxides, and hydrocarbons) which will affect people who live and work near the sites. The impacts are negative but short-term, site-specific within a relatively small area and reversible</p>   | <ul style="list-style-type: none"> <li>Water spraying to control dust as per necessary;</li> <li>Use tarpaulins to cover soils, sand and other loose material when transported by trucks.</li> <li>Unpaved surfaces used for haulage of materials within settlements shall be maintained dust-free.</li> <li>Arrangements to control dust through provision of windscreens, water sprinklers.</li> <li>Air quality will be tested pre-during-post construction by contractor</li> </ul> | Contractor      | RHD/DOE/CSC | Engineering cost   |

| Ref. No. | Issues & Impacts   | Mitigation Measures  | Responsible for |              | Cost Estimate (TK) |
|----------|--|--|-----------------|--------------|--------------------|
|          |  |  | Implementation  | Supervision  |                    |
|          | by mitigation measures.  |  |                 |              |                    |
| 2.8      | <p><b>Noise &amp; Vibration</b><br/>Temporary increase in noise level and vibrations may be caused by excavation equipment, transportation of equipment, construction materials and construction activity. The impacts are negative but short-Long-term, site-specific within a relatively big area and reversible by mitigation measures.</p> | <ul style="list-style-type: none"> <li>▪ All vehicles and equipment used in construction to be modern and to be regularly maintained.</li> <li>▪ All mixing and other plants to be operated in accordance with manufacturers recommendations and to be located at a distance from all sensitive uses.</li> <li>▪ Restrict all night time activities near to sensitive sites and areas Restrict all construction traffic to 60km per hour</li> <li>▪ Noisy equipment must be screened near sensitive receptors</li> <li>▪ Locate rock crushing, concrete mixing and material shipment yards away from residential areas, schools, colleges and hospitals.</li> <li>▪ Install temporary noise barriers near sensitive locations such as schools, religious places and hospitals</li> <li>▪ Providing the construction workers with suitable hearing protection like ear cap, or earmuffs etc.</li> <li>▪ Monitor noise levels. Maintain maximum sound levels not exceeding 85 decibels (dBA) when measured at a distance of 10 m or more from the vehicle/s.</li> <li>▪ If it is not practicable to reduce noise levels to or below noise exposure limits, the contractor must post warning signs in the noise hazard areas. Workers in a posted noise hazard area must wear hearing protection.</li> <li>▪ Identify any buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity. Complete work in these areas quickly.</li> <li>▪ Noise level will be tested pre-during-post construction by contractor</li> </ul> | Contractor      | RHD/DOE/CSC  | Engineering cost   |
| 2.9      | <p><b>Waste Pollution</b></p> <ul style="list-style-type: none"> <li>▪ Construction waste from construction work</li> <li>▪ Domestic waste from workers</li> <li>▪ Hazardous waste</li> </ul>  | <ul style="list-style-type: none"> <li>▪ Follow the 'Waste Management Plan' in Appendix 4.</li> <li>▪ Conduct separate waste collection and promote recycling and reuse.</li> <li>▪ Appropriate disposal of non-recyclable waste according to rules</li> <li>▪ Hazardous waste should be treated under the related regulation</li> </ul>   | Contractor      | RHD/ CSC     | Contractor         |
| 2.10     | <p><b>Trees and vegetation (Flora)</b></p> <ul style="list-style-type: none"> <li>• Loss of existing flora along roadside; trees and other planting.</li> <li>• Impact on all flora in vicinity of road construction</li> </ul>  | <ul style="list-style-type: none"> <li>▪ It will offer a significant opportunity to bring benefits to the local community and to Project Affected Persons (PAP's), vulnerable groups, particularly women by direct involvement in the program.</li> <li>▪ Forestation programmes should be initiated, covering the road ROW, any embankments, and land near bridges and culverts to compensate for the loss of vegetation, to reduce the risk of erosion of</li> </ul>   | Contractor      | RHD/DFO/ CSC | Engineering cost   |

| Ref. No. | Issues & Impacts  | Mitigation Measures   | Responsible for |             | Cost Estimate (TK) |
|----------|---|---|-----------------|-------------|--------------------|
|          |   |   | Implementation  | Supervision |                    |
|          | <ul style="list-style-type: none"> <li>Dust from construction will impact on growth of trees and vegetation</li> <li>Impact on aquatic vegetation</li> </ul>  | <ul style="list-style-type: none"> <li>the banks, and finally as a noise reducing wall.</li> <li>Protect the vegetation adjacent to the ROW to ensure that no wood is used as fuel wood for heating bitumen.</li> </ul>   |                 |             |                    |
|          | <p><b>Wildlife and Endangered Species</b></p> <ul style="list-style-type: none"> <li>Impact to local ecosystems and species, particularly endangered species and their continued health and sustainability</li> <li>Loss of wildlife due to felling of trees</li> <li>Disturbance to habitat due to construction activities.</li> </ul> | <ul style="list-style-type: none"> <li>Hunting the birds and other animals should be banned at the construction sites</li> <li>Encroachment into forests and wooded areas should be properly regulated and enforced</li> <li>Protection should be given to any special species peculiar to the region and it should be bilateral and multilateral conventions on wildlife.</li> </ul>   | Contractor      | RHD/ CSC    | Contractor         |
| 2.11     | <p><b>Biodiversity</b></p> <p>Activities being located in the Sylhet-Tamabil road built-up area of Sylhet. There are no protected areas in or around proposed site, and no known areas of ecological interest.</p>  | <ul style="list-style-type: none"> <li>If during construction period cutting of trees will be required, compensatory plantation for trees lost at a rate of 1:5 sapling ratio trees for every tree cut, in addition to tree plantation as specified in ESMP cost, will be implemented by the contractor, who will also maintain the saplings for the duration of his contract.</li> <li>All efforts shall be made to preserve trees by evaluation of minor design adjustments/ alternatives (as applicable) to save trees.</li> <li>Special attention shall be given for protecting giant trees and locally-important trees (with religious importance) during implementation.</li> <li>Prevent workers or any other person from removing and damaging any flora (plant/vegetation) and fauna (animal) including fishing in any water body in the subproject vicinity.</li> <li>Prohibit employees from poaching wildlife and cutting of trees for firewood.</li> </ul> | Contractor      | RHD/ CSC    | Contractor         |
| 2.12     | <p><b>Traffic Congestion</b></p> <p>Hauling of construction materials and operation of equipment on-site can cause traffic problems. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.</p>   | <ul style="list-style-type: none"> <li>Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites.</li> <li>Maintain safe passage for vehicles and pedestrians throughout the construction period.</li> <li>Schedule truck deliveries of construction materials during periods of low traffic volume.</li> <li>Erect and maintain barricades, including signs, markings, flags and flagmen informing diversions and alternative routes when required.</li> <li>Notify affected sensitive receptors by providing sign boards informing</li> </ul>   | Contractor      | RHD/ CSC    | Contractor         |

| Ref. No. | Issues & Impacts   | Mitigation Measures  | Responsible for |             | Cost Estimate (TK) |
|----------|--|--|-----------------|-------------|--------------------|
|          |  |  | Implementation  | Supervision |                    |
|          |  | <p>nature and duration of construction activities and contact numbers for concerns/complaints.</p> <ul style="list-style-type: none"> <li>▪ Provide walkways and metal sheets where required to maintain access across for people and vehicles.</li> <li>▪ Increase workforce in front of critical areas such as institutions, place of worship, business establishment, hospitals, and schools.</li> <li>▪ Consult businesses and institutions regarding operating hours and factoring this in work schedules. Ensure there is provision of alternate access to businesses and institutions during construction activities,</li> <li>▪ Ensure any damage to properties and utilities will be restored or compensated to pre-work conditions.</li> </ul> |                 |             |                    |
|          | <p><b>Physical Cultural Resources</b><br/>No record of any cultural resources in area.</p>   | <ul style="list-style-type: none"> <li>▪ In accordance with government regulations, work to be immediately stopped to allow for investigation, recording and recovery. Sites not within alignment but within 500 meters of road must be protected from looting and destruction.</li> <li>▪ Salvage dig to be carried out by approved company before works start on site in area.</li> </ul>  | Contractor      | RHD/ CSC    | Contractor         |
| 2.13     | <p><b>Socio-economic status</b><br/>Project components will be located in RHD and Private land and there is requirement for land acquisition or RAP. Manpower will be required during the construction stage. This can result to generation of contractual employment and increase in local revenue. Thus, potential impact is positive and long-term.</p> | <ul style="list-style-type: none"> <li>▪ Employ at least 50% of labor force from communities in the vicinity of the site. This will have the added benefit of avoiding social problems that sometimes occur when workers are imported into host communities, and avoiding environmental and social problems from workers housed in poorly serviced camp accommodation.</li> <li>▪ Secure construction materials from local/foreign market</li> <li>▪ To ensure engage women employee as per gender action plan</li> </ul>  | Contractor      | RHD/ CSC    | Contractor         |
| 2.14     | <p><b>Community Health and Safety</b><br/>Construction works will impede the access of residents and businesses in limited cases. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures. Poor safety signage and lack of</p>   | <ul style="list-style-type: none"> <li>▪ Provide safety signage at construction sites visible to public</li> <li>▪ Provide safety barriers near any trenches, and cover trenches with planks during non-work hours.</li> <li>▪ Contractor's activities and movement of staff will be restricted to designated construction areas.</li> <li>▪ Consult with Sylhet local authority on the designated areas for stockpiling of, soils, gravel, and other construction materials.</li> <li>▪ If the contractor chooses to locate the work camp/storage area on</li> </ul>  | Contractor      | RHD/ CSC    | Engineering Cost   |

| Ref. No. | Issues & Impacts  | Mitigation Measures  | Responsible for |             | Cost Estimate (TK) |
|----------|---|--|-----------------|-------------|--------------------|
|          |   |  | Implementation  | Supervision |                    |
|          | barriers at work site and trenches will create hazard to pedestrians and children.  | <p>private land, he must get prior permission from the environment specialist and RHD.</p> <ul style="list-style-type: none"> <li>▪ Recycling and the provision of separate waste receptacles for different types of waste shall be encouraged.</li> <li>▪ A general regard for the social and ecological well-being of the site and adjacent areas is expected of the site staff. Workers need to be made aware of the following general rules: (i) no alcohol/drugs on site; (ii) prevent excessive noise; (iii) construction staff are to make use of the facilities provided for them, as opposed to ad hoc alternatives (e.g. fires for cooking, the use of surrounding bushes as a toilet facility); (iv) no fires permitted on site except if needed for the construction works; (v) trespassing on private/commercial properties adjoining the site is forbidden; (vi) other than pre-approved security staff, no workers shall be permitted to live on the construction site; and (vii) no worker may be forced to do work that is potentially dangerous or that he/she is not trained to do.</li> <li>▪ Interested and affected parties need to be made aware of the existence of the complaints book and the methods of communication available to them. The contractor must address queries and complaints by: (i) documenting details of such communications; (ii) submitting these for inclusion in complaints register; (iii) bringing issues to the environmental and social specialist attention immediately; and (iv) taking remedial action as per environmental and social specialist instruction.</li> <li>▪ The contractor shall immediately take the necessary remedial action on any complaint/grievance received by him and forward the details of the grievance along with the action taken to the environmental specialist within 48 hours of receipt of such complaint/grievance.</li> </ul> |                 |             |                    |
| 2.15     | <p><b>Workers Health and Safety</b><br/>There is invariably a safety risk when construction works such as excavation, sand filling, carrying of mixture materials, Shuttering, steel/wood work and earthmoving are conducted in urban areas. Workers need to be mindful of the occupational hazards which can</p> | <ul style="list-style-type: none"> <li>▪ All fossils, coins, articles of value of antiquity, structures and other remains of archaeological interest discovered on the site shall be the property of the government.</li> <li>▪ Prevent workers or any other persons from removing and damaging any fossils, coins, articles of value of antiquity, structures and other remains of archaeological interest.</li> <li>▪ Stop work immediately to allow further investigation if any finds are suspected.</li> </ul>  | Contractor      | RHD/ CSC    | Engineering Cost   |

| Ref. No.                   | Issues & Impacts   | Mitigation Measures  | Responsible for |             | Cost Estimate (TK) |
|----------------------------|--|--|-----------------|-------------|--------------------|
|                            |  |  | Implementation  | Supervision |                    |
|                            | arise from working in height and excavation works. Potential impacts are negative and major but reversible by mitigation measures.   |  |                 |             |                    |
| 2.16                       | <b>Post-construction Clean-up</b><br>Damage due to debris, spoils, excess construction materials   | <ul style="list-style-type: none"> <li>▪ Remove all spoils wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; and.</li> <li>▪ All disrupted utilities restored</li> <li>▪ All affected structures rehabilitated/ compensated</li> <li>▪ The construction camp is to be checked for spills of substances such as used container/water bottles, paint, etc. and these shall be cleaned up.</li> <li>▪ All hardened surfaces within the construction camp area shall be ripped, all imported materials removed, and the area shall be top soiled and regressed using the guidelines set out in the re-vegetation specification that forms part of this document.</li> <li>▪ The contractor must arrange the cancellation of all temporary services.</li> <li>▪ Request RHD to report in writing that worksites and camps have been vacated and restored to pre-project conditions before acceptance of work.</li> </ul> | Contractor      | RHD/CSC     | Contractor         |
| 2.17                       | <b>Submission of ESMP Implementation Report</b><br>Unsatisfactory compliance to ESMP   | <ul style="list-style-type: none"> <li>▪ Appointment of supervisor/Manager to ensure ESMP implementation</li> <li>▪ Timely submission of Progress report/environmental monitoring reports including pictures</li> </ul>  | Contractor      | RHD/CSC     | Engineering Cost   |
| <b>3.0 Operation Phase</b> |  |  |                 |             |                    |
| 3.1                        | <b>Air Quality</b><br><ul style="list-style-type: none"> <li>▪ Exhaust gas from vehicles used for mobilization of equipment and workers</li> <li>▪ Dust from road and drain</li> </ul> | <ul style="list-style-type: none"> <li>▪ Provisions of RHD budget for operation &amp; maintenance;</li> <li>▪ Periodic monitoring;</li> </ul>  | RHD             | RHD and DOE | RHD O & M budget   |
| 3.2                        | <b>Noise Level</b><br><ul style="list-style-type: none"> <li>▪ Noise caused by vehicles moving along the road carrying passengers and goods.</li> </ul>                                | <ul style="list-style-type: none"> <li>▪ Provisions of RHD budget for operation &amp; maintenance;</li> <li>▪ Periodic monitoring;</li> </ul>  | RHD             | RHD and DOE | RHD O & M budget   |
| 3.3                        | <b>Surface/Waste Water Quality</b><br><ul style="list-style-type: none"> <li>▪ Surface water runoff to nearby lands</li> <li>▪ Rivers/Ponds/Haors along the road</li> </ul>            | <ul style="list-style-type: none"> <li>▪ Provisions of RHD budget for operation &amp; maintenance;</li> <li>▪ Periodic monitoring;</li> </ul>  | RHD             | RHD and DOE | RHD O & M budget   |

| Ref. No. | Issues & Impacts  | Mitigation Measures   | Responsible for |             | Cost Estimate (TK) |
|----------|---|---|-----------------|-------------|--------------------|
|          |   |   | Implementation  | Supervision |                    |
|          | <ul style="list-style-type: none"> <li>▪ Waste water to the khal/river /Haor</li> </ul>   |   |                 |             |                    |
| 3.4      | <b>Waste Management</b><br>Clogging of drains.  | <ul style="list-style-type: none"> <li>▪ Provisions of RHD budget for operation &amp; maintenance;</li> <li>▪ Periodic monitoring;</li> </ul>   | RHD             | RHD         | RHD O & M budget   |
| 3.5      | <b>Road Accident</b><br>Increase of road accident due to additional traffics  | <ul style="list-style-type: none"> <li>▪ Provide road safety signs and speed bumps/speed breaker at the densely populated/accident prone area such as school, college, commercial area etc.</li> <li>▪ Provide training to community people to aware about road safety</li> </ul> | RHD             | RHD         | RHD O & M budget   |
| 3.6      | <b>Seismic Hazards/ Flood/Land Slide/ Bridge/Drain/Culvert</b><br>Road Blockage/ Traffic Congestion   | <ul style="list-style-type: none"> <li>▪ Periodic monitoring of PMU/CSC</li> <li>▪ Periodic cleaning of bridge/culverts/ drain/ land slide area (if found during operation)</li> </ul>  | RHD             | RHD         | RHD O & M budget   |
| 3.7      | <b>Increased vehicular volume and speed</b> <ul style="list-style-type: none"> <li>▪ Increased chances of accident</li> <li>▪ Increase noise level</li> </ul> | <ul style="list-style-type: none"> <li>▪ Prepare and implement plan for minimizing vehicular accident i.e. providing necessary traffic signage, pavement marking, speed breaker etc.</li> <li>▪ Prohibiting use of air horn in populated and sensitive areas</li> </ul>           | RHD             | RHD         | RHD O & M budget   |
| 3.8      | <b>Monitoring and Management of Plated Trees</b> <ul style="list-style-type: none"> <li>▪ Survival Rate</li> </ul>  | <ul style="list-style-type: none"> <li>▪ Water/Weeding/Training/Pruning/ Replanting/</li> </ul>   | RHD             | RHD         | RHD O & M budget   |

### C. Environmental and Social Monitoring Plan

282. Environmental and social monitoring is an essential tool for environmental and social management as it provides the basic information for rational management decisions. To ensure the effective implementation of mitigation measures and ESMP plan during construction and operation phase of the project, it is essential that an effective monitoring plan be designed and followed. The effects monitoring will be undertaken to track and report the defined performance indicators and parameters as given in below.

