Government of the People's Republic of Bangladesh

Ministry of Local Government, Rural Development and Cooperatives

Local Government Division

Improving Urban Governance and Infrastructure Program (IUGIP)

INITIAL ENVIRONMENTAL EXAMINATION

Sub-Project No: IUGIP/BHAN/UT+DR/01/2023

BHANGA POURASHAVA

December 2024

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CURRENCY EQUIVALENTS

(As of July 2023)
Currency Unit = BDT
BDT 1.00 = $ 0.0095
$ 1.00 = BDT 105.40 (approx.)

ABRREVIATIONS

ADB	-	Asian Development Bank
Ap	-	Affective Person
DoE	-	Department of environment
DPHE	-	Department of Public Health Engineering
EARF	-	Environmental Assessment and Review Framework
ECA	-	Environmental Conservation Act
ECC	-	Environmental Clearance Certificate
ECR	-	Environmental Conservation Rules
EIA	-	Environmental Impact Assessment
EMP	-	Environmental Management Plan
GRC	-	Grievance Redressal Cell
GRM	-	Grievance Redress Mechanism
IEE	-	Initial Environmental Examination
LCC	-	Location Clearance Certificate
LGED	-	Local Government Engineering Department
MLGRDC tives	-	Ministry of Local Government, Rural Development, Coopera-
O&M	-	Operation and Maintenance
OFID	-	OPEC Found for International Development
PMU	-	Project Management Office
PPTA	-	Project Preparatory Technical Assistance
MDSC	-	Project Readiness Services Consultant
RP	-	Resettlement Plan
SPS	-	Safeguard Policy Statement
Tor	-	Terms of Reference
UGIAP	-	Urban Governance Implementation Action Plan
MDSP	-	Poverty Reduction Strategy Paper
GoB	-	Government of Bangladesh
FD	-	Forest Department
MDSC	-	Project Readiness Services Consultants

GLOSSARY OF BANGLADESHI TERMS

Crore	-	10 million (= 100 lakh)
Ghat	-	Boat landing station
Hartal	-	Nationwide strike/demonstration called by opposition parties
Khal	-	Drainage ditch/canal
khas, khash	-	Belongs to government (e.g., land)
Katcha	-	Poor quality, poorly built

Lakh, lac	-	100,000
Madrasha	-	Islamic college
Mouza	-	Government-recognized land area
Parishad	-	Authority (Pourashava)
Pourashava	-	Municipality
Pucca	-	Good quality, well built, solid
Thana	-	Police station
Upazila	-	Sub-district

WEIGHTS AND MEASURES

Ha	-	hectare
Km	-	kilometer
M	-	meter
Mm	-	millimeter

NOTES

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

PREFACE

The premises of this Initial Environmental Examination Report (IEE) are the MDS Consultant services presentation of an analysis of data and conclusions, together with its appendices. While MDS Consultants have been deputed to assist the Pourashava / Executing Agency (EA) for the preparation of the IEE, the responsibility and ownership of the IEE rest with the EA. The key elements of the IEE Report focus on: Assessment of Compliance Guidelines of Environment Safeguards according to ADB, AFD and GoB policy.

DISCLAIMER

This Initial Environmental Examination (IEE) Report of Bhanga Pourashava, Under Management Design & Supervision Consultants for Improving Urban Governance and Infrastructure Program (IUGIP) based on Result based lending (RBL). All the data used to prepare this Initial Environmental Examination (IEE) Report have been collected from the Pourashava Development Plan (PDP). Some of the information's have also been collected from the Pourashava personnel over telephone. Moreover, some information's have been collected by the respective experts of MDS 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 event and we express apology for that.

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EXECUTIVE SUMMARY

1. The Government of Bangladesh (GoB) has undertaken the Improving Urban Governance and Infrastructure Program (IUGIP) with financial assistance from the Asian Development Bank (ADB) & Agence Francaise De-developpment (AFD). The Improving Urban Governance and Infrastructure Program (IUGIP) under the Result Based Lending (RBL) modality will improve infrastructure facilities such as drains, roads, streetlights, low-income neighborhoods improvement (footpaths, drains, streetlights, tube wells, dustbins and community toilets), market centers and parks in selected 63 Pourashavas of operation and maintenance (O & M) in 25 Pourashavas. (Out of 88 Pourashavas).

2. Environmental Assessment and Review Framework (EARF) was prepared and endorsed by both the funding agencies and GoB to be adopted for implementation of the IUGIP. The frameworks specified the screening procedures and the guidelines for identifying the APs, estimating the compensation and assistance to be paid for the losses, grievance redress mechanism, preparation of IEE and the institutional requirements for monitoring the implementation of environmental safeguard aspects of the project. The IEE for roads and drains sub-project of Bhanga Pourashava has been prepared following the PPTA and updated format.