283. The aim of environmental and social monitoring during the pre-construction, construction, completion of works and operation phases of the road is to compare the monitored data against the baseline condition collected during the study period (particularly during the detailed design stage) to assess the effectiveness of the mitigation measures and the protection of environmental components (e.g. air, water, soil, noise etc.) based on the national environmental standards (e.g. ECR 1997). Since the project is likely to have impact on various components of the environment, a comprehensive monitoring plan covering soil erosion, drainage congestion, tree plantation, air quality, water quality, noise, and social-psychological impacts, wildlife movement, workers' and community health and safety and so on need to be developed.

Table VIII-2: Environmental and Social Management Plan – Monitoring Actions

| Ref. No.                          | Environmental Issues                         | Significant Impact   | Purpose of the Monitoring   | Monitoring Method  |  |                                    | Responsibility |                |
|-----------------------------------|--|--|---|--|--|------------------------------------|----------------|----------------|
|                                   |  |  |   | Method of Collecting and Reporting Data  | Location   | Duration and Frequency             | Implementation | Supervision    |
| <b>1.0 Pre-construction Phase</b> |  |  |   |  |  |                                    |                |                |
| 1.1                               | <b>Obtaining of SCC/NOCs</b>                 | Failure to obtain necessary consents, permits, NOC's can result in design revisions and/or stoppage of the Works.  | Compliance to GoB and AIB policies  | Obtaining certificates   | Project site   | Prior to contractor mobilization   | RHD/Contractor | RHD/Consultant |
| 1.2                               | <b>Updating of ESMP</b>                      | Specific impacts will be identified as per design updating and construction works  | Ensuring the compliance with construction schedule  | Preparation of report  | RHD  | During the pre-construction period | Consultant     | RHD            |
| 1.3                               | <b>Existing Utilities</b>                    | Disruption of services (short term).   | Implementation of ESMP  | Obtain record of implantation  | In the work site   | Prior to contractor mobilization   | Contractor     | RHD/Consultant |
| 1.4                               | <b>Construction Camps, &amp; Stock Yards</b> | Disruption to traffic flow and sensitive receptors<br>Water body and agricultural land may be disturbed  | Implementation of ESMP  | Obtaining approval from Consultant/PMU   | In the work site   | Prior to contractor mobilization   | Contractor     | RHD/Consultant |
| 1.5                               | <b>Sources of Materials</b>                  | Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution.   | Compliance with GoB laws and Implementation of ESMP   | Obtaining approval from Consultant/PMU   | RHD  | During the pre-construction period | Contractor     | RHD/Consultant |
| 1.6                               | <b>ESMP Implementation Training</b>          | Irreversible impact to the environment and Social, contactor representative/workers, PMU officials   | Implementation of ESMP  | Obtain record of training  | PMU  | Prior to contractor mobilization   | Consultant     | RHD            |
| <b>2.0 Construction Phase</b>     |  |  |   |  |  |                                    |                |                |
| 2.1                               | <b>Topography, Landforms, Geology</b>        | Significant amount of gravel, Bitumen, sand, rod, and cement will be required for this project. Extraction of construction materials may cause localized changes in topography and landforms. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation | <ul style="list-style-type: none"> <li>▪ Restoration of changes due to construction activities</li> <li>▪ Visual amenity</li> </ul> | <ul style="list-style-type: none"> <li>▪ Visual inspection &amp; consultation with local people</li> </ul> | <ul style="list-style-type: none"> <li>▪ In the work site</li> </ul> | During construction period         | Contractor     | RHD/Consultant |

| Ref. No. | Environmental Issues         | Significant Impact  | Purpose of the Monitoring   | Monitoring Method   |   |  | Responsibility |                |
|----------|------------------------------|---|---|---|---|--|----------------|----------------|
|          |                              |   |   | Method of Collecting and Reporting Data   | Location  | Duration and Frequency   | Implementation | Supervision    |
|          |                              | measures.   |   |   |   |  |                |                |
| 2.2      | <b>Soil Quality</b>          | Significant amount of soil will be required for this project. Extraction of construction materials may cause localized changes in topography and landforms. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.  | <ul style="list-style-type: none"> <li>▪ Restoration of changes due to construction activities</li> <li>▪ Visual amenity</li> </ul> | <ul style="list-style-type: none"> <li>▪ Soil quality test report</li> <li>▪ Parameters for testing are Organic Matter, Zn, Sulphur, Lead and Nitrate</li> </ul>  | Project Site  | <ul style="list-style-type: none"> <li>▪ During construction period</li> <li>▪ <b>Once during construction</b></li> </ul>            | Contractor     | RHD/Consultant |
| 2.3      | <b>Surface Water Quality</b> | <p>Trenching and excavation, run-off from stockpiled materials, and contamination from fuels and lubricants may result to silt-laden runoff during rainfall which may cause reduction in the quality of adjacent bodies of water.</p> <p>Water body nearby the road's alignment. However, only along the Rivers, ponds and Khals which might be impacted during the road improvement. However, the expected impacts are moderate negative but short term,</p> | Evaluation of effect of the mitigation measure towards water pollution  | <ul style="list-style-type: none"> <li>▪ Visual inspection &amp; consultation with local people</li> <li>▪ Water quality test report</li> <li>▪ Surface/Waste water parameters: pH, Temperature, ORP, DO, Phosphate, Alkalinity, Sulphate, Fe, EC, TDS, TSS, Nitrate, COD, and BOD</li> </ul> | <ul style="list-style-type: none"> <li>▪ In the work site</li> <li>▪ Surface Water from nearby Pond of RD-30</li> <li>▪ Waste water from the outfall of drains</li> </ul> | <ul style="list-style-type: none"> <li>▪ <b>Once during construction</b></li> <li>▪ Three during construction period</li> </ul>      | Contractor     | RHD/Consultant |
| 2.4      | <b>Groundwater Quality</b>   | The potential exists for drinking water sources to be contaminated by the seepage of wastes from workers camps through the soil profile into the GW aquifer (particularly if wells access the shallow aquifer).   | Evaluation of effect of the mitigation measure towards water pollution  | <ul style="list-style-type: none"> <li>▪ Record of water borne diseases</li> <li>▪ Water quality test report</li> <li>▪ Groundwater parameters: pH, DO, Lead, Fe,</li> </ul>  | Groundwater from construction camp  | <ul style="list-style-type: none"> <li>▪ <b>Once during construction</b></li> <li>▪ Three time during construction period</li> </ul> | Contractor     | RHD/Consultant |

| Ref. No. | Environmental Issues         | Significant Impact   | Purpose of the Monitoring  | Monitoring Method   |  |   | Responsibility |                |
|----------|------------------------------|--|--|---|--|---|----------------|----------------|
|          |                              |  |  | Method of Collecting and Reporting Data   | Location   | Duration and Frequency  | Implementation | Supervision    |
|          |                              |  |  | EC, TDS, Nitrate, As, TC, FC, Cl, Ca, and Manganese   |  |   |                |                |
| 2.5      | <b>Air quality</b>           | Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of vehicle-related pollutants (such as carbon monoxide, sulphur oxides, particulate matter, nitrous oxides, and hydrocarbons) which will affect people who live and work near the sites. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures. | Evaluation of effect of the mitigation measure towards air pollution   | <ul style="list-style-type: none"> <li>▪ Visual inspection &amp; consultation with local people</li> <li>▪ Air quality test report</li> <li>▪ Parameters are PM<sub>10</sub>, PM<sub>2.5</sub>, Sox, Nox, and CO</li> </ul> | <ul style="list-style-type: none"> <li>▪ In the work site</li> </ul>                                     | <ul style="list-style-type: none"> <li>▪ <b>Once during construction</b></li> <li>▪ Three during construction period</li> </ul> | Contractor     | RHD/Consultant |
| 2.6      | <b>Noise &amp; Vibration</b> | Temporary increase in noise level and vibrations may be caused by excavation equipment, transportation of equipment, construction materials and construction activity. The impacts are negative but short & long term, site-specific within a relatively big area and reversible by mitigation measures.   | Evaluation of effect of the mitigation measure towards noise pollution | <ul style="list-style-type: none"> <li>▪ Visual inspection &amp; consultation with local people</li> <li>▪ Noise level test report</li> <li>▪ Laeq (Day &amp; Night)</li> </ul>   | <ul style="list-style-type: none"> <li>▪ In the work site</li> </ul>                                     | <ul style="list-style-type: none"> <li>▪ <b>Once during construction</b></li> <li>▪ Three during construction period</li> </ul> | Contractor     | RHD/Consultant |
| 2.7      | <b>Waste Pollution</b>       | <ul style="list-style-type: none"> <li>▪ Construction waste from construction work</li> <li>▪ Domestic waste from workers</li> <li>▪ Hazardous waste</li> </ul>  | Evaluation of effect of the mitigation measure for waste               | Record of kinds and quantity of waste, and the disposal method  | <ul style="list-style-type: none"> <li>▪ Along the roads &amp; drains</li> <li>▪ Workers camp</li> </ul> | During construction period  | Contractor     | RHD/Consultant |
| 2.8      | <b>Aesthetics</b>            | The construction activities do not anticipate any cutting of trees but will produce excess excavated earth (spoils), excess construction materials, and solid waste such as  | Evaluation of effect of the mitigation measure                         | Visual inspection & consultation with local people  | In the work site   | During construction period  | Contractor     | RHD/Consultant |

| Ref. No. | Environmental Issues         | Significant Impact   | Purpose of the Monitoring  | Monitoring Method  |  |                            | Responsibility |                |
|----------|------------------------------|--|--|--|--|----------------------------|----------------|----------------|
|          |                              |  |  | Method of Collecting and Reporting Data  | Location   | Duration and Frequency     | Implementation | Supervision    |
|          |                              | removed concrete, wood, packaging materials, empty containers, spoils, oils, lubricants, and other similar items. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures. |  |  |  |                            |                |                |
| 2.9      | <b>Biodiversity</b>          | Activities being located in the built-up area of Project Site. There are no protected areas in or around existing project sites, and no known areas of ecological interest.  | <ul style="list-style-type: none"> <li>▪ Plantation of 10000 trees as per the design as enhancement measures.</li> <li>▪ Confirm that this planting plan is following during the construction period.</li> <li>▪ Also confirm that grass turving and drainage system instalment is preventing surface runoff and erosion.</li> </ul> | <ul style="list-style-type: none"> <li>▪ Visual inspection</li> <li>▪ Record of plant survival percentage</li> </ul>   | In the work site and nearby homestead vegetation | During construction period | Contractor     | RHD/Consultant |
| 2.10     | <b>Traffic Congestion</b>    | Hauling of construction materials and operation of equipment on-site can cause traffic problems. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.                  | Evaluation of effect of construction schedule  | <ul style="list-style-type: none"> <li>▪ Visual inspection &amp; consultation with local people</li> <li>▪ Record of accidents</li> <li>▪ Record of numbers construction vehicles</li> </ul> | In the work site                                 | During construction period | Contractor     | RHD/Consultant |
| 2.11     | <b>Socio-economic status</b> | project components will be located in RHD and Private land there will be requirement for land acquisition or RAP. This can result to generation of contractual employment and increase in local revenue. Thus,                                 | Evaluation of effect of construction schedule  | Consultation with local people   | In the project area                              | During construction period | Contractor     | RHD/Consultant |

| Ref. No.                   | Environmental Issues                            | Significant Impact   | Purpose of the Monitoring                    | Monitoring Method   |                     |   | Responsibility |                |
|----------------------------|---|--|--|---|---------------------|---|----------------|----------------|
|                            |   |  |  | Method of Collecting and Reporting Data   | Location            | Duration and Frequency  | Implementation | Supervision    |
|                            |   | potential impact is positive and long-term.  |  |   |                     |   |                |                |
| 2.12                       | <b>Community health and safety</b>              | Construction works will impede the access of residents and businesses in limited cases. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures. Poor safety signage and lack of barriers at work site and trenches will create hazard to pedestrians and children.  | Evaluation of effect of the work safety plan | <ul style="list-style-type: none"> <li>▪ Visual inspection &amp; consultation with local people</li> <li>▪ Record of accidents</li> </ul> | In the project area | During construction period  | Contractor     | RHD/Consultant |
| 2.13                       | <b>Workers health and safety</b>                | There is invariably a safety risk when construction works such as excavation, sand filling, carrying of mixture materials, Shuttering, steel/wood work and earthmoving are conducted in urban areas. Workers need to be mindful of the occupational hazards which can arise from working in height and excavation works. Potential impacts are negative and major but reversible by mitigation measures. | Evaluation of effect of the work safety plan | <ul style="list-style-type: none"> <li>▪ Visual inspection &amp; consultation with worker</li> <li>▪ Record of accidents</li> </ul>       | In the work site    | During construction period  | Contractor     | RHD/Consultant |
| 2.14                       | <b>Post-construction clean-up</b>               | Damage due to debris, spoils, excess construction materials  | Evaluation the implementation of ESMP        | <ul style="list-style-type: none"> <li>▪ Visual inspection &amp; consultation with local people</li> <li>▪ Reporting</li> </ul>           | In the work site    | At the end of construction period along with the ESMP implementation report | Contractor     | RHD/Consultant |
| 2.15                       | <b>Submission of ESMP implementation report</b> | Unsatisfactory compliance to ESMP  | Evaluation the implementation of ESMP        | Record of report submission   | CSC/PMU             | At the end of construction period   | Contractor     | RHD/Consultant |
| <b>3.0 Operation Phase</b> |   |  |  |   |                     |   |                |                |

| Ref. No. | Environmental Issues               | Significant Impact  | Purpose of the Monitoring  | Monitoring Method  |  |                         | Responsibility          |             |     |
|----------|------------------------------------|---|--|--|--|-------------------------|-------------------------|-------------|-----|
|          |                                    |   |  | Method of Collecting and Reporting Data  | Location   | Duration and Frequency  | Implementation          | Supervision |     |
| 3.1      | <b>Air Quality</b>                 | Movement of vehicle will create air quality   | Visual inspection, and consultation with local people  | <ul style="list-style-type: none"> <li>O&amp;M budget for periodic monitoring</li> </ul> | Project area   | During operation period | RHD                     | RHD and DOE |     |
| 3.2      | <b>Noise Level</b>                 | Movement of vehicle will create noise level   | Visual inspection, and consultation with local people  | <ul style="list-style-type: none"> <li>O&amp;M budget for periodic monitoring</li> </ul> | Project area   | During operation period | RHD                     | RHD and DOE |     |
| 3.3      | <b>Surface/Waste Water Quality</b> | The potential exists for surface water sources to be contaminated by the seepage of wastes from workers camps through the soil profile into the surface water | <ul style="list-style-type: none"> <li>Visual inspection and consultation with worker</li> <li>Waste water quality test</li> </ul> | <ul style="list-style-type: none"> <li>O&amp;M budget for periodic monitoring</li> </ul> | Project area   | During operation period | RHD                     | RHD         |     |
| 3.4      | <b>Health &amp; Safety</b>         | Worker involved in cleaning and maintaining the drains and roads may get sick if not trained and provided the PPE adequately                                  | Visual inspection and consultation with worker   | <ul style="list-style-type: none"> <li>O&amp;M budget for periodic monitoring</li> </ul> | Project area   | During operation period | RHD                     | RHD         |     |
| 3.5      | <b>Waste Management</b>            | Worker involved in waste management and maintaining the project may get sick if not trained/awareness adequately  | Visual inspection and consultation with worker   | <ul style="list-style-type: none"> <li>O&amp;M budget for periodic monitoring</li> </ul> | Project area   | During operation period | RHD                     | RHD         |     |
| 3.6      | <b>Road Accident</b>               | Increase of road accident due to additional traffics  | Accidents due to movement of waste carrying vehicles with the road users.  | Visual inspection, record of accidents and consultation with local people                | <ul style="list-style-type: none"> <li>O&amp;M budget for periodic monitoring</li> </ul> | Project area            | During operation period | RHD         | RHD |

## D. Institutional Capacity Development Program

284. The Project is required to obtain an Environmental Clearance Certificate (ECC) from the Department of Environment (DOE) under the Ministry of Environment and Forest, according to Environmental Conservation Rules 1997 of Bangladesh. Beyond this requirement, Roads and Highways, the proponent of the Project, with the assistance of its Consultant, will also be responsible for ensuring that all environmental and social procedures and proposals are incorporated in the Detailed Engineering Design process and construction process, including the incorporation of appropriate provisions in the Project's Bid Contract Documents. The institutional requirement includes the following;

- **Tender Documents and Contract Preparation:** The environmental and social provisions recommended for inclusion in the tender documents and Contracts for the Sylhet-Tamabil road will be provided in the ESMP. This is essential provisions to be incorporated and enforceable if the goals of the Project are to be fully achieved.
- **Environmental and Social Management as an Integral Part of Construction Supervision:** Once Bids have been accepted and awarded, it will be necessary to monitor compliance with the environmental and social provisions of the Contract as an integral part of overall construction supervision. Supervision by the Construction Supervision Consultants (CSC) will include the following requirements:
  - Ensure that asphalt plants, pilling equipment, construction camps and other facilities are properly sited and installed in accordance with the Contract.
  - Determine the timing and exact locations of both baseline and routine air quality and noise level monitoring and all other monitoring is in accordance with the Contract provisions.
  - Undertake critically important routine visual monitoring of construction, waste disposal and overall environmental and social management practices by the Contractors. Effective environmental and social management during construction will require frequent site visits and observation skills. Adequate staffing of in conjunction with the services provided by its CSC will be required.

### a. Institutional Arrangement

285. The Project is going to be implemented with funding from GoB and AIIB structured local competitive bidding and will provide for the services of a Construction Supervision Consultant (CSC) to assist. In addition, awarded Contractors and a number of national agencies will also be involved in executing and managing most aspects of this Project. These are Department of the Environment (DOE), Directorate of Land Records and District Deputy Commissioner offices if any land acquisition will be required, Zila Police Headquarters, and Bangladesh Water Board, etc. The overall responsibilities for implementing the environmental and social requirements outlined in this report are summarized in Table VIII-3.

**Table VIII-3: Responsibilities of Agencies for Safeguards Monitoring and Management**

| Project Activities Phase                | Responsible Organization   | Responsibilities   |
|---|--|--|
| Preliminary Design in Feasibility stage | Construction Supervision Consultant (CSC)                                  | Consideration of significant issues on environment and social aspects with mitigation measures into Engineering Designs of the Project |
| Detailed Engineering Design             | Construction Supervision Consultant (CSC)                                  | Incorporation of appropriate mitigation measures into Detailed Engineering Design and technical Specification.                         |
| Detailed Design                         | DoE/Environmental & Social Circle, RHD/ Bangladesh Water Development Board | Review and approve environmental mitigation and management measures.   |

|  |   |   |
|--|---|---|
| Detailed Design  | DOE   | Review the Project ESIA and provide Environmental Clearance Certificate for the Project.  |
| Pre-construction stage: Land Acquisition and Resettlement (Amendment, LARIPO 2017) | District DC offices of the Project influential zone   | Joint verification and payment of the Compensation money to the affected people   |
| Construction - stage   | Contractor's Environment, Health and Safety Officer and Construction Supervision Consultant (CSC) | Implementation of required environmental measures for occupational health and safety  |
|  | Site Engineer and Environmental Supervising Consultant of CSC                                     | Supervision the implementation of Contractor's environmental measures under the ESMP on a daily basis. Enforce Contractual requirements.  |
|  | Environmental Supervising Consultant of CSC and site Engineer                                     | Conduct the Environmental Audit during construction phase through environmental inspections and collection of monitoring data, submission of quarterly reports. Provision of training and technology transfer to staff. |
|  | DOE   | Ensure compliance with GOB legal requirements during construction.  |
| Operation  | CSC on behalf of RHD  | Undertake environmental monitoring and prepare quarterly reports. Provide budget to undertake environmental monitoring for 1 year after completion of Project   |

#### b. Project Management Unit (PMU)

286. A PMU has been established for the overall management of the project. The PMU is headed by Project Director (PD) supported by officials including others member. The PMU will receive support from environmental and Social specialist on the CSC team. Key tasks and responsibilities of the RHD Safeguard officer are as follows:

- confirm existing ESIA/ESMP are updated based on detailed designs, and that new ESIA/ESMP are prepared in accordance with the ESRF and project selection criteria related to safeguards;
- confirm whether ESIA/ESMPs are included in bidding documents and civil works contracts;
- provide oversight on environmental management aspects of project and ensure ESMPs are implemented by project implementation unit (PIU) and contractors;
- Site specific ESMP would be submitted by the contractor before start of the work" as a contract clause by PMU
- establish a system to monitor environmental safeguards of the project, including monitoring the indicators set out in the monitoring plan of the ESMP;
- facilitate and confirm overall compliance with all government rules and regulations regarding site and environmental clearances, as well as any other environmental requirements (e.g., location clearance certificates, environmental clearance certificates, etc.), as relevant;
- supervise and provide guidance to the PIUs to properly carry out the environmental and social monitoring and assessments as per the ESMP;
- review, monitor, and evaluate the effectiveness with which the ESMPs are implemented and recommend necessary corrective actions to be taken as necessary;
- consolidate monthly environmental monitoring reports from PMUs and submit semi-annual monitoring reports to AIIB;
- ensure timely disclosure of final ESIA/ESMPs in locations and form accessible to the public; and
- address any grievances brought about through the grievance redress mechanism in a timely manner.

### c. Construction Supervision Consultants (CSC)

287. Consultants will be retained to oversee the construction of the Project. As part of this Consultancy Contract, the responsibility of environmental Consultant is to monitor the environmental effects of the Project and to supervise the implementation of environmental mitigation measures. The specific environmental consultancy services envisaged are:

- The development of an environmental auditing protocol for the construction period, and the formulation of a detailed monitoring program;
- The regular monitoring and submission of quarterly reports to RHD and the donor.

### E. Budget for ESMP

288. Most of the mitigation measures require the contractors/project authority to adopt good site practice, which should be part of their normal procedures already, so there are unlikely to be major costs associated with compliance.

289. Mitigation that is the responsibility of RHD and contractors will be provided as part of their management of the project. The cost estimation for Environmental Mitigation Measures and Monitoring is given in the Table II-4. The total mitigation and monitoring cost for the project is calculated as BDT 22.5885 million or US\$ 0.27 million in addition to compliance to the clauses ..... of GCC of tender documents and ESMP to the entire satisfaction.

**Table VIII-4: Environmental Budget for Sylhet-Tamabil Road**

| ESMP Task No.                              | Mitigation and Monitoring Items  | Unit                                 | Cost/Unit | Total Unit | Total Cost (In BDT)  | Total Cost (million BDT) |
|--|--|--------------------------------------|-----------|------------|----------------------|--------------------------|
| <b>1.0</b>                                 | <b>Pre-construction Period</b>   |                                      |           |            |                      |                          |
| 1.1  | Obtaining of SCC/NOCs  | Included in Project Preparation Cost |           |            | 0                    |                          |
| 1.2  | Updating of ESMP   | Included in Project Preparation Cost |           |            | 0                    |                          |
| 1.3  | Existing Utilities   | Included in Engineering Cost         |           |            | 0                    |                          |
| 1.4  | Construction Camps, & Stock Yards  | Included in Engineering Cost         |           |            | 0                    |                          |
| 1.5  | Sources of Materials   | Included in Engineering Cost         |           |            | 0                    |                          |
| 1.6  | Technical Support; Update of Environmental guidelines and performance indicators | L/S                                  | -         | -          | 5,00,000             | 0.50                     |
| 1.7  | Dredged Material; Measuring dredged material quality                             | No.                                  | 20,000    | 2          | 40000                | 0.04                     |
| 1.8  | <b>Environmental Quality Test-Baseline</b>                                       |                                      |           |            |                      |                          |
|  | a. Air Quality Test  | No.                                  | 50000     | 2          | 100000               | 0.10                     |
|  | b. Noise Level Measurement   | No.                                  | 15000     | 4          | 60000                | 0.06                     |
|  | c. Soil Quality Test   | No.                                  | 40000     | 2          | 80000                | 0.08                     |
|  | d. Ground water Quality Test   | No.                                  | 20000     | 2          | 40000                | 0.04                     |
|  | e. Surface Water Quality Test  | No.                                  | 20000     | 2          | 40000                | 0.04                     |
|  | Flora; Clearing of Roadside plantation   | No of trees                          |           | 162077     | Covered in Eng. Cost | -                        |
| 1.9  | Land acquisition & resettlement; Compensation against land acquisition           | Covered in R & R Budget              |           |            |                      | -                        |
| <b>Sub Total (Pre-construction Period)</b> |  |                                      |           |            | <b>8,60,000</b>      | <b>0.86</b>              |
| <b>2.0</b>                                 | <b>Construction Period</b>   |                                      |           |            |                      |                          |
| 2.1  | Topography, landforms, geology and soils   | No.                                  | 40000     | 4          | 160000               | 0.16                     |
| 2.2  | Air quality  | No.                                  | 50000     | 8          | 400000               | 0.40                     |
| 2.3  | Noise & Vibration  | No.                                  | 15000     | 16         | 240000               | 0.24                     |

| ESMP Task No. | Mitigation and Monitoring Items   | Unit                        | Cost/Unit | Total Unit | Total Cost (In BDT) | Total Cost (million BDT) |
|---------------|---|-----------------------------|-----------|------------|---------------------|--------------------------|
| 2.4           | Surface Water quality   | No.                         | 20000     | 8          | 160000              | 0.16                     |
| 2.5           | Ground water quality  | No.                         | 20000     | 8          | 160000              | 0.16                     |
| 2.6           | <b>Flora</b> ; Compensatory a forestation (Minimum 1:5) (Plantation & maintenance for two years)  | No.                         | 300       | 20000      | 6000000             | 6.0                      |
| 2.7           | Installation of oil and grease traps at construction sites @ 1 per site and 1 site per construction package (3)   | No.                         | 60000     | 6          | 360000              | 0.36                     |
| 2.8           | Construction of soak pits at construction sites @ 2 per construction camp and 1 camp per package  | No.                         | 30000     | 4          | 120000              | 0.12                     |
| 2.9           | <b>Agriculture</b> ; Institutional support for enhancing agricultural productivity (Development of demonstration plots for change in cropping pattern for cash crop or high yield variety)  | Plots                       | 1,00,000  | 5          | 500000              | 0.50                     |
|               | <b>Technical Support to farmers</b>   | L/S                         | -         | -          | 500000              | 0.50                     |
| 2.10          | <b>Fisheries</b> ; Conversion of derelict pond into culture ponds & other support (fisheries seed distribution, demonstration ponds, technical support)   | L/S                         | -         | -          | 500000              | 0.50                     |
| 2.11          | <b>Drainage Congestion</b> ; Provision of adequate opening  | Covered in Engineering Cost |           |            |                     | -                        |
| 2.12          | <b>Erosion &amp; Sedimentation</b> ; River bank protection measures   | Covered in Engineering Cost |           |            |                     | -                        |
| 2.13          | <b>Soil</b> ; Maintenance cost in soil conservation   | Covered in Engineering Cost |           |            |                     | -                        |
| 2.14          | <b>Slope /Embankment protection at approach Road</b> ; Turfing of embankment with grasses and herbs   | Covered in Engineering Cost |           |            |                     | -                        |
| 2.15          | <b>Dust Management</b> ; Water sprayer / watering   | Covered in Engineering Cost |           |            |                     | -                        |
| 2.16          | <b>Waste disposal and management</b> ; Disposal and management of construction waste  | Lump-sum                    |           |            | 500000              | 0.50                     |
| 2.17          | <b>Traffic management</b> ; Road signage's and traffic directional signs  | Covered in Engineering Cost |           |            |                     | -                        |
| 2.18          | <b>Construction Safety</b> ; Workers health and safety Sanitation facilities (toilets for male and female worker) & electrical/ power facilities, water supply arrangement (potable water for drinking, ), Supply of Personal Protection Equipment (PPE) helmet, gloves, safety shoes & glass, safety signs, first aid box with necessary drugs, Fire extinguisher and sand fill bucket, Health and Safety training for | Lump-sum                    |           |            | 700000              | 0.70                     |

| ESMP Task No.  | Mitigation and Monitoring Items  | Unit   | Cost/Unit | Total Unit | Total Cost (In BDT) | Total Cost (million BDT) |   |
|--|--|--|-----------|------------|---------------------|--------------------------|---|
|  | workers etc. Health checkup camps for construction workers   |  |           |            |                     |                          |   |
|  | Accident risks in construction activity  | Covered in Engineering Cost/Insurance  |           |            |                     |                          | - |
| 2.19   | <b>Environmental Monitoring in construction phase;</b>   |  |           |            |                     |                          |   |
|  | Monitoring Tree Felling & Plantation   |  | Lump sum  |            | 500000              | 0.50                     |   |
|  | Fisheries  |  | Lump sum  |            | 300000              | 0.30                     |   |
| 2.20   | Post-construction clean-up   |  | Lump-sum  |            | 500000              | 0.50                     |   |
| <b>Sub Total (Construction Period)</b>   |  |  |           |            | <b>11600000</b>     | <b>11.6</b>              |   |
| 3.0  | <b>Operation Stage</b>   |  |           |            |                     |                          |   |
| 3.1  | <b>Air Quality;</b> Monitoring air quality   | No.  | 50000     | 3(1/year)  | 150000              | 0.15                     |   |
| 3.2  | <b>Noise;</b> Monitoring ambient noise level   | No.  | 15000     | 3(1/year)  | 45000               | 0.045                    |   |
| 3.3  | Monitoring surface water quality   | No.  | 20000     | 3(1/year)  | 60000               | 0.060                    |   |
|  | Monitoring ground water quality & levels   | No.  | 20000     | 3(1/year)  | 60000               | 0.060                    |   |
| 3.4  | <b>Fisheries;</b> Maintenance of Derelict Ponds or rehabilitation of Borrow Areas                        | Lump Sum   |           |            | 700000              | 0.70                     |   |
| 3.5  | <b>Tree survival;</b> Provision of additional tree plantation (Plantation and maintenance for two years) | No of trees  | 100/tree  | 2000       | 200000              | 0.20                     |   |
| 3.6  | <b>Monitoring of performance indicators</b>  |  |           |            |                     |                          |   |
|  | Monitoring tree felling & plantation   | Lump Sum   |           | -          | 400000              | 0.40                     |   |
|  | Fisheries  | Lump Sum   |           | -          | 400000              | 0.40                     |   |
|  | Monitoring of waste disposal and management  | Lump Sum   |           | -          | 400000              | 0.40                     |   |
| <b>Sub Total (Operation Period)</b>  |  |  |           |            | <b>2335000</b>      | <b>2.415</b>             |   |
| <b>ESTABLISHMENT &amp; TRAINING</b>  |  |  |           |            |                     |                          |   |
| <b>Establishment</b>   |  |  |           |            |                     |                          |   |
| Construction stage   | Per month  | 100000   |           | 24         | 2400000             | 2.40                     |   |
| Operation stage  | Per month  | 25,000 for first three years of operation and 15000 after three years additional two years |           | 60         | 1260000             | 1.26                     |   |
| <b>Training; Environmental training &amp; awareness</b>                                  | Lump Sum   | As per training details  |           |            | 1500000             | 1.50                     |   |
| Management Information System  | Lump Sum   |  |           |            | 500000              | 0.50                     |   |
| <b>Sub Total (ESTABLISHMENT &amp; TRAINING)</b>  |  |  |           |            | <b>5660000</b>      | <b>5.66</b>              |   |
| <b>SUB TOTAL (Pre-construction, Construction, Operation, establishment and training)</b> |  |  |           |            |                     | <b>20.535</b>            |   |
| <b>CONTINGENCIES @ 10 % on total Environmental Costs</b>                                 |  |  |           |            |                     | <b>2.0535</b>            |   |
| <b>GRAND TOTAL (in million BDT)</b>  |  |  |           |            |                     | <b>22.5885</b>           |   |
| <b>GRAND TOTAL (in million US\$) (@ 1 US\$ = 84.5 BDT)</b>                               |  |  |           |            |                     | <b>0.27</b>              |   |

Note: Cost of the ESMP items should be as variable budget

## F. Monitoring and Reporting

290. RHD and CSC will monitor and measure the progress of ESMP implementation. The monitoring activities will correspond with the project's risks and impacts, and will be identified in the IEE/ESIA for the project road. In addition to recording information on the work and deviation of work components from original scope PMU, CSC will undertake site inspections and document review to verify compliance with the ESMP and progress toward the final outcome. Corrective actions to be taken quickly and reported in monitoring reports.

291. Contractor shall submit monthly Environmental and Social Monitoring Report covering the mitigation measures listed in this ESMP for all the project road to the CSC for approval.

292. CSC will submit monthly monitoring and implementation reports to PMU, who will take follow-up actions, if necessary. PMU will submit semi-annual monitoring reports to AIIB. The suggested monitoring report format is in AIIB. Project budgets will reflect the costs of monitoring and reporting requirements. For projects likely to have significant adverse environmental impacts during operation, reporting will continue at the minimum on an annual basis. Monitoring reports will be posted in a location accessible to the public.

293. AIIB will review project performance against the commitments as agreed in the legal documents. The extent of AIIB monitoring and supervision activities will be commensurate with the project's risks and impacts. Monitoring and supervising of social and environmental safeguards will be integrated into the project performance management system. AIIB will monitor projects on an ongoing basis until a project completion report is issued. AIIB will carry out the following monitoring actions to supervise project implementation:

- i. conduct periodic site visits for projects with adverse environmental or social impacts;
- ii. conduct supervision missions with detailed review by AIIB safeguard specialists/officers or consultants for projects with significant adverse social or environmental impacts;
- iii. review the periodic monitoring reports submitted by ESAs to ensure that adverse impacts and risks are mitigated, as planned and as agreed with AIIB;
- iv. work with ESAs to rectify to the extent possible any failures to comply with their safeguard commitments, as covenanted in the legal agreements, and exercise remedies to re-establish compliance as appropriate; and
- v. Prepare a project completion report that assesses whether the objective and desired outcomes of the safeguard plans have been achieved, taking into account the baseline conditions and the results of monitoring.

## IX. CONCLUSION AND RECOMMENDATIONS

294. The proposed road is an existing alignment that will improve connectivity between offer continued access road of the entrance, foot over bridge, bridge, culvert, SMVT, Toll plaza etc. However, the new alimnet from Jaintaput- Tamabil. The proposed road is classified an environment category “red” due to potential adverse impacts and present no cross the forests and habitats located the project area.

295. The majority of impacts during the construction period will be mitigated by good construction housekeeping measures by the contractor. There will be standard procedures for Othe control and mitigation of emissions, such as dust, noise, exhaust fumes and liquid discharges from the construction sites, depots and work camps. All construction activities close to river will be controlled and the rivers will be protected from contamination. Wastewater from construction camps will be treated on site in settlement and aeration basins, where biological waste will be processed, before discharge. Septic sludge from toilets will be trucked to existing water treatment plants. Solid Waste will be disposed offsite in approved and managed waste disposal sites. Ground water is not expected to be impacted by the project, as no deep excavations or major cuts for new roads and other developments are necessary. Water for the construction activities as well as the camps will be extracted in relatively small quantities from existing wells or the public supply system. Generally, water availability is unconstrained in the project area.