3. For monitoring the implementation of environmental safeguard aspects of the project. The IEE for roads and drains sub-project of Bhanga Pourashava has been prepared.

    - Variety of sub-projects have been undertaken under IUGIP, potential environmental impacts of a local nature can be expected and cover a wide spectrum. Accordingly, the criteria for selection or exclusion of sub-projects address concerns related to potential significant or irreversible negative environmental impacts.
    - Potential environmental impacts stem from poor or improper location, planning and design practice. Construction impacts in a local setting and within the local community can be significant, even though of short duration and limited extent.
    - Government of Bangladesh (GoB) law and ADB policy require that the environmental impacts of development projects 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 has become an integral part of all ADB lending operations, project development and implementation.
    - The objectives of the Road and Drainage Improvement sub-project are to access and;
    - Improve the urban environment through - Rehabilitation/Maintenance/Construction of roads and drains on various locations in Bhanga Pourashava area.

4. **Categorization:** Bhanga Pourashava road and drain sub-project is classified as Environmental Category B as per ADB SPS as no significant impacts are envisioned. This initial environmental examination has been prepared in accordance with ADB SPS's requirements for environment category B projects and provides mitigation and monitoring measures to ensure no significant impacts because of the sub-project.
    - The project has been classified as environment 'Category B' by criteria in the Environment Policy of the ADB and Environmental Assessment Guidelines

(November 2002) as applied by the ADB Urban Development Division, South Asia Department. Category B projects are "judged to have some adverse environmental impacts, but of lesser degree and/or significance than those for category A projects." As a result, "an initial environmental examination (IEE) is required to determine whether or not significant environmental impacts warranting an EIA are likely."

- As per Government of Bangladesh Environment Conservation Act, 1995 and revised Environment Conservation Rules (ECR, 2023) section-1, the sub-projects of under IUGIP project are not applicable. However, Markets, parks, slaughter house, street lights, toilets and bus & truck terminals are in orange category which are included in this project. As a result, "an initial environmental examination (IEE) is required to determine.
- The DoE has issued an Environmental Clearance Certificate (ECC) for Improving Urban Governance and Infrastructure Program (IUGIP), **vide letter 22.02.0000.018.72.029.23.177 dated 25.06.2023. (DoE approved of ECC Appendix -7)**
- The objectives of the sub-project are (i) the sub-project will facilitate the local people smooth communication and reduce water logging, traffic jam in proposed location.

5. **Sub-project Scope:** The Construction/ Improvement of Roads 5328.00 m in 4 locations, Protection Work 362.00m, Construction of Drain 1493.00m in 4 locations, Construction RCC Box Culverts (2V) (One (1) nos. at Chilladharchar Basto Khola Road (Ch-2273.00m) & installation of Street Light 185 nos. at Bhanga Pourashava, Faridpur District.

Environmental Safeguard Policy Principal Triggered

6. The environmental and indigenous peoples' safeguards principles likely to be triggered due to the RBL program activities are given in Table 1. Summary of Government of Bangladesh environmental and safeguard regulatory framework and a comparative analysis with ADB policy principles is presented in national legislations.
7. **Indigenous Peoples Safeguards, ADB Safeguard Policy Statement, 2009. If incase**; The Indigenous Peoples safeguards are triggered if a project directly or indirectly affects the dignity, human rights, livelihood systems, or culture of Indigenous Peoples or affects the territories or natural or cultural resources that Indigenous Peoples own, use, occupy, or claim as an ancestral domain or asset. ADB SPS, 2009 uses the term Indigenous Peoples in a generic sense to refer to a distinct, vulnerable, social, and cultural group possessing the following characteristics in varying degrees:

- self-identification as members of a distinct indigenous cultural group and recognition of this identity by others;
- collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories;
- customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture; and
- a distinct language, often different from the official language of the country or region.

Table 1: Environment Safeguard Policy Principal Triggered

Principles*	Triggered by the RBL program	Descriptions
Environmental Safeguard		
Principle 1: project screening process	Yes	Potential environmental impacts of proposed RBL activities are likely to be minimal, Screening will be under taken to including following activities:(i) classified as **Category B** and requiring IEE study under ADB SPS, (ii) those classified as 'Not specified**'** category and no requiring IEE study under GoB revised ECR 2023. A screening form, combining both ADB and ECR requirements, will be introduced.
Principle 2: Conduct of environmental assessment	Yes	The environmental impacts of RBL activities during construction and operation needs to be assessed through conduct of environmental assessment. Per ADB SPS, some RBL activities fall under Orange-B category, requiring an IEE. As per ECR 2023, do not need IEE or EIA. A process/framework will be introduced that all RBL activities go through environmental assessment.
Principle 3: Examine alternatives to the project	Yes	RBL activities are simple and straight forward with minimal impacts. Examination of alternatives will further reduce the impacts in aspects like avoiding locations with trees, water bodies, arsenic contaminated water as water source, etc.,
Principle 4: Avoid, minimize, mitigate, and/or offset adverse impacts	Yes	Program activities will require mitigation measures to address environmental impacts. EMP will be required as part of the IEE. EMP will need to clarify implementation arrangements and costs.
Principle 5: Carry out meaningful consultation	Yes	Consultations will be required with the affected persons and stakeholders during the project preparation and implementation. Public feedback and grievance redress system is crucial for avoiding / reducing inconveniences and health and safety risks during construction.
Principle 6: Disclose a draft environmental assessment (including the EMP)	Yes	Disclosure of documents is required to update the affected people and stakeholders on the proposed RBL activities, likely impacts, and mitigation and monitoring measures, and implementation arrangements. IEEs, including EMPs, and monitoring reports during implementation will be disclosed.
Principle 7: Implement EMP and monitor its effectiveness	Yes	Implementation of EMPs and monitoring effectiveness, reporting and disclosure is needed. Contractors will implement the EMPs, and LGED will monitor, report and disclose. Budget to implement EMP Will be included in the project cost.
Principle 8: Avoidance of critical habitats	No	The RBL program activities will be mostly confined to urban areas. No activities will be located in or near critical habitats**.**
Principle 9: Apply pollution prevention and control technologies and practices	Yes	Given the small-scale of construction activities, the potential for pollution is minimal, and is mostly confined to construction phase environment, health and safety impacts. RBL activities will need to be implemented applying government pollution control and EHS requirements, and World Bank Group's EHS guidelines. RBL activities unlikely to use or generate any notable hazardous materials or waste.
Principle 10: Workers' health and safety	Yes	RBL activities involve construction and operation of infrastructure. Health and safety risks are inherent to civil works, both to workers, and surrounding community, especially since the works will be conducted in public areas

Principles*	Triggered by the RBL program	Descriptions
Principle 11: Conserve physical cultural resources	Yes	RBL program activities will not be implemented in or close to archeologically, historically sensitive sites. There may however be local religious/cultural places within the town and along the roads where infrastructure will be located. Necessary measures avoid any impacts, including chance-find Procedures will be included in EMPs
Principle 1: Project screening for Indigenous Peoples impacts.	Yes	All components or activities will be screened to determine whether any Indigenous Peoples/ TMRES communities are present and affected by the RBL program.
Principle 2: Undertake a culturally appropriate and gender-sensitive social impact assessment	No	There have a small group of TMRES live in the Pourashava. There will be no environmental impact during construction by IUGIP.
Principle 3: Undertake meaningful consultations with affected Indigenous Peoples communities and establish a culturally appropriate and gender inclusive grievance mechanism	No	For any activity or component is undertaken in Pourashvas, where TMRESC (Indigenous Peoples) live in a cluster or small groups, consultations will be carried out to ensure that the RBL program benefits are accessible to Indigenous Peoples/ TMRES communities in a culturally appropriate manner.
Principle 4: Broad community support for project activities	No	The RBL program will not take up any activity, which may cause the commercial development of the cultural or natural resources or traditional or customary lands.
Principle 5: Avoid, to the maximum extent possible, any restricted access to and physical displacement from protected areas and natural resources.	No	The RBL program will exclude any such activity.
Principle 6: Preparation of IPP	No	No adverse impacts to Indigenous Peoples/TMRESC assess under the RBL program; only affected group are impact assessed on Indigenous Peoples/ TMRESC in the Pourashava. The TMRESC Plan will be prepared, which will include a specific action plan for consultation and participation of indigenous peoples.
Principle 7: Disclose a draft and final IPP in form and language(s) understandable to affected Indigenous Peoples communities	No	Any Resettlement and TMRESC Plan prepared will be disclosed on LGED website and to TMRESC in language understood by them.
Principle 8: Prepare an action plan for legal recognition of customary rights to lands and territories or ancestral domains.	No	The customary rights to lands and territories or ancestral domains will not be impacted under the program.
Principle 9: Monitor implementation of the IPP and disclosure of monitoring reports.	Yes	The monitoring of the Indigenous Peoples related actions and measures will be conducted during the implementation of the RBL program by LGED.

EIA = environmental impact assessment, IEE = initial environmental examination, EHS = environmental, health and safety, IPP = indigenous people's plan, LGED = Local Government Engineering Department, PSSA = program safeguard systems assessment, RBL = results-based lending, TMRESC = Tribes, Minor Races, Ethnic Sects and Communities. Source: Asian Development Bank, Safeguard Policy Statement, 2009.