296. Noise and exhaust emissions will be minimized by the requirement for Contractors to use modern equipment and machinery complying with modern emission standards, and to maintain the equipment in good working order throughout the project. This will be prescribed in the equipment specifications in the tender documents. Nuisance to the public will be minimized by limiting work hours, with no nighttime works near housing and other sensitive uses. Where works are carried out in close vicinity to existing residential areas additional measures, such as noise barriers or the installation of insulating windows will be considered in accordance with good practice and in consultation with the community.

297. Construction material (hardcore, sand, spoil soil etc) will be obtained from a variety of borrow pits that are not operated by the Contractors. However, in accordance with the ESMP all borrow pit must be approved by the supervision consultants (who will ensure that international good practice is followed). Construction access routes will be agreed prior to construction start and will not disturb any sensitive uses.

298. Flora and fauna will be impacted during the construction period but significant changes to the natural environment have already taken place close to the road and impacts to key species of concern are expected to be low. There are no forest areas or other sensitive areas near the alignment. However, there will be significant loss of trees, and there will be a major social reforestation program in line with standard RHD policies. No cultural or physical resources will be affected. Some sensitive uses will be impacted.

299. There will be some displacement of existing residents. Initial consultation with the community has taken place as part of the Resettlement Action Plan and this will continue during the Field visit and RAP stages. Consultation with the community will take place in connection with the preparation of the ESIA during the RAP stage.

300. This ESIA has included an Environmental and Social Management Plan (ESMP) for the construction and operation periods which should be approved by RHD. A monitoring program has also been prepared as part of the ESMP. The ESMP will be incorporated into the tender documents and will become part of the works contracts. The Contractors will be required to have permanent staff on site with the specific responsibilities of environmental and social management, reporting to the supervision engineers and their environmental and social specialists, and to the local authorities.

301. In summary, the project will have an overall beneficial impact after completion in terms of reducing transport cost and fuel consumption of vehicles and also improving socioeconomic conditions along the project road. It will have insignificant negative impact on air quality, noise level, watercourses and soil during civil works, which will be appropriately monitored and adequately mitigated. At present, this report has not identified any comprehensive, broad, diverse or irreversible adverse impacts caused by the proposed road project.

## APPENDIX

### Appendix 1: Existing Environmental Standards

#### ENVIRONMENTAL QUALITY STANDARDS IN BANGLADESH (According to Bangladesh Conservation Rules, 1997)

#### 1 AIR POLLUTION STANDARDS

##### 1.1 Ambient Air Quality Standards for Different Categories of Environment

| Category of Environment    | Concentration, |                 |      |     |
|----------------------------|----------------|-----------------|------|-----|
|                            | SPM            | SO <sub>4</sub> | CO   | Nox |
| • Industrial and mixed use | 500            | 120             | 5000 | 100 |
| • Commercial and mixed use | 400            | 100             | 5000 | 100 |
| • Residential and rural    | 200            | 80              | 2000 | 80  |
| • Sensitive                | 100            | 30              | 1000 | 30  |

- Note:**
1. Sensitive areas include national monuments, health resorts, hospitals, and archaeological, sport, and educational institutions
  2. Any industrial unit located not in a designated industrial area will not discharge such pollutants which can cause to exceed the ambient air quality prescribed above in the surrounding areas for the categories 'residential and rural' and sensitive'.
  3. Suspended particulate matter refers to airborne particulate of 10µm or less in diameter
  4. The above values correspond to the maximum permissible amounts/concentrations to be present in randomly sampled air.

##### 1.2 Standard Values for Motor Vehicle Exhaust

| Parameters/Determinants | Unit                               | Standard value |
|-------------------------|------------------------------------|----------------|
| - Black smoke (1)       | Hatridge Smoke Unit (HSU)          | 65 (3)         |
| - CO (2)                | g/m <sup>3</sup><br>percent volume | 24<br>4 (4)    |
| - Hydrocarbon (2)       | g/m <sup>3</sup><br>Ppm            | 2<br>180       |
| - NO <sub>x</sub> (2)   | g/m <sup>3</sup><br>Ppm            | 2<br>600       |

- Note:**
- (1) measured at two-thirds of maximum rotating speed
  - (2) whichever is lower out to two values expressed in two different units
  - (3) for vehicles more than 5 years old, or have completed 80,000 km the standard value is 75 HSU
  - (4) two and three-wheeler vehicles with engine displacement less than 50cm the standard value is 5 volume percentage, for other two and three wheelers 4.5 volume percentage.

(1) When measured, the motor vehicles should be stationary and engine conditions are as follows:

- For diesel engine: at maximum rotating speed
- For gasoline engine: no-load acceleration at ¾ of maximum rotating speed
- For motor cycles: when maximum rotation speed is more than 5000 RPM, measure at ½ maximum rotating speed, when less than 5000 RPM at ¾ of maximum rotating speed.

## 1. NOISE POLLUTION STANDARDS

### 2.1 Emission Standards set for Noise Pollution for the different Land Use

| Areas Category (*) | Unit  | Standard Value |            |
|--------------------|-------|----------------|------------|
|                    |       | Day Time       | Night Time |
| A                  | dB(A) | 45             | 3          |
| B                  | dB(A) | 50             | 5          |
| C                  | dB(A) | 60             | 4          |
| D                  | dB(A) | 70             | 0          |
| E                  | B(A)  | 75             | 5          |

A: areas where quietness is specially required, such as where there is a concentration of convalescence facilities (hospitals) and educational institutions.

B: areas which are used mainly for residential purposes.

C: areas which are considerably used for residential purposes and which are also destined for commercial and industrial purposes.

D: commercial areas.

E: industrial areas.

#### Note

2. The maximum allowable limit in the working place is 90dB(A) when working up to 8 hours per day. When working for more than 8 hours the maximum allowable limit is set at 85dB(A).

3. Earplugs and ear muffs shall be provided by the plant manager/owner to workers who work in a work place with noise levels exceeding 85dB(A).

## 4. WATER QUALITY STANDARDS

### 4.1 Standard values for Wastewater Discharged from Industry or Project

| Parameter/Determinant                       | Unit | Standard                    |                             |                              |
|---|------|-----------------------------|-----------------------------|------------------------------|
|   |      | Discharge into Inland Water | Discharge into Public Sewer | Discharge on Land/Irrigation |
| · Ammonia (NH <sub>3</sub> )                | mg/l | 5                           | 5                           | 15                           |
| · Ammonical nitrogen (as N)                 | mg/l | 50                          | 75                          | 75                           |
| · arsenic                                   | mg/l | 0.2                         | 0.05                        | 0.2                          |
| · BOD                                       | mg/l | 50                          | 250                         | 500                          |
| · boron                                     | mg/l | 2.0                         | 2.0                         | 2.0                          |
| · cadmium                                   | mg/l | 0.05                        | 0.5                         | 0.5                          |
| · carbon dioxide (dissolved)                | mg/l | 3                           | 5                           | na                           |
| · chloride                                  | mg/l | 600                         | 600                         | 600                          |
| · chromium (as Cr <sup>6+</sup> )           | mg/l | 0.1                         | 1.0                         | 1.0                          |
| · chromium (total)                          | mg/l | 0.5                         | 1.0                         | 1.0                          |
| · chromium (6+)                             | mg/l | 200                         | 400                         | 400                          |
| · COD                                       | mg/l | 0.5                         | 3.0                         | 3.0                          |
| · Copper                                    | mg/l | 4.5-8                       | 4.5-8                       | 4.5-8                        |
| · Dissolved oxygen                          | cm   | 1200                        | 1200                        | 1200                         |
| · electroconductivity                       | cm   | 2                           | 15                          | 10                           |
| · fluoride (as F <sup>-</sup> )             | mg/l | 1                           | 2                           | 1                            |
| · hydrogensulphide                          | mg/l | 2                           | 2                           | 2                            |
| · Iron                                      | mg/l | 100                         | 100                         | 100                          |
| · Total Kjeldahl Nitrogen (N <sub>2</sub> ) | mg/l | 0.1                         | 0.1                         | 0.1                          |
| · Lead                                      | mg/l | 5                           | 5                           | 5                            |
| · Manganese                                 | mg/l | 1.0                         | 0.01                        | 0.01                         |
| · Mercury                                   | mg/l | 1.0                         | 2.0                         | 1.0                          |
| · Nickel                                    | mg/l | 10.0                        | na                          | 10                           |
| · Nitrate (N <sub>2</sub> )                 | mg/l | 10.0                        | 20                          | 10                           |
| · Oil and grease                            | mg/l | 1.0                         | 5                           | 1                            |
| · Phenol                                    | ?    | 8.0                         | 8                           | 15                           |
| · Dissolved phosphorus                      |      | to be decided               | 8                           | 1                            |
|   |      | 6-9                         | 6-9                         | 6-9                          |

| Parameter/Determinant    | Unit | Standard                    |                             |                              |
|--------------------------|------|-----------------------------|-----------------------------|------------------------------|
|                          |      | Discharge into Inland Water | Discharge into Public Sewer | Discharge on Land/Irrigation |
| (P)                      | -    | 0.05                        | 0.05                        | 0.05                         |
| . Radioactive matter     | mg/l | 5.0                         | 10.0                        | 10.0                         |
|                          | mg/l | 2,100                       | 2,100                       | 2,100                        |
| . pH                     | mg/l | 40-45                       | 40-45                       | 40-45                        |
| . Selenium               | °C   | 150                         | 500                         | 200                          |
| . Zinc                   | mg/l | 0.1                         | 2.0                         | 0.2                          |
| . Total dissolved solids | mg/l |                             |                             |                              |
| . TESMPerature           |      |                             |                             |                              |
| . Suspended solids       |      |                             |                             |                              |
| . cyanide (asCN)         |      |                             |                             |                              |

na: no value established

#### 4.2 Standard Values for (Domestic) Sewage Effluent

| Parameters/Determinants | Unit    | Standard |
|-------------------------|---------|----------|
| BOD                     | mg/1    | 40       |
| Nitrate                 | mg/1    | 250      |
| Phosphate               | mg/1    | 35       |
| Suspended solids        | mg/1    | 100      |
| TESMP erasure           | °C      | 30       |
| Coli form count         | n/100m1 | 1000     |

**Note:** 1. These standard values are applicable for discharging into surface water and inland streams  
Sewage effluent should be chlorinated before final discharge.

5.

#### 5.1 Quality Standards for Surface Water

| Use Class   | Parameter/Determinant |             |            |                                      |
|---|-----------------------|-------------|------------|--------------------------------------|
|   | PH                    | BOD (Mg/l)  | DO (mg/l)  | Total Coliform bacteria (No./100 ml) |
| 1. Drinking Water Sources, only after supplied as bacteria free             | 6.5-8.5               | 2 or below  | 6 or above | 50 or below                          |
| 2. Use of water for Recreational Classes                                    | 6.5-8.5               | 3 or below  | 5 or above | 200 or below                         |
| 3. Drinking water source for supplied after traditional treatment           | 6.5-8.5               | 3 or below  | 6 or above | 5000 or below                        |
| 4. Use of water for fish  | 6.5-8.5               | 6 or below  | 5 or above | 5000 or below                        |
| 5. Use of water for different processing and cooling purposes in industries | 6.5-8.5               | 10 or below | 5 or above | -                                    |
| 6. Use of water for irrigation purposes                                     | 6.5-8.5               | 10 or below | 5 or above | 1000 or below                        |

#### 5.2 Water Quality Standards for Drinking Water

| Parameter/Determinant | Unit | Standard |
|-----------------------|------|----------|
| • Aluminium           | mg/1 | 0.2      |
| • Ammonia             | mg/1 | 0.5      |
| • Arsenic             | mg/1 | 0.05     |
| • Barium              | mg/1 | 0.5      |
| • Benzene             | mg/1 | 0.01     |
| • BOD                 | mg/1 | 0.2      |
| • Boron               | mg/1 | 1        |
| • Cadmium             | mg/1 | 0.005    |
| • Calcium             | mg/1 | 75       |

| Parameter/Determinant                        | Unit    | Standard   |
|--|---------|------------|
| • Chloride                                   | mg/l    | 150-600    |
| • Chlorinated alkenes                        |         |            |
| • Carbon tetrachloride                       | mg/l    | 0.01       |
| - 1,1dichloroethelene                        | mg/l    | 0.001      |
| - 1,2dichloroethelene                        | mg/l    | 0.03       |
| - tetrachlor ethylene                        | mg/l    | 0.03       |
| - trichloroethylene                          | mg/l    | 0.09       |
| • Chlorinated phenols                        | mg/l    |            |
| - pentachlorophenol                          | mg/l    | 0.03       |
| - 1,4,6 ttrichlorophenol                     | mg/l    | 0.03       |
| • Chlorine(residual)                         | mg/l    | 0.2        |
| • Chloroform                                 | mg/l    | 0.09       |
| • Chromium (asCr <sup>6+</sup> )             | mg/l    | 0.05       |
| • Chromium(total)                            | mg/l    | 0.05       |
| • COD  | mg/l    | 4          |
| • Coliforms(faecal)                          | mg/l    | 0          |
| • Coliforms(total)                           | mg/l    | 2*         |
| • Colour                                     | mg/l    | 15         |
| • Copper                                     | mg/l    | 1          |
| • Cynnide (asCN)                             | n/100ml | 0.1        |
| • Detergents                                 | n/100ml | 0.2        |
| • Dissolvedoxygen                            | Hazen   | 6**        |
| • Fluoride (asF)                             | mg/l    | 1          |
| • Hardness (asCoCo <sub>3</sub> )            | mg/l    | 200-500    |
| • Iron                                       | mg/l    | 0.3-1      |
| • Kjeldahlnitrogen                           | mg/l    | 1          |
| • Lead                                       | mg/l    | 0.05       |
| • Magnesium                                  |         | 30-50      |
| • Manganese                                  | mg/l    | 0.1        |
| • Mercury                                    | mg/l    | 0.001      |
| • Nickel                                     | mg/l    | 0.1        |
| • Nitrate (asN)                              | mg/l    | 10         |
| • Nitrate (asNO <sub>2</sub> )               | mg/l    | <1         |
| • Odour                                      | mg/l    | odourless  |
| • Oil andgrease                              |         | 0.01       |
| • Organophosphcompounds                      |         |            |
| • Aldrin&dieldrin                            | mg/l    | 0          |
| • Chlordane                                  | mg/l    | 0          |
| • DDT  | mg/l    | 0          |
| • Hexachlorobenzene                          | mg/l    | 0          |
| • Heptachlor                                 | mg/l    | 0          |
| • Heptachorepoxide                           |         | 0          |
| • Lindane                                    | mg/l    | 0.003      |
| • Methozychlor                               | mg/l    | 0.03       |
| • 2,4,D                                      | mg/l    | 0.1        |
| • pH   |         | 6.5 to 8.5 |
| • Phenoliccompounds                          | mg/l    | 0.002      |
| • Phosphate                                  | mg/l    | 6          |
| • Phosphorous                                | mg/l    | 0          |
| • Potassium                                  | mg/l    | 12         |
| • Radioactivematerials                       |         |            |
| • Grossa-activity                            | bq/l    | 0.01       |
| • Grossb/g-activity                          | bq/l    | 0.1        |
| • Selenium                                   | mg/l    | 0.01       |
| • Silver                                     | mg/l    | 0.02       |
| • Sodium                                     | mg/l    | 200        |
| • Suspendedsediment                          | mg/l    | 10         |
| • Sulphide (asS)                             | mg/l    | 0          |
| • Sulfate (asSO <sub>4</sub> <sup>2-</sup> ) | mg/l    | 400        |
| • Tar  | mg/l    | 0          |
| • Taste                                      | mg/l    | not        |
| • Total dissolvedsolids                      | mg/l    | 1000       |
| • TESMPerature                               | °C      | 20-30      |

| Parameter/Determinant | Unit  | Standard |
|-----------------------|-------|----------|
| • Tin                 | mg/l  | 2        |
| • Turbidity           | J.T.U | 10       |
| • Zine                | mg/l  | 5        |

na: not yet defined

\* per 100ml in two consecutive samples

\*\* desirable limit for drinking water

**Note:** where a range is mentioned the lower value may be used for warning and the higher value for initiation of corrective measures.

## Appendix 2: Assessment of Key Species of Concern

| IUCN Status | Scientific Name        | Common Name                 | Group  | Reason for including as Species of Concern                              | Reason for excluding as Species of Concern  |
|-------------|------------------------|-----------------------------|--------|---|---|
| CR          | Axis porcinus          | Hog deer                    | Mammal | Habitat consists of wet tall grasslands                                 |   |
| EN          | Cuonalpinus            | Dhole                       | Mammal |   | Prefer forested areas and thought to occur in the hill districts of Sylhet                                |
| EN          | Elephas maximus        | Asian elephant              | Mammal |   | Occasionally wild elephants from India may enter the Patharika areas of Sylhet but are no longer resident |
| EN          | Hoolock hoolock        | Western hoolock gibbon      | Mammal |   | Aboreal primates found in forested areas  |
| EN          | Manis crassicaudata    | Indian pangolin             | Mammal |   | Found in the forests of Sylhet  |
| EN          | Platanista gangetica   | South asian river dolphin   | Mammal |   | Found in rivers Padma, Jamuna, and Meghna; Surma river is too low in dry season to support dolphin        |
| EN          | Trachypithecusphayrei  | Phayreâs leaf-monkey        | Mammal |   | Sometimes seen in tea plantations but reside in forests of Sylhet   |
| EN          | Aonyxcinereus          | Asian small-clawed otter    | Mammal | Inhabits wetland systems  |   |
| VU          | Arctictis binturong    | Binturong                   | Mammal |   | Found in the forests of Sylhet  |
| VU          | Arctonyxcollaris       | Greater hog badger          | Mammal | Recorded in tea gardens around Sylhet; IUCN lists roads as a key threat |   |
| VU          | Helarctosmalayanus     | Sun bear                    | Mammal |   | Occurs in forest habitats but only recently sighted in Chittagong Hil Tracts                              |
| VU          | Lutrogaleperspicillata | Smooth-coated otter         | Mammal | Inhabits wetland systems  |   |
| VU          | Macacaarctoides        | Stump-tailed macaque        | Mammal |   | Only found in forested areas and thought to be extinct in Bangladesh                                      |
| VU          | Macacaleonina          | Northern pig-tailed macaque | Mammal |   | Found in the forests of Sylhet  |
| VU          | Melursus ursinus       | Sloth bear                  | Mammal |   | Not spotted since the 1970s and thought to no longer exist in Bangladesh                                  |

| IUCN Status | Scientific Name               | Common Name          | Group   | Reason for including as Species of Concern   | Reason for excluding as Species of Concern                                    |
|-------------|-------------------------------|----------------------|---------|--|---|
| VU          | <i>Naemorhedus griseus</i>    | Chinese goral        | Mammal  |  | Found in forested and rocky, mountain areas; presence uncertain in Bangladesh |
| VU          | <i>Neofelisnebulosa</i>       | Clouded leopard      | Mammal  |  | Found in forested areas and last seen in 2009 in Chittagong                   |
| VU          | <i>Nycticebusbengalensis</i>  | Bengal slow loris    | Mammal  |  | Found in evergreen forests of Sylhet  |
| VU          | <i>Panthera pardus</i>        | Leopard              | Mammal  | Seen in Khadimnagar Park and has been included because it is free-ranging; however, habitat impacts are not expected |   |
| VU          | <i>Prionailurusviverrinus</i> | Fishing cat          | Mammal  | Inhabits wetland systems   |   |
| VU          | <i>Rusa unicolor</i>          | Sambar               | Mammal  |  | Found in evergreen forests of Sylhet  |
| VU          | <i>Trachypithecuspileatus</i> | Capped langur        | Mammal  |  | Found in forested areas   |
| VU          | <i>Ursusthibetanus</i>        | Asiatic black bear   | Mammal  | Considered rare, but it has been included because it is free-ranging; IUCN lists roads a key threat                  |   |
| CR          | <i>Indotestudoelongata</i>    | Elongated tortoise   | Reptile |  | Found in forested areas in the hills surrounding Sylhet                       |
| CR          | <i>Manouriaemys</i>           | Asian giant tortoise | Reptile |  | Exclusively inhabits forested areas   |
| EN          | <i>Cuoramouhotii</i>          | Keeled box turtle    | Reptile | Inhabits wetland systems   |   |
| EN          | <i>Geoclemyshamiltonii</i>    | Spotted pond turtle  | Reptile | Inhabits wetland systems   |   |
| VU          | <i>Crocodyluspalustris</i>    | Mugger               | Reptile |  | Found only in the Shrine of Shaikh Jalaluddin Hz. Shah Jalal                  |
| VU          | <i>Ophiophagus Hannah</i>     | King cobra           | Reptile | Found in a range of habitats, including wetlands and agricultural land   |   |
| VU          | <i>Python bivittatus</i>      | Burmese python       | Reptile | Found in a range of habitats, including wetlands and agricultural land   |   |
| CR          | <i>Ardea insignis</i>         | White-bellied heron  | Bird    | Listed by IUCN as potentially extinct but included because it inhabits wetlands                                      |   |
| CR          | <i>Aythya baeri</i>           | Baer's pochard       | Bird    | Full migrant (non-breeding) in Bangladesh  |   |

| IUCN Status | Scientific Name                | Common Name             | Group | Reason for including as Species of Concern  | Reason for excluding as Species of Concern                          |
|-------------|--------------------------------|-------------------------|-------|---|---|
| CR          | <i>Emberiza aureola</i>        | Yellow-breasted bunting | Bird  | Full migrant (non-breeding) in Bangladesh   |   |
| CR          | <i>Gyps bengalensis</i>        | White-rumped vulture    | Bird  | Feeds on carrion  |   |
| CR          | <i>Gyps tenuirostris</i>       | Slender-billed vulture  | Bird  | Feeds on carrion  |   |
| CR          | <i>Houbaropsis bengalensis</i> | Bengal florican         | Bird  | Listed by IUCN as potentially extinct but included because it inhabits lowland dry or seasonally inundated grasslands                     |   |
| CR          | <i>Sarcogyps calvus</i>        | Red-headed vulture      | Bird  | Feeds on carrion  |   |
| EN          | <i>Aquila nipalensis</i>       | Steppe eagle            | Bird  |   | Inhabits rocky areas, grassland and savanna; feeds on small mammals |
| EN          | <i>Asarcornis scutulata</i>    | White-winged duck       | Bird  | Non-migratory resident in Bangladesh  |   |
| EN          | <i>Haliaeetus leucoryphus</i>  | Pallas's fish-eagle     | Bird  | Generally nests in trees near water; breeding population in Bangladesh  |   |
| EN          | <i>Laticillacinera scens</i>   | Swamp grass-babbler     | Bird  | Not a migrant; found in long grasslands, sometimes where mixed with acacias and tamarisks   |   |
| EN          | <i>Leptoptilos dubius</i>      | Greater adjutant        | Bird  | Inhabits wetlands, nesting in tall trees  |   |
| EN          | <i>Perdiculamanipurensis</i>   | Manipur bush-quail      | Bird  | IUCN lists presence as uncertain in Bangladesh, but it is included because it inhabits stands of tall grass and sometimes bogs and swamps |   |
| EN          | <i>Sterna acuticauda</i>       | Black-bellied tern      | Bird  | Non-migratory resident in Bangladesh  |   |
| VU          | <i>Aceros nipalensis</i>       | Rufous-necked hornbill  | Bird  |   | Inhabits forested areas and is a significant frugivore              |
| VU          | <i>Apus acuticauda</i>         | Dark-rumped swift       | Bird  |   | Inhabits forested areas, rocky cliffs and deep gorges               |

| IUCN Status | Scientific Name                  | Common Name            | Group | Reason for including as Species of Concern   | Reason for excluding as Species of Concern   |
|-------------|----------------------------------|------------------------|-------|--|--|
| VU          | <i>Aythyaferina</i>              | Common pochard         | Bird  | Habitat includes swamps, marshes, lakes and slow-flowing rivers  |  |
| VU          | <i>Bucerosbicornis</i>           | Great hornbill         | Bird  |  | Inhabits forests and ranges out into open deciduous areas to visit fruit trees                   |
| VU          | <i>Chaetornisstriata</i>         | Bristled grassbird     | Bird  | Totally dependent on tall, dense grassland with wet soils, particularly in riverine and swampy areas   |  |
| VU          | <i>Clangaclanga</i>              | Greater spotted eagle  | Bird  | Occurs in lowland forests near wetlands, nesting in trees and hunting over swamps.   |  |
| VU          | <i>Clangahastata</i>             | Indian spotted eagle   | Bird  | Favours open habitats such as agriculture, wetlands and forest clearings   |  |
| VU          | <i>Columba punicea</i>           | Pale-capped pigeon     | Bird  | Non-migratory resident in Bangladesh   |  |
| VU          | <i>Francolinusgularis</i>        | Swamp francolin        | Bird  | Inhabits tall, wet grasslands; in modified areas, some natural grassland habitat associated with wet areas is critical                           |  |
| VU          | <i>Gallinagonemorica</i>         | Wood snipe             | Bird  | Full migrant where it frequents swampy ground in the winter  |  |
| VU          | <i>Leptoptilosjavanicus</i>      | Lesser adjutant        | Bird  | Inhabits wetlands, both open and forested  |  |
| VU          | <i>Mulleripicuspulverulentus</i> | Great slaty woodpecker | Bird  | Inhabits primary forest as well as adjacent secondary forest   |  |
| VU          | <i>Pellorneumpalustre</i>        | Marsh babbler          | Bird  | Resident in extensive reedbeds and tall grass, sometimes mixed with scrub and scattered trees, on marshy ground or adjacent to swamps and rivers |  |
| VU          | <i>Rhyticerosundulatus</i>       | Wreathed hornbill      | Bird  |  | Prefers forested areas and generally avoids disturbed habitats and proximity to human population |

| IUCN Status | Scientific Name                 | Common Name                 | Group | Reason for including as Species of Concern | Reason for excluding as Species of Concern  |
|-------------|---------------------------------|-----------------------------|-------|--|---|
| VU          | <i>Sittaformosa</i>             | Beautiful nuthatch          | Bird  |  | Prefers forested areas and generally does not inhabit areas lower than 300 m in the eastern Himalayas |
| VU          | <i>Spelaeornislongicaudatus</i> | Tawny-breasted wren-babbler | Bird  |  | Favors ravines and steep, rocky, boulder-strewn hillsides   |

**Appendix 3: Trees and Sensitive Use Survey Data**

Results of roadside trees survey and land use survey of a corridor of approximately 20 meters from edge of existing Sylhet-Tamabil Road carriageway,

## a, Road side Trees

| Name of Trees | Size of Trees |              |              |             | Total         |
|---------------|---------------|--------------|--------------|-------------|---------------|
|               | Large         | Medium       | Small        | Sapling     |               |
| Mahogany      | 5742          | 13402        | 26803        | 1915        | 47862         |
| Supri         | 2820          | 4937         | 9873         | 0           | 17630         |
| Bamboo        | 0             | 49109        | 0            | 0           | 49109         |
| Coconut       | 779           | 645          | 332          | 196         | 1952          |
| Banana        | 2675          | 3577         | 1573         | 0           | 7825          |
| Boroi         | 136           | 240          | 480          | 0           | 856           |
| Koroi         | 5673          | 6284         | 6892         | 1419        | 20268         |
| Jack Fruit    | 797           | 631          | 613          | 0           | 2041          |
| Mango         | 188           | 1523         | 843          | 164         | 2718          |
| Akasmoni      | 577           | 1352         | 2703         | 194         | 4826          |
| Debdaru       | 150           | 382          | 2516         | 763         | 3811          |
| Banyan        | 1             | 4            | 8            | 0           | 13            |
| Tamarind      | 4             | 26           | 11           | 2           | 43            |
| Shishu        | 7             | 44           | 22           | 4           | 77            |
| Guava         | 11            | 27           | 54           | 4           | 96            |
| Babla         | 5             | 16           | 31           | 3           | 55            |
| Other Timber  | 216           | 693          | 1030         | 40          | 1979          |
| Papaya        | 2             | 292          | 409          | 27          | 730           |
| Segun         | 1             | 30           | 15           | 2           | 48            |
| Neem          | 3             | 0            | 12           | 6           | 21            |
| Krishnochura  | 0             | 0            | 2            | 1           | 3             |
| Date          | 10            | 25           | 50           | 4           | 89            |
| jambura       | 3             | 7            | 14           | 1           | 25            |
| <b>Total</b>  | <b>19800</b>  | <b>83246</b> | <b>54286</b> | <b>4745</b> | <b>162077</b> |

## b, List of Religious, School/Madrasha, Hospital, and Graves/Graveyards

| Chainage            | School/College | Graveyard | Hospital/<br>Clinic | Sub-<br>station<br>(Power) | Religious<br>Structure<br>(Mosjid/Madrasha<br>etc) | Remarks   |
|---------------------|----------------|-----------|---------------------|----------------------------|--|---|
| 284 +500 - 283 +500 | 0              | 1         | 0                   | 0                          | 1  |   |
| 283 +500 - 282 +500 | 0              | 0         | 0                   | 0                          | 1  |   |
| 282 +500 - 281 +500 | 0              | 0         | 0                   | 0                          | 2  | 1 mosque & 1<br>madrasha  |
| 281 +500 - 280 +500 | 0              | 0         | 0                   | 0                          | 1  |   |
| 278 +500 - 277 +500 | 0              | 0         | 0                   | 0                          | 2  |   |
| 276 +500 - 275 +500 | 0              | 1         | 0                   | 0                          | 3  |   |
| 275 +500 - 274 +500 | 0              | 0         | 0                   | 0                          | 2  |   |
| 273 +500 - 272 +500 | 0              | 0         | 0                   | 0                          | 1  |   |
| 271 +500 - 270 +500 | 1              | 0         | 0                   | 1                          | 1  |   |
| 266 +500 - 265 +500 | 0              | 1         | 0                   | 0                          | 1  |   |
| 265 +500 - 264 +500 | 1              | 1         | 0                   | 0                          | 4  | 1 Madrasha & 1<br>Eidgah  |
| 263 +500 - 262 +500 | 1              | 0         | 2                   | 0                          | 1  |   |
| 262 +500 - 261 +500 | 1              | 0         | 0                   | 0                          | 1  |   |
| 260 +500 - 259 +500 | 0              | 0         | 0                   | 0                          | 1  |   |
| 254 +500 - 253+500  | 1              | 0         | 0                   | 0                          | 2  | Only Gate &<br>Boundary will<br>be affected for<br>one Madrasha |
| 252 +500 - 251+500  | 1              | 0         | 1                   | 0                          | 1  |   |
| 251 +500 - 250+500  | 1              | 0         | 0                   | 0                          | 1  |   |
| 251 +500 - 249+500  | 1              | 0         | 0                   | 0                          | 2  |   |
| 249 +500 - 248+500  | 1              | 1         | 1                   | 0                          | 1  |   |
| 248 +500 - 247+500  | 0              | 0         | 0                   | 0                          | 2  |   |
| 247 +500 - 246+500  | 0              | 0         | 0                   | 0                          | 2  | Only Gate &<br>Boundary will<br>be affected for<br>one Madrasha |
| 246 +500 - 245+500  | 0              | 0         | 0                   | 1                          | 1  |   |
| 245 +500 - 244+500  | 4              | 0         | 0                   | 0                          | 1  |   |
| 244 +500 - 243+500  | 0              | 0         | 0                   | 0                          | 1  |   |
| 243 +500 - 242+500  | 1              | 0         | 0                   | 0                          | 2  | Only Gate will<br>be affected                                   |
| 242 +500 - 241+500  | 1              | 0         | 0                   | 0                          | 1  | Only Gate will<br>be affected                                   |
| 241 +500 - 240+500  | 2              | 0         | 0                   | 0                          | 0  |   |
| 238+500 - 239+500   | 0              | 0         | 0                   | 0                          | 1  |   |
| 234 +500 - 233+500  | 1              | 0         | 0                   | 0                          | 0  |   |
| Total               | 18             | 5         | 4                   | 2                          | 40   |   |

Source: Inventory of Road September, 2019

## c, List of different sizes Markets at the Roadsides

| Name of Bazar                 | Bazar size |
|-------------------------------|------------|
| Dashpara Bazar (Khadim Nagar) | Medium     |
| Porgona Bazar                 | Small      |
| Pirer Bazar                   | Small      |
| Boteshar Bazar                | Medium     |
| Sukrabari Bazar               | Small      |
| Haripur Bazar                 | Medium     |
| Jaintapur Bazar               | Large      |
| Baghar Sarak Bazar            | Small      |
| Domari Bazar                  | Small      |
| Darbosto Bazar                | Medium     |
| 4no Bangla Bazar              | Medium     |

Note: Length of Small size bazars 100-200 meter (approx.), Medium size bazars >200-400meter (approx.) and Big size bazars >400-800 meter (approx.).

## Appendix 4: Air Quality and Noise Survey data



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ACE REF. : 7060556/02

## AMBIENT AIR (AA) QUALITY MONITORING AND TEST REPORT

COMPANY NAME: Hifab International AB, Sweden (Hifab)  
PROJECT NAME : Ambient Air Quality Monitoring and Noise Level Measurement Services for SRTPPF – Package 2 Project  
CLIENT LETTER REF: SRTPP2/REIM-11/70  
ADDRESS: House 14, Road 32, Gulshan 1, Dhaka 1212, Bangladesh  
HEADER/SAMPLE ID: 197935  
SAMPLING & TESTING DATE & TIME: 02/08/2013 at 8:30 AM  
ANALYSIS AND REPORTING DATE: 25/8/2013

## Ambient Air Quality Test Results

| Sampling ID and Location                                      | Sampling Site Description   | Description of Parameters               | Unit              | Concentration of Ambient Air Quality Parameters |         |         | DoE Standards |
|---|---|---|-------------------|---|---------|---------|---------------|
|   |   |   |                   | Minimum   | Maximum | Average |               |
| AAQ_03<br>(Tamabil Land Port)<br>25°10'52.8"N<br>92°02'05.7"E | <ul style="list-style-type: none"> <li>Sampling conducted at the intersection of Sylhet-Tamabil and Tamabil Custom House road.</li> <li>Evidence of precipitation in last 24 hours.</li> <li>Hilly area and vegetation was high.</li> </ul> | Carbon Monoxide (CO)                    | µg/m <sup>3</sup> | 0   | 282     | 151.46  | 40,000        |
|   |   | Nitric Oxide (NO)                       | µg/m <sup>3</sup> | 0   | 900     | 125.35  | NSE*          |
|   |   | Nitrogen Dioxide (NO <sub>2</sub> )     | µg/m <sup>3</sup> | 0   | 171     | 46.83   | 100           |
|   |   | Sulphur Dioxide (SO <sub>2</sub> )      | µg/m <sup>3</sup> | 0   | 267     | 66.88   | 365           |
|   |   | Particulate Matter (PM <sub>10</sub> )  | µg/m <sup>3</sup> | 0   | 7       | 1.35    | 150           |
|   |   | Particulate Matter (PM <sub>2.5</sub> ) | µg/m <sup>3</sup> | 1   | 20      | 7.74    | 65            |
|   |   | Air Temperature                         | °C                | 23  | 29      | 25.67   |               |
|   |   | Relative Humidity                       | %                 | 67  | 81      | 73.72   |               |
|   |   | Wind Speed                              | kph               | 1.1   | 7.3     | 3.95    |               |
|   |   | Wind Direction                          | Degree            | 4   | 347     | 171     |               |

## Noise Measurement Test Results

| Sampling ID and Location                                | Sampling Site Description | Unit | Noise Level |         |                 | DoE Standards |
|---|---------------------------|------|-------------|---------|-----------------|---------------|
|   |                           |      | Minimum     | Maximum | L <sub>eq</sub> |               |
| NM_03 (Tamabil Land Port)<br>25°10'52.8"N, 92°02'05.7"E | See Above                 | dB   | 46.4        | 73.6    | 61              | 60            |

\* No Standards Established (NSE) yet

Remarks\*: Highest value from the amended Schedule-2, 2005, of ( Air Quality Standard) Environmental Conservation Rules, 1997 has been considered.

Remarks\*\*: Mixed Zone daytime standard of Schedule-4 of (Noise Measurement Standard) Environmental Conservation Rules, 1997 have been considered.

Report Reviewed and Approved by:  
**Mehedi Hasan, M.Sc. (Env Engineering)**  
Manager, Safeguard Services Group  
ACE Consultants Ltd, Dhaka-1206

Report Prepared by:  
**Md. Shafiqur Rahman, M.Sc. (Env Science)**  
Environmental Specialist  
ACE Consultants Ltd, Dhaka-1206

**Appendix 5: Rapid Environmental Assessment (REA) Checklist**

|   |   |
|---|---|
| ➤ This checklist is to be prepared to support the environmental classification of a project. It is to be attached to the environmental categorization form that is to be prepared and submitted to the RHD / CSC  |   |
| ➤ This checklist is to be completed with the assistance of an Environment Specialist in a Regional Department.  |   |
| ➤ This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to AIBB checklists and handbooks on (i) involuntary resettlement, (ii) poverty reduction, (iii) participation, and (iv) gender and development. |   |
| ➤ Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. use the "remarks" section to discuss any anticipated mitigation measures.  |   |
| <b>Name of District: Sylhet</b>   |   |
| <b>Project Title</b>  | <b>: Sylhet-Tamabil Road Up-gradation Project</b>   |
| <b>Sector Division</b>  | <b>: Sylhet-Tamabil (N2) Road<br/>Roads and Highways Department, Ministry of Road Transport and Bridges</b> |

**Field Survey on Environmental Questionnaire**

| Screening Questions  | Yes | No | Remarks  |
|--|-----|----|--|
| A. Projects ting<br>Is the project area adjacent to or within any of the following environmentally sensitive areas?  |     |    |  |
| CULTURAL HERITAGE SITE   | √   |    | Alongside the road some cultural heritage sites are located, such as mosque, religious institutes, graveyard, etc. Dislocation of these sites can be done through conducting Public/ community consultations and mutual understanding. |
| PROTECTED AREA   |     | √  |  |
| WETLAND  |     | √  |  |
| MANGROVE   |     | √  |  |
| ESTUARINE  |     | √  |  |
| BUFFER ZONE OF PROTECTED AREA  |     | √  |  |
| SPECIAL AREA FOR PROTECTING BIODIVERSITY   |     | √  |  |
| POTENTIAL ENVIRONMENTAL IMPACTS<br>Will the Project cause...   |     |    |  |
| Encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?  | √   |    | A few physical structures may be partially encroached / affected by widening of existing road. Disfiguration of landscape by road embankments, cuts, fills, and quarries may occur.  |
| Encroachment on precious ecology (e.g. sensitive or protected areas)?  |     | √  |  |
| Alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site? |     | √  |  |
| Deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?                                | √   |    | Deterioration may occur at construction camps and work site, if proper mitigation measures (under the ESMP) are not followed by contractors during construction stage of project.  |

| Screening Questions   | Yes | No | Remarks   |
|---|-----|----|---|
| Increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?   | √   |    | May occur during construction stage of project if proper mitigation measures (under the ESMP) are implemented by the contractors during construction stage of project.  |
| Risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation during project      | √   |    | To avoid risks and vulnerability appropriate mitigation measures related to occupational and community health and safety need to be included in the ESMP and implementation.  |
| Noise and vibration due to blasting and other civil works?  | √   |    | Noise attenuation and vibration preventive measures should be implemented by the Contractors during the civil works.  |
| Dislocation or involuntary resettlement of people?  | √   |    | Proper implementation of Resettlement Action Plan is required.  |
| Dislocation and compulsory resettlement of people living in right-of-way?   | √   |    | Proper implementation of Resettlement Action Plan is required.  |
| Disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?  | √   |    | Resettlement Action Plan should properly address impacts on the poor, women and children, Indigenous Peoples or other   |
| Other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?                                       | √   |    | Not significant   |
| Hazardous driving conditions where construction interferes with pre-existing roads?   | √   |    | Proper traffic management is needed during civil works.   |
| Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases (such as STI's and HIV/AIDS) from workers to local populations? | √   |    | Proper accommodation of labors, sanitation, safe drinking water and drainage facilities, and curative and preventive measures on health safety of the workers with awareness camping on transmission of communicable diseases should be considered in the labor camps and work sites. |
| Creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents?   | √   |    | If filling materials will collect from the borrow pits alongside the project road, which needs proper design for digging and maintenance during operation stage of project.   |
| Accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials?  | √   |    | Implementation of Road safety design and good traffic management is needed to avoid accident risks and spill of toxic chemicals during operation stage of project   |
| Increased noise and air pollution resulting from traffic volume?  | √   |    | Insignificant. Good design of road pavement may reduce the noise and air pollution resulting from increased traffic volume during operation stage.  |
| Increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?   | √   |    | Insignificant.  |
| Social conflicts if workers from other regions or countries are hired?  | √   |    | Local people, especially project affected persons should be given priority to involve in the construction works at site.  |

| Screening Questions  | Yes | No | Remarks  |
|--|-----|----|--|
| Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?  | √   |    | Insignificant. Mitigation measures under ESMP should be implemented properly   |
| Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?   | √   |    | Insignificant. Mitigation measures under ESMP should be implemented properly   |
| Community safety risks due to both accidental and natural causes, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning.                                 |     | √  |  |
| <b>Climate Change and Disaster Risk Questions</b><br><b>The following questions are not for environmental categorization. They are included in this checklist to help identify potential climate and disaster risks.</b>   |     |    |  |
| <ul style="list-style-type: none"> <li>• Is the Project area subject to hazards such as earthquakes, floods, landslides, tropical cyclone winds, storm surges, tsunami or volcanic eruptions and climate changes (see Appendix)</li> </ul>   | √   |    | <ul style="list-style-type: none"> <li>▪ Project area may subject to hazards such as earthquakes, floods and tropical cyclone winds. Climate change aspect should be considered in Road design, Pavement design of the project.</li> </ul> |
| <ul style="list-style-type: none"> <li>▪ Could changes in temperature, precipitation, or extreme events patterns over the Project lifespan affect technical or financial sustainability (e.g., increased erosion or landslides could increase maintenance costs, permafrost melting or increased soil moisture content could affect sub-grade).</li> </ul> | √   |    | <ul style="list-style-type: none"> <li>▪ Insignificant</li> </ul>  |
| <ul style="list-style-type: none"> <li>▪ Are there any demographic or socio-economic aspects of the Project area that are already vulnerable (e.g., high incidence of marginalized populations, rural-urban migrants, illegal settlements, ethnic minorities, women or children)?</li> </ul>   |     | √  |  |
| <ul style="list-style-type: none"> <li>▪ Could the Project potentially increase the climate or disaster vulnerability of the surrounding area (e.g., by encouraging settlement in areas that will be more affected by floods in the future, or encouraging settlement in earthquake zones)?</li> </ul>   |     | √  |  |

**Note: Hazards are potentially damaging physical events.**

**Conclusion:** Implementation of Project at construction stage will have some adverse impacts on natural and social environmental of the project area, so a detailed Environmental Impact Assessment including Environmental and Social Management Plan is necessary to be carried out at Detailed Engineering Design stage.

## Environments, Hazards and Climate Changes

| Environment   | Natural Hazards and Climate Change  | Example Impact on Roads and Highways   |
|---|---|--|
| <b>Arid/Semi-arid and desert environment</b>                                | <p>Low erratic rainfall of up to 500 mm rainfall per annum with periodic droughts and high rainfall variability. Low vegetative cover. Resilient ecosystems &amp; complex pastoral and systems, but medium certainty that 10–20% of dry lands degraded; 10-30% projected decrease in water availability in next 40 years; projected increase in drought duration and severity under climate change. Increased mobilization of sand dunes and other soils as vegetation cover declines; likely overall decrease in agricultural productivity, with rain-fed agriculture yield reduced by 30% or more by 2020. Earthquakes and other geophysical hazards may also occur in these environments.</p>            | <p>Not relevant to this project</p>  |
| <b>Humid and sub-humid plains, foothills and hill country</b>               | <p>More than 500 mm precipitation/yr. Resilient ecosystems &amp; complex human pastoral and cropping systems. 10-30% projected decrease in water availability in next 40 years; projected increase in droughts, heat waves and floods; increased erosion of loess-mantled landscapes by wind and water; increased gully erosion; landslides likely on steeper slopes. Likely overall decrease in agricultural productivity &amp; compromised food production from variability, with rain-fed agriculture yield reduced by 30% or more by 2020. Increased incidence of forest and agriculture-based insect infestations. Earthquakes and other geophysical hazards may also occur in these environments.</p> | <p>Increased landslides and mudflows disrupt road networks, Increased moisture content in the subsurface can result in increased penetration of water into the fill, which may also collapse, Reduced effectiveness of drainage which results in a reduction in the bearing capacity of the soils which become saturated</p> |
| <b>River valleys/deltas and estuaries and other low-lying coastal areas</b> | <p>River basins, deltas and estuaries in low-lying areas are vulnerable to river in floods, storm surges associated with tropical cyclones/typhoons and sea level rise; natural (and human-induced) subsidence resulting from sediment compaction and ground water extraction; liquefaction of soft sediments as result of earthquake ground shaking. Tsunami possible/likely on some coasts. Lowland agri-business and subsistence farming in these regions at significant risk.</p>   | <p>Same as above</p>   |

|                              |  |  |
|------------------------------|--|--|
| <b>Small islands</b>         | Small islands generally have land areas of less than 10,000km <sup>2</sup> in area, though Papua New Guinea and Timor with much larger land areas are commonly included in lists of small islands developing states. Low-lying islands are especially vulnerable to storm surge, tsunami and sea-level rise and, frequently, coastal erosion, with coral reefs threatened by ocean warming in some areas. Sea level rise is likely to threaten the limited ground water resources. High islands often experience high rainfall intensities, frequent landslides and tectonic environments in which landslides and earthquakes are not uncommon with (occasional) volcanic eruptions. Small islands may have low adaptive capacity and high adaptation costs relative to GDP. | Not relevant to this project.  |
| <b>Mountain ecosystems</b>   | Accelerated glacial melting, rockfalls/landslides and glacial lake outburst floods, leading to increased debris flows, river bank erosion and floods and more extensive outwash plains and, possibly, more frequent wind erosion in intermountain valleys. Enhanced snow melt and fluctuating stream flows may produce seasonal floods and droughts. Melting of permafrost in some environments. Faunal and floral species migration. Earthquakes, landslides and other geophysical hazards may also occur in these environments.  | Not relevant to this project   |
| <b>Volcanic environments</b> | Recently active volcanoes (erupted in last 10,000 years – see <a href="http://www.volcano.si.edu">www.volcano.si.edu</a> ). Often fertile soils with intensive agriculture and landslides on steep slopes. Subject to earthquakes and volcanic eruptions including pyroclastic flows and mudflows/lahars and/or gas emissions and occasionally widespread ashfall.   | Damage and loss of roads, insecurity for road works crew and maintenance |

## Appendix 6: DOE's Approval of TOR for EIA

Government of the People's Republic of Bangladesh  
 Department of Environment  
 www.doe-bd.org  
 Head Office, Paribesh Bhaban  
 E-16 Agargaon, Dhaka-1207

Memo No: DoE/Clearance/5259/2014/12

Date: 09/01/2014

Subject: Approval of Terms of Reference for Environmental Impact Assessment (EIA) in favour of Three Highways under Sub-Regional Road Transport Project (Road Component Package-2).

Ref: Your application received on 17 November 2013.

With reference to your letter dated 17.11.2013 for the subject mentioned above, the Department of Environment hereby gives approval of TOR for Environmental Impact Assessment (EIA) in favour of Three Highways (i. Dhaka-Sylhet-Tamabil Road, ii. Chittagong-Cox's Bazar-Teknaf Road, iii. Comilla-Brahmanbaria and Darkhar-Akhaura Road) under Sub-Regional Road Transport Project (Road Component Package-2) subject to fulfilling the following terms and conditions.

1. Roads and Highways Department (RHD) shall conduct a comprehensive Environmental Impact Assessment (EIA) study considering the overall activity of the said three Project in accordance with the TOR submitted to the DOE and additional suggestions provided herein.
2. The EIA report should be prepared in accordance with following indicative outlines:
  1. Executive summary
  2. Introduction: (Background, brief description, scope of study, methodology, limitation, EIA team, references)
  3. Legislative, regulation and policy consideration (covering the potential legal, administrative, planning and policy framework within which the EIA will be prepared)
  - 4a. Project activities: A list of the main project activities to be undertaken during site clearing, construction as well as operation.
  - 4b. Project schedule: The phase and timing for development of the project
  - 4c. Resources and utilities demand: Resources required to develop the project, such as soil and construction material and demand for utilities (water, electricity, sewerage, waste disposal and others), as well as infrastructure (road, drains, and others) to support the project.
  - 4d. Map and survey information  
Location map, Cadastral map showing land plots (project and adjacent area), Geological map showing geological units, fault zone, and other natural features.
5. Baseline Environmental Condition should include, inter alia, following:
  - Physical Environment : Geology, Topology, Geomorphology, Soils, Meteorology, and Hydrology.
  - Biological Environment : Habitats, Aquatic life and fisheries, Terrestrial Habitats and Flora and Fauna
  - Environment Quality : Air, Water, Soil and Sediment Quality.
6. Socio-economic environment should include, inter alia, following:
  - Population: Demographic profile and ethnic composition
  - Settlement and housing
  - Traffic and transport
  - Public utilities: water supply, sanitation and solid waste
  - Economy and employment: employment structure and cultural issues in employment
  - Fisheries: fishing activities, fishing communities, commercial important species, fishing resources, commercial factors.

1/2

7. Identification, Prediction and Evaluation of Potential Impacts (identification, prediction and assessment of positive and negative impacts likely to result from the proposed project).

In identification and analysis of potential impacts'-the 'Analysis' part shall include the analysis of relevant spatial and non-spatial data. The outcome of the analysis shall be presented with the scenarios, maps, graphics etc. for the cases of anticipated impacts on baseline. Description of the impacts of the project on air, water, land, hydrology, vegetation-man made or natural, wildlife, socio-economic aspect shall be incorporated in detail.

8. Management Plan/Procedures:

For each significant major impact, proposed mitigation measures will be set out for incorporation into project design or procedures, impacts, which are not capable of mitigation, will be identified as residual impacts Both technical and financial plans shall be incorporated for proposed mitigation measures..

An outline of the Environmental Management Plan shall be developed for the project.

In Environmental Monitoring Plan, a detail technical and financial proposal shall be included for developing an in-house environmental monitoring system to be operated by the proponent's own resources (equipments and expertise).

9. Consultation with Stakeholders/Public Consultation (ensures that consultation with interested parties and the general public will take place and their views taken into account in the planning and execution of the project)

Beneficial Impacts (summarize the benefits of the project to the Bangladesh nation, people and local community and the enhancement potentials)

10. Conclusion and Recommendations

3. Without approval of EIA report by the Department of Environment, Roads and Highways Department (RHD) shall not be able to open L/C in favor of importable machineries.
4. Without obtaining Environmental Clearance, Roads and Highways Department (RHD) shall not start operation of of the projects.
5. Roads and Highways Department (RHD) shall submit the EIA along with a filled-in application for Environmental Clearance in prescribed form, the applicable fee in a treasury chalan, the no objection certificates (NOCs) from the local authority, NOC from forest department (if it is required in case of cutting any forested plant/trees-private or public), NOC in favor of Cutting/Dressing (if it is required) of Hill/Hillock from the concerned authority and NOC from other relevant agencies for operational activity etc. for each project to the Head office of DOE in Dhaka with a copy to concerned Divisional office of DOE in Dhaka, Chittagong and Sylhet.

  
09.07.2014

(Syed Nazmul Ahsan)  
Deputy Director (Environmental Clearance)  
and  
Member Secretary  
Environmental Clearance Committee  
Phone # 8181778

**Mr. Dilip Kumar Guha**

Project Director & Additional Chief Engineer  
Roads & Highways Department (RHD)  
Technical Assistance for Subregional Road Transportation Project Preparatory Facility  
132/4, New Baily Road, Dhaka.

**Copy Forwarded to :**

- 1) PS to Secretary, Ministry of Environment and Forest, Bangladesh Secretariat, Dhaka.
- 2) Director, Department of Environment, Dhaka Region, Chittagong/Sylhet Division, Dhaka, Chittagong, Sylhet.
- 3) Assistant Director, Office of the Director General, Department of Environment, Head Office, Dhaka.

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Appendix 7: Attendance List of Public Consultation

| Sylhet-Tamabil Road Upgradation Project |                           |                  |   |                  |                    |           |
|---|---------------------------|------------------|---|------------------|--------------------|-----------|
| Consultation Meeting                    |                           |                  |   |                  |                    |           |
| Time: 10.00 Am                          |                           | Ward: 03         |   | Date: 04.03.2019 |                    |           |
| Venue: Boteskhora                       |                           | Thana: Shahporan |   | District: sylhet |                    |           |
| Sl. No.                                 | Name of the Participant's | Gender           |   | Occupation       | Contact No.        | Signature |
|   |                           | M                | F |                  |                    |           |
| ১                                       | Md. Bashiruddin           | ✓                |   | vice chair       | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ২                                       | MD NIZAM UDDIN            | ✓                |   | U.P. Member      | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ৩                                       | MD JUNA B ALI             | ✓                |   | Shopote          | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ৪                                       | Acce                      | ✓                |   | Shopote          | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ৫                                       | Nasrin Akter Jahan        |                  | ✓ | service KMC      | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ৬                                       | Md. Anisur Rahman         | ✓                |   | Service KMC      | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ৭                                       | TAHID                     | ✓                |   | SON              | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ৮                                       | SON SON                   | ✓                |   | "                | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ৯                                       | MD. JUMAYEL ISLAM CHY     | ✓                |   | "                | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ১০                                      | MD ABDUL MARTIN           |                  |   | farmer           | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ১১                                      | MD: MIHAZ                 | ✓                |   | SON              | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ১২                                      | Shaham Humain             | ✓                |   | SON              | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ১৩                                      | Shukol Anwar              | ✓                |   | SON              | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ১৪                                      | MD. Saleh                 | ✓                |   | "                | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ১৫                                      | SON SON                   | ✓                |   | "                | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ১৬                                      | SON SON                   | ✓                |   | SON              | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ১৭                                      | SON SON                   | ✓                |   | "                | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ১৮                                      | SON SON                   | ✓                |   | "                | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ১৯                                      | SON SON                   | ✓                |   | "                | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ২০                                      | SON SON                   | ✓                |   | "                | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ২১                                      | SON SON                   | ✓                |   | "                | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ২২                                      | SON SON                   | ✓                |   | "                | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ২৩                                      | SON SON                   | ✓                |   | "                | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ২৪                                      | SON SON                   | ✓                |   | "                | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ২৫                                      | SON SON                   | ✓                |   | "                | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ২৬                                      | SON SON                   | ✓                |   | "                | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ২৭                                      | SON SON                   | ✓                |   | "                | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ২৮                                      | SON SON                   | ✓                |   | "                | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ২৯                                      | SON SON                   | ✓                |   | "                | XXXXXXXXXXXXXXXXXX | u Bashir  |
| ৩০                                      | SON SON                   | ✓                |   | "                | XXXXXXXXXXXXXXXXXX | u Bashir  |



## Sylhet-Tamabil Road Upgradation Project Consultation Meeting

Time: 10.00 AM

Ward: 09

Date: 04.08.2019

Venue: Botte store

Thana: Shaha potok

District: Sylhet

| Sl. No. | Name of the Participant's | Gender |   | Occupation | Contact No.          | Signature |
|---------|---------------------------|--------|---|------------|----------------------|-----------|
|         |                           | M      | F |            |                      |           |
| ১১০     | শ্রী. মোহাম্মদ আলী        | ✓      |   | স্বাধীন    | XXXXXXXXXXXXXXXXXXXX |           |
| ১১১     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১১২     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১১৩     | Shahed Ahmed              | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১১৪     | MD: Lufula Rahman         | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১১৫     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১১৬     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১১৭     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১১৮     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১১৯     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১২০     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১২১     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১২২     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১২৩     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১২৪     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১২৫     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১২৬     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১২৭     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১২৮     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১২৯     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১৩০     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১৩১     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১৩২     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১৩৩     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১৩৪     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১৩৫     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১৩৬     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১৩৭     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১৩৮     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১৩৯     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১৪০     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১৪১     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১৪২     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১৪৩     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১৪৪     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১৪৫     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১৪৬     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১৪৭     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১৪৮     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১৪৯     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| ১৫০     | শ্রী. মোহাম্মদ আলী        | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |

## Sylhet-Tamabil Road Upgradation Project Consultation Meeting

Time: 10.00AM

Ward: ০৯

Date: ০৭.০৮.২০১৭

Venue: Bottle Stone

Thana: Shakh potain

District: sylhet

| Sl. No. | Name of the Participant's | Gender |   | Occupation | Contact No.          | Signature |
|---------|---------------------------|--------|---|------------|----------------------|-----------|
|         |                           | M      | F |            |                      |           |
| ৬৪      | বাবুজি                    | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | বাবুজি    |
| ৬৫      | মাসুম হোসেন               | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | মাসুম     |
| ৬৬      | মোঃ মাসুম হোসেন           | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | মাসুম     |
| ৬৭      | মোঃ মাসুম হোসেন           | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | মাসুম     |
| ৬৮      | মোঃ মাসুম হোসেন           | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | মাসুম     |
| ৬৯      | মোঃ মাসুম হোসেন           | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | মাসুম     |
| ৭০      | মোঃ মাসুম হোসেন           | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | মাসুম     |
| ৭১      | মোঃ মাসুম হোসেন           | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | মাসুম     |
| ৭২      | মোঃ মাসুম হোসেন           | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | মাসুম     |
| ৭৩      | মোঃ মাসুম হোসেন           | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | মাসুম     |
| ৭৪      | মোঃ মাসুম হোসেন           | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | মাসুম     |
| ৭৫      | মোঃ মাসুম হোসেন           | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | মাসুম     |
| ৭৬      | মোঃ মাসুম হোসেন           | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | মাসুম     |
| ৭৭      | মোঃ মাসুম হোসেন           | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | মাসুম     |
| ৭৮      | মোঃ মাসুম হোসেন           | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | মাসুম     |
| ৭৯      | মোঃ মাসুম হোসেন           | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | মাসুম     |
| ৮০      | মোঃ মাসুম হোসেন           | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | মাসুম     |







## Sylhet-Tamabil Road Upgradation Project Consultation Meeting

Time: 4.00 pm

Ward: 08

Date: 04.08.2019

Venue: পিতা বাজা

Thana: Shah poran

District: Sylhet

| Sl. No. | Name of the Participant's | Gender |   | Occupation | Contact No.                                  | Signature |
|---------|---------------------------|--------|---|------------|--|-----------|
|         |                           | M      | F |            |  |           |
| ১০      | সমন্বিত                   | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX<br>XXXXXXXXXXXXXXXXXXXX | সমন্বিত   |
| ১১      | সমন্বিত                   | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX<br>XXXXXXXXXXXXXXXXXXXX | সমন্বিত   |
| ১২      | সমন্বিত                   | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX<br>XXXXXXXXXXXXXXXXXXXX | সমন্বিত   |
| ১৩      | সমন্বিত                   | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX<br>XXXXXXXXXXXXXXXXXXXX | সমন্বিত   |
| ১৪      | সমন্বিত                   | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX<br>XXXXXXXXXXXXXXXXXXXX | সমন্বিত   |
| ১৫      | সমন্বিত                   | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX<br>XXXXXXXXXXXXXXXXXXXX | সমন্বিত   |
| ১৬      | সমন্বিত                   | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX<br>XXXXXXXXXXXXXXXXXXXX | সমন্বিত   |
| ১৭      | সমন্বিত                   | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX<br>XXXXXXXXXXXXXXXXXXXX | সমন্বিত   |
| ১৮      | সমন্বিত                   | ✓      |   | সিআইডি     | XXXXXXXXXXXXXXXXXXXX<br>XXXXXXXXXXXXXXXXXXXX | সমন্বিত   |
| ১৯      | সমন্বিত                   | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX<br>XXXXXXXXXXXXXXXXXXXX | সমন্বিত   |
| ২০০     | সমন্বিত                   | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX<br>XXXXXXXXXXXXXXXXXXXX | সমন্বিত   |
| ২০১     | সমন্বিত                   | ✓      |   | কৃষক (KMC) | XXXXXXXXXXXXXXXXXXXX<br>XXXXXXXXXXXXXXXXXXXX | সমন্বিত   |
| ২০২     | সমন্বিত                   | ✓      |   | কৃষক (KMC) | XXXXXXXXXXXXXXXXXXXX<br>XXXXXXXXXXXXXXXXXXXX | সমন্বিত   |

## Sylhet-Tamabil Road Upgradation Project Consultation Meeting

Time: 10.00AM  
Venue: Dashpara

Ward: 06  
Thana: Bhalpara

Date: 05.08.2019  
District: Sylhet

| Sl. No. | Name of the Participant's | Gender |   | Occupation  | Contact No.          | Signature   |
|---------|---------------------------|--------|---|-------------|----------------------|-------------|
|         |                           | M      | F |             |                      |             |
| 1       | Atanur Rahman             |        | ✓ | Service RMC | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 2       | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 3       | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 4       | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 5       | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 6       | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 7       | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 8       | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 9       | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 10      | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 11      | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 12      | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 13      | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 14      | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 15      | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 16      | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 17      | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 18      | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 19      | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 20      | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 21      | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 22      | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 23      | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 24      | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 25      | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 26      | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 27      | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 28      | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 29      | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 30      | Atanur Rahman             | ✓      |   | Service     | XXXXXXXXXXXXXXXXXXXX | [Signature] |

## Sylhet-Tamabil Road Upgradation Project Consultation Meeting

Time: 10.00 AM

Ward: 06

Date: 05.08.2019

Venue: Dash para

Thana: Shah poran

District: Sylhet

| Sl. No. | Name of the Participant's | Gender |   | Occupation | Contact No.          | Signature |
|---------|---------------------------|--------|---|------------|----------------------|-----------|
|         |                           | M      | F |            |                      |           |
| 31      | শ্রী: সুরজ কান্ত          | ✓      |   | প্রশাসক    | XXXXXXXXXXXXXXXXXXXX |           |
| 32      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 33      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 34      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 35      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 36      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 37      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 38      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 39      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 40      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 41      | MD. ABDEL HAMMAN          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 42      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 43      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 44      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 45      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 46      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 47      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 48      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 49      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 50      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 51      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 52      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 53      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 54      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 55      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 56      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 57      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 58      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 59      | শ্রী: সুরজ কান্ত          | ✓      |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |
| 60      | MD. Ahsan ullo            |        |   | কাজী       | XXXXXXXXXXXXXXXXXXXX |           |

## Sylhet-Tamabil Road Upgradation Project Consultation Meeting

Time: 10.00Am

Ward: 06

Date: 05.08.2019

Venue: Dash pora

Thana: Shah poran

District: sylhet

| Sl. No. | Name of the Participant's | Gender |   | Occupation | Contact No.          | Signature |
|---------|---------------------------|--------|---|------------|----------------------|-----------|
|         |                           | M      | F |            |                      |           |
| 61      | শ্রী: দেলিয়ার হোসেন দিলু | ✓      |   | ব্যবসা     | XXXXXXXXXXXXXXXXXXXX |           |
| 62      | শ্রী: কামরুল হোসেন        | ✓      |   | ব্যবসা     | XXXXXXXXXXXXXXXXXXXX |           |
| 63      | শ্রী: মোস্তাফিজ আলী       | ✓      |   | ব্যবসা     | XXXXXXXXXXXXXXXXXXXX |           |
| 64      | শ্রী: মোস্তাফিজ আলী       | ✓      |   | ব্যবসা     | XXXXXXXXXXXXXXXXXXXX |           |
| 65      | শ্রী: মোস্তাফিজ আলী       | ✓      |   | ব্যবসা     | XXXXXXXXXXXXXXXXXXXX |           |
| 66      | শ্রী: মোস্তাফিজ আলী       | ✓      |   | ব্যবসা     | XXXXXXXXXXXXXXXXXXXX |           |
| 67      | শ্রী: মোস্তাফিজ আলী       | ✓      |   | ব্যবসা     | XXXXXXXXXXXXXXXXXXXX |           |
| 68      | শ্রী: মোস্তাফিজ আলী       | ✓      |   | ব্যবসা     | XXXXXXXXXXXXXXXXXXXX |           |
| 69      | শ্রী: মোস্তাফিজ আলী       | ✓      |   | ব্যবসা     | XXXXXXXXXXXXXXXXXXXX |           |
| 70      | শ্রী: মোস্তাফিজ আলী       | ✓      |   | ব্যবসা     | XXXXXXXXXXXXXXXXXXXX |           |
| 71      | শ্রী: মোস্তাফিজ আলী       | ✓      |   | ব্যবসা     | XXXXXXXXXXXXXXXXXXXX |           |
| 72      | শ্রী: মোস্তাফিজ আলী       | ✓      |   | ব্যবসা     | XXXXXXXXXXXXXXXXXXXX |           |
| 73      | শ্রী: মোস্তাফিজ আলী       | ✓      |   | ব্যবসা     | XXXXXXXXXXXXXXXXXXXX |           |
| 74      | শ্রী: মোস্তাফিজ আলী       | ✓      |   | ব্যবসা     | XXXXXXXXXXXXXXXXXXXX |           |
| 75      | শ্রী: মোস্তাফিজ আলী       | ✓      |   | ব্যবসা     | XXXXXXXXXXXXXXXXXXXX |           |
| 76      | শ্রী: মোস্তাফিজ আলী       | ✓      |   | ব্যবসা     | XXXXXXXXXXXXXXXXXXXX |           |

## Sylhet-Tamabil Road Upgradation Project Consultation Meeting

Time: 03.30pm

Ward:

Date: 05.08.19

Venue: Desbast up Parishad.

Thana: Jointapur

District: Sylhet

| Sl. No. | Name of the Participant's | Gender |   | Occupation | Contact No.          | Signature |
|---------|---------------------------|--------|---|------------|----------------------|-----------|
|         |                           | M      | F |            |                      |           |
| 1.      | Md. Mainul Islam          | ✓      |   | UP Member  | XXXXXXXXXXXXXXXXXXXX |           |
| 2.      | Md. Abdur Rokib           | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| 3.      | Hazi Jamal Uddin          | ✓      |   | Business   | XXXXXXXXXXXXXXXXXXXX |           |
| 4.      | Md. Igub Ali              | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| 5.      | Md. Abu Hanif             | ✓      |   | Teacher    | XXXXXXXXXXXXXXXXXXXX |           |
| 6.      | Md. Nazim Uddin           | ✓      |   | Business   | XXXXXXXXXXXXXXXXXXXX |           |
| 7.      | Arifuddin                 | ✓      |   | Service    | XXXXXXXXXXXXXXXXXXXX |           |
| 8.      | Tazuddin                  | ✓      |   | Business   | XXXXXXXXXXXXXXXXXXXX |           |
| 9.      | Abdul Nur                 | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| 10.     | Bodsul Islam              | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| 11.     | Salim Ahmmmed             | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| 12.     | Antaz ullah               | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| 13.     | Ajmat ullah               | ✓      |   | Drivers    | XXXXXXXXXXXXXXXXXXXX |           |
| 14.     | Lutfon Rahman             | ✓      |   | Business   | XXXXXXXXXXXXXXXXXXXX |           |
| 15.     | Md. Bostin Uddin          | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| 16.     | Ahad                      | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| 17.     | Abdul Musyabbir           | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| 18.     | Foysal Ahmmmed            | ✓      |   | Restaurant | XXXXXXXXXXXXXXXXXXXX |           |
| 19.     | Abdul satter              | ✓      |   | Business   | XXXXXXXXXXXXXXXXXXXX |           |
| 20.     | Salim Peza                | ✓      |   | Service    | XXXXXXXXXXXXXXXXXXXX |           |
| 21.     | Md Zakaria                | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| 22.     | Abdur Shaed               | ✓      |   | Business   | XXXXXXXXXXXXXXXXXXXX |           |
| 23.     | Md Shorulkha              | ✓      |   | Business   | XXXXXXXXXXXXXXXXXXXX |           |
| 24.     | Hasna begum               | ✓      |   | Service    | XXXXXXXXXXXXXXXXXXXX |           |
| 25.     | Md Abdulkha               | ✓      |   | Business   | XXXXXXXXXXXXXXXXXXXX |           |
| 26.     | Md Shaed                  | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| 27.     | Md. Easasen all           | ✓      |   | u          | XXXXXXXXXXXXXXXXXXXX |           |
| 28.     | Sajib chandra das         | ✓      |   | pharmacy   | XXXXXXXXXXXXXXXXXXXX |           |

### Sylhet-Tamabil Road Upgradation Project Consultation Meeting

Time: 03,30 Pm

Ward:

Date: 05,08,19

Venue: Dombost up Parishad, Thana: Jointapur

District: sylhet

| Sl. No. | Name of the Participant's | Gender |   | Occupation | Contact No.          | Signature   |
|---------|---------------------------|--------|---|------------|----------------------|-------------|
|         |                           | M      | F |            |                      |             |
| 29.     | (মা: নাহিদা আমূলুহ)       | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 30.     | সায়মুল হোসাইন            | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 31.     | জনাব আলী                  | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 32.     | আবদুল হামিদ               | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | ✓           |
| 33.     | (মা: নাহিদা)              | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 34.     | ভা: মাহমুদ                | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | ভা: মাহমুদ  |
| 35.     | মু সায়মুল আমূলুহ         | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | মু সায়মুল  |
| 36.     | সায়মুল হোসাইন            | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | ✓           |
| 37.     | নবাব                      | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 38.     | সায়মুল হোসাইন            | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 39.     | মু সায়মুল আমূলুহ         | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 40.     | (মা: নাহিদা)              | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 41.     | ভা: মাহমুদ                | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 42.     | (মা: নাহিদা কুতুব)        | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 43.     | (সুফোনাস আলী)             | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 44.     | সুফোনাস আলী               | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 45.     | (মা: জাহান্না)            | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 46.     | (মা: সায়মুল)             | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 47.     | (মা: সায়মুল আমূলুহ)      | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 48.     | মিঃ আলী হোসাইন            | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | ✓           |
| 49.     | আবদুল হামিদ               | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 50.     | (মা: জাহান্না)            | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 51.     | (মা: সায়মুল আমূলুহ)      | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 52.     | (মা: বাসমত)               | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 53.     | ভা: হুসাইন                | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 54.     | আবদুল হামিদ               | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 55.     | বাবু                      |        |   | ৬          | XXXXXXXXXXXXXXXXXXXX | ✓           |
| 56.     | নাহিদা হোসাইন             |        |   | ৬          | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 57.     | সায়মুল হোসাইন            |        |   | ৬          | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 58.     | আবদুল হামিদ               |        |   | ৬          | XXXXXXXXXXXXXXXXXXXX | [Signature] |





## Sylhet-Tamabil Road Upgradation Project Consultation Meeting

Time: 10.00 am

Ward:

Date: 06.08.19

Venue: Hosipur Bazar

Thana: Jointapur

District: Sylhet

| Sl. No. | Name of the Participant's | Gender |   | Occupation    | Contact No.          | Signature           |
|---------|---------------------------|--------|---|---------------|----------------------|---------------------|
|         |                           | M      | F |               |                      |                     |
| 17.     | শ্রী সার্বভৌম বসু         | ✓      |   | কৃষি          | XXXXXXXXXXXXXXXXXXXX | শ্রী সার্বভৌম       |
| 18.     | শ্রীমতী হারুন             | ✓      |   | কৃষক          | XXXXXXXXXXXXXXXXXXXX | শ্রীমতী হারুন       |
| 19.     | শ্রী সার্বভৌম বসু         | ✓      |   | UP সার্বভৌম   | XXXXXXXXXXXXXXXXXXXX | শ্রী সার্বভৌম       |
| 20.     | শ্রী সার্বভৌম বসু         | ✓      |   | কৃষক          | XXXXXXXXXXXXXXXXXXXX | শ্রী সার্বভৌম       |
| 21.     | শ্রীমতী হারুন             | ✓      |   | শ্রীমতী হারুন | XXXXXXXXXXXXXXXXXXXX | ✓                   |
| 22.     | শ্রীমতী আ. হারুন          | ✓      |   | কৃষি          | XXXXXXXXXXXXXXXXXXXX | শ্রীমতী আ. হারুন    |
| 23.     | শ্রীমতী হারুন             | ✓      |   | কৃষক          | XXXXXXXXXXXXXXXXXXXX | শ্রীমতী হারুন       |
| 24.     | শ্রীমতী মিয়াবত আলী       | ✓      |   | ৷             | XXXXXXXXXXXXXXXXXXXX | শ্রীমতী মিয়াবত আলী |
| 25.     | শ্রীমতী নজরুল ইসলাম       | ✓      |   | ৷             | XXXXXXXXXXXXXXXXXXXX | শ্রীমতী নজরুল ইসলাম |
| 26.     | শ্রীমতী মাহবুব আলী        | ✓      |   | ৷             | XXXXXXXXXXXXXXXXXXXX | শ্রীমতী মাহবুব আলী  |
| 27.     | শ্রীমতী হারুন             | ✓      |   | ৷             | XXXXXXXXXXXXXXXXXXXX | শ্রীমতী হারুন       |
| 28.     | শ্রীমতী হারুন             | ✓      |   | ৷             | XXXXXXXXXXXXXXXXXXXX | শ্রীমতী হারুন       |
| 29.     | শ্রীমতী হারুন             | ✓      |   | ৷             | XXXXXXXXXXXXXXXXXXXX | শ্রীমতী হারুন       |
| 30.     | শ্রীমতী হারুন             | ✓      |   | ৷             | XXXXXXXXXXXXXXXXXXXX | শ্রীমতী হারুন       |
| 31.     | শ্রীমতী হারুন             | ✓      |   | ৷             | XXXXXXXXXXXXXXXXXXXX | শ্রীমতী হারুন       |
| 32.     | শ্রীমতী হারুন             | ✓      |   | ৷             | XXXXXXXXXXXXXXXXXXXX | শ্রীমতী হারুন       |
| 33.     | শ্রীমতী হারুন             | ✓      |   | ৷             | XXXXXXXXXXXXXXXXXXXX | শ্রীমতী হারুন       |
| 34.     | শ্রীমতী হারুন             | ✓      |   | ৷             | XXXXXXXXXXXXXXXXXXXX | শ্রীমতী হারুন       |
| 35.     | শ্রীমতী হারুন             | ✓      |   | ৷             | XXXXXXXXXXXXXXXXXXXX | শ্রীমতী হারুন       |
| 36.     | শ্রীমতী হারুন             | ✓      |   | ৷             | XXXXXXXXXXXXXXXXXXXX | শ্রীমতী হারুন       |
| 37.     | শ্রীমতী হারুন             | ✓      |   | ৷             | XXXXXXXXXXXXXXXXXXXX | শ্রীমতী হারুন       |
| 38.     | শ্রীমতী হারুন             | ✓      |   | ৷             | XXXXXXXXXXXXXXXXXXXX | শ্রীমতী হারুন       |
| 39.     | শ্রীমতী হারুন             | ✓      |   | ৷             | XXXXXXXXXXXXXXXXXXXX | শ্রীমতী হারুন       |
| 40.     | শ্রীমতী হারুন             | ✓      |   | ৷             | XXXXXXXXXXXXXXXXXXXX | শ্রীমতী হারুন       |
| 41.     | শ্রীমতী হারুন             | ✓      |   | ৷             | XXXXXXXXXXXXXXXXXXXX | শ্রীমতী হারুন       |
| 42.     | শ্রীমতী হারুন             | ✓      |   | ৷             | XXXXXXXXXXXXXXXXXXXX | শ্রীমতী হারুন       |
| 43.     | শ্রীমতী হারুন             | ✓      |   | ৷             | XXXXXXXXXXXXXXXXXXXX | শ্রীমতী হারুন       |
| 44.     | শ্রীমতী হারুন             | ✓      |   | ৷             | XXXXXXXXXXXXXXXXXXXX | শ্রীমতী হারুন       |
| 45.     | শ্রীমতী হারুন             | ✓      |   | ৷             | XXXXXXXXXXXXXXXXXXXX | শ্রীমতী হারুন       |
| 46.     | শ্রীমতী হারুন             | ✓      |   | ৷             | XXXXXXXXXXXXXXXXXXXX | শ্রীমতী হারুন       |

## Sylhet-Tamabil Road Upgradation Project Consultation Meeting

Time: 10:00 am

Ward:

Date: 06.08.19

Venue:

Thana: Jointa

District: Sylhet

| Sl. No. | Name of the Participant's | Gender |   | Occupation | Contact No.          | Signature         |
|---------|---------------------------|--------|---|------------|----------------------|-------------------|
|         |                           | M      | F |            |                      |                   |
| 47.     | শ্রী বালিচ                | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | শ্রী বালিচ        |
| 48.     | শ্রী: জক                  | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX | শ্রী: জক          |
| 49.     | শ্রী: জামিল               | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX | শ্রী: জামিল       |
| 50.     | শ্রী: জামিল               | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX | ✓                 |
| 51.     | শ্রী: জামিল মিয়া         | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | ✓                 |
| 52.     | শ্রী: জামিল মিয়া         | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | EMAM              |
| 53.     | শ্রী: জামিল মিয়া         | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX | Bely              |
| 54.     | শ্রী: জামিল মিয়া         | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX | শ্রী: জামিল       |
| 55.     | শ্রী: জামিল মিয়া         | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX | শ্রী: জামিল মিয়া |
| 56.     | শ্রী: জামিল মিয়া         | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX | শ্রী: জামিল মিয়া |
| 57.     | শ্রী: জামিল মিয়া         | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX | শ্রী              |
| 58.     | শ্রী: জামিল মিয়া         | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX | শ্রী: জামিল মিয়া |
| 59.     | শ্রী: জামিল মিয়া         | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX | শ্রী: জামিল মিয়া |
| 60.     | শ্রী: জামিল মিয়া         | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX | শ্রী: জামিল মিয়া |
| 61.     | শ্রী: জামিল মিয়া         | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX | শ্রী: জামিল মিয়া |
| 62.     | শ্রী: জামিল মিয়া         | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX | শ্রী              |
| 63.     | শ্রী: জামিল মিয়া         | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX | শ্রী: জামিল মিয়া |
| 64.     | শ্রী: জামিল মিয়া         | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | শ্রী: জামিল মিয়া |
| 65.     | শ্রী: জামিল মিয়া         | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | শ্রী              |
| 66.     | শ্রী: জামিল মিয়া         | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX | শ্রী: জামিল মিয়া |
| 67.     | শ্রী: জামিল মিয়া         | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX | শ্রী: জামিল মিয়া |
| 68.     | শ্রী: জামিল মিয়া         | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | শ্রী: জামিল মিয়া |
| 69.     | শ্রী: জামিল মিয়া         | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | শ্রী: জামিল মিয়া |
| 70.     | শ্রী: জামিল মিয়া         | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX | শ্রী: জামিল মিয়া |
| 71.     | শ্রী: জামিল মিয়া         | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX | শ্রী: জামিল মিয়া |
| 72.     | শ্রী: জামিল মিয়া         | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX | শ্রী: জামিল মিয়া |
| 73.     | শ্রী: জামিল মিয়া         | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX | শ্রী: জামিল মিয়া |
| 74.     | শ্রী: জামিল মিয়া         | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | শ্রী: জামিল মিয়া |
| 75.     | শ্রী: জামিল মিয়া         | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX | শ্রী: জামিল মিয়া |
| 76.     | শ্রী: জামিল মিয়া         | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | শ্রী: জামিল মিয়া |

## Sylhet-Tamabil Road Upgradation Project Consultation Meeting

Time: 10.00 am

Ward:

Date: 06.08.19

Venue: Hasipur Bazar

Thana: Jointa

District: sylhet.

| Sl. No. | Name of the Participant's | Gender |   | Occupation | Contact No.          | Signature   |
|---------|---------------------------|--------|---|------------|----------------------|-------------|
|         |                           | M      | F |            |                      |             |
| 77.     | মা. মোহাম্মদ হোসেন        | ✓      |   | কাজ        | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 78.     | তিনিম হোসেন               | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 79.     | মা. বসিমা                 | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 80.     | ম. হোসেন হোসেন            | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 81.     | মা. মোহাম্মদ হোসেন        | ✓      |   | কাজ        | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 82.     | মামুন হোসেন               | ✓      |   | কাজ        | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 83.     | মা. মোহাম্মদ হোসেন        | ✓      |   | কাজ        | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 84.     | মা. হোসেন                 | ✓      |   | কাজ        | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 85.     | বিজয় হোসেন               | ✓      |   | কাজ        | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 86.     | মা. মোহাম্মদ হোসেন        | ✓      |   | কাজ        | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 87.     | মা. হোসেন                 | ✓      |   | "          | XXXXXXXXXXXXXXXXXXXX | [Signature] |
| 88.     | মা. মোহাম্মদ হোসেন        | ✓      |   | কাজ        | XXXXXXXXXXXXXXXXXXXX | [Signature] |

## Sylhet-Tamabil Road Upgradation Project Consultation Meeting

Time: 04.00 Pm

Ward:

Date: 06.02.19

Venue: Bangla Bazar

Thana: Jointa

District: sylhet

| Sl. No. | Name of the Participant's | Gender |   | Occupation   | Contact No.          | Signature |
|---------|---------------------------|--------|---|--------------|----------------------|-----------|
|         |                           | M      | F |              |                      |           |
| 1.      | Md. Aklaahur Rahaman      | ✓      |   | UP. chairman | XXXXXXXXXXXXXXXXXXXX |           |
| 2.      | Md. Tahia                 | ✓      |   | UP. chairman | XXXXXXXXXXXXXXXXXXXX |           |
| 3.      | Md. Bilal Mia             | ✓      |   | UP. Member   | XXXXXXXXXXXXXXXXXXXX |           |
| 4.      | Md. Abdul Khalek          | ✓      |   | worker       | XXXXXXXXXXXXXXXXXXXX |           |
| 5.      | Md. Bilal Hossain         | ✓      |   | Hotel Bus.   | XXXXXXXXXXXXXXXXXXXX |           |
| 6.      | Md. Foyez Uddin           | ✓      |   | Business     | XXXXXXXXXXXXXXXXXXXX |           |
| 7.      | Md. Beal Hossain          | ✓      |   | "            | XXXXXXXXXXXXXXXXXXXX |           |
| 8.      | Md. Nizam Uddin           | ✓      |   | "            | XXXXXXXXXXXXXXXXXXXX |           |
| 9.      | Md. Abul Hossain          | ✓      |   | "            | XXXXXXXXXXXXXXXXXXXX |           |
| 10.     | Md. Sabbam Hossain        | ✓      |   | "            | XXXXXXXXXXXXXXXXXXXX |           |
| 11.     | Md. Shahidul Islam        | ✓      |   | business     | XXXXXXXXXXXXXXXXXXXX |           |
| 12.     | Md. Zahingur Alam         | ✓      |   | "            | XXXXXXXXXXXXXXXXXXXX |           |
| 13.     | md Zakir Hossain          | ✓      |   | Business     | XXXXXXXXXXXXXXXXXXXX |           |
| 14.     | Md. Abdul Al Mammun       | ✓      |   | "            | XXXXXXXXXXXXXXXXXXXX |           |
| 15.     | Md. Helal Akar            | ✓      |   | student      | XXXXXXXXXXXXXXXXXXXX |           |
| 16.     | Md. Abdul Halim           | ✓      |   | VP. Membr    | XXXXXXXXXXXXXXXXXXXX |           |
| 17.     | Seni Md. Tal Senetra      | ✓      |   |              | XXXXXXXXXXXXXXXXXXXX |           |
| 18.     | Md. Faysiyesin            | ✓      |   | shop         | XXXXXXXXXXXXXXXXXXXX |           |
| 19.     | Md. Sapon                 | ✓      |   | "            | XXXXXXXXXXXXXXXXXXXX |           |
| 20.     | Md. Rabuel                | ✓      |   | student      | XXXXXXXXXXXXXXXXXXXX |           |
| 21.     | Md. Salman                | ✓      |   | WRITING      | XXXXXXXXXXXXXXXXXXXX |           |
| 22.     | Md. Nazrul Islam          | ✓      |   | Business     | XXXXXXXXXXXXXXXXXXXX |           |
| 23.     | Md. Zakaria               | ✓      |   | Service      | XXXXXXXXXXXXXXXXXXXX |           |
| 24.     | Md. Abu Jaudice           | ✓      |   | "            | XXXXXXXXXXXXXXXXXXXX |           |
| 25.     | Md. Salim Raza            | ✓      |   | service      | XXXXXXXXXXXXXXXXXXXX |           |
| 26.     | Md. Anisur Rahman         | ✓      |   | Service      | XXXXXXXXXXXXXXXXXXXX |           |
| 27.     | Nasrin Akter Salan        | ✓      |   | Service      | XXXXXXXXXXXXXXXXXXXX |           |

## Sylhet-Tamabil Road Upgradation Project Consultation Meeting

Time: ০৫.০০ pm

Ward:

Date: ০৬.০৪.১৭

Venue: Bangla Bazar

Thana: Jointa

District: Sylhet

| Sl. No. | Name of the Participant's | Gender |   | Occupation | Contact No.          | Signature         |
|---------|---------------------------|--------|---|------------|----------------------|-------------------|
|         |                           | M      | F |            |                      |                   |
| 28.     | শ্রী. হান্নিক             | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 29.     | শ্রী. আবুল কালাম          | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | শ্রী. আবুল কালাম  |
| 30.     | শ্রী. হান্নিক             | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 31.     | শ্রী. ফারুক মিয়া         | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | শ্রী. ফারুক মিয়া |
| 32.     | শ্রী. হান্নিক             | ✓      |   | UP. কর্মী  | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 33.     | শ্রী. হান্নিক             | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 34.     | শ্রী. হান্নিক             | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 35.     | শ্রী. হান্নিক             | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 36.     | শ্রী. হান্নিক             | ✓      |   | UP. কর্মী  | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 37.     | শ্রী. হান্নিক             | ✓      |   | কৃষক       | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 38.     | শ্রী. হান্নিক             | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 39.     | শ্রী. হান্নিক             | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 40.     | শ্রী. হান্নিক             | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 41.     | শ্রী. হান্নিক             | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 42.     | শ্রী. হান্নিক             | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 43.     | শ্রী. হান্নিক             | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 44.     | শ্রী. হান্নিক             | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 45.     | শ্রী. হান্নিক             | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 46.     | শ্রী. হান্নিক             | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 47.     | শ্রী. হান্নিক             | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 48.     | শ্রী. হান্নিক             | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 49.     | শ্রী. হান্নিক             | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 50.     | শ্রী. হান্নিক             | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 51.     | শ্রী. হান্নিক             | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 52.     | শ্রী. হান্নিক             | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 53.     | শ্রী. হান্নিক             | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 54.     | শ্রী. হান্নিক             | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 55.     | শ্রী. হান্নিক             | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 56.     | শ্রী. হান্নিক             | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |
| 57.     | শ্রী. হান্নিক             | ✓      |   | ৬          | XXXXXXXXXXXXXXXXXXXX | শ্রী. হান্নিক     |