8. There is no impact on indigenous people as there are no indigenous people around the project site.

9. **Description of the Environment:** Sub-project components are located in Bhanga Pourashava urban area or in its immediate surroundings which were converted into urban land

use for many years ago, and there is no natural habitat left at these sites. There are no protected areas, cultural heritage site, wetlands, mangroves, or estuaries in or near the sub-project location. There are no forest areas within or near Bhanga Pourashava.

10. **Environmental Management:** An environmental management plan (EMP) is included as part of this IEE, which includes (i) mitigation measures for environmental impacts during implementation; (ii) an environmental monitoring program and the responsible entities for mitigating, monitoring, and reporting; (iii) public consultation and information disclosure; and (iv) grievance redress mechanism. A number of impacts and their significance were reduced through mitigation measures in the preliminary design stage. The EMP will form part of the civil work bidding and contract documents.
    - Locations and sitting of the proposed infrastructures were considered to further reduce impacts. The concepts considered in design of the Bhanga roads & drains Sub-project are: (i) locating facilities on government-owned land to avoid the need for land acquisition and relocation of people; (ii) prioritizing rehabilitation over new construction using public right of ways (ROWs), and taking all possible measures in design and selection of site or alignment to avoid resettlement impacts; (iii) avoiding where possible locations that will result in destruction/disturbance to historical and cultural places/values; (iv) avoiding tree-cutting where possible; (v) ensuring all planning and design interventions and decisions are made in consultation with local communities and reflecting inputs from public consultation and disclosure for site selection.
    - MDSC design team integrate a number of measures, both structural and non-structural, to mainstream climate resilience into the Bhanga Pourashava Road and drain sub-project, including: (i) structural protection of facilities of future floods; (ii) location of components where there is no risk of flooding or other hazards and promote more efficient use of Pourashava resources accordingly as per public demand. As a result, some measures have already been included in the sub-project designs. This means that the impacts and their significance have already been reduced.
    - Key construction phase impacts identified and addressed in the IEE include (i) air, noise and vibration impacts due to construction vehicles, equipment and machinery in the vicinity of construction site and inhabited sections; (ii) management of Soils due to excavation for distribution network and civil works; (iii) safety measures during construction; (iv) traffic diversions; (v) management of sites temporarily used for construction activities, including borrow areas, construction camps, etc. and rehabilitation of the sites after completion of temporary use; (vi) impacts on community health and safety hazards posed to the public, specifically in inhabited areas. The debris from the demolition of the existing road and drain at site will be used in the emergency repair, new construction and maintenance of roads in the Pourashava area.

11. In the operational phase, all facilities and infrastructure will operate with routine maintenance, which should not affect the environment. During the construction period environmental impacts will be minimize as the work following the EMP and take proper mitigation measures. Mitigation measures have been developed to reduce all negative impacts to acceptable levels and will be assured through a program of environmental monitoring. The monitoring program will include observations on and off-site, document checks and

interviews with workers and beneficiaries. The PMU will submit semi-annual monitoring reports to ADB which will include a detailed review of EMP implementation, including corrective actions taken.

12. **Consultation, Disclosure and Grievance Redress:** The stakeholders were involved in developing the IEE through discussions on-site and public consultation, after which views expressed were incorporated into the IEE and in the planning and development of the sub-project. The IEE will be made available at public locations in the Pourashava and will be disclosed to a wider audience via the ADB and LGED project websites. 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 to ensure any public grievances are addressed quickly.

13. **Monitoring and Reporting**: The PMU, PIU (Bhanga Pourashava), and Management Design and Supervision Consultants (MDSC) will be responsible for safeguard monitoring. The MDSC will submit monthly monitoring reports to PMU, and the PMU will send semi-annual monitoring reports to ADB. ADB will post the semi-annual environmental monitoring reports on its website as part of its disclosure requirements.

14. **Conclusion and Recommendations:** The citizens of Bhanga Pourashava will be the major beneficiaries of this sub-project. The sub-project will facilitate the local people smooth communication and reduce water logging, traffic jam in proposed location. In addition to improved and maintained environmental conditions, the sub-project will also construct roads and drains improvement infrastructure, proper drain slop maintain for outfall etc. Therefore, the proposed sub-project is unlikely to cause significant adverse impacts and net environmental benefits to citizens of Bhanga Pourashava will be positive. The potential impacts that are associated with design, construction and operation can be mitigated to standard levels without difficulty through proper engineering design provided that the EMP is included in the contract document and its provisions implemented and monitored to their full extent.
    - Based on the findings of the IEE, there are no significant impacts and the classification of the sub-project as Category “B” is confirmed. No further special study or detailed environmental impact assessment (EIA) needs to be undertaken to comply with ADB SPS, (2009).

I. INTRODUCTION

A. Background

15. Bangladesh has a population of approximately 162 million and experienced rapid urbanization with the growth of many secondary towns over the last three decades. About 28 per cent of the total population now lives in urban areas where the population growth rate is much higher than the overall national growth rate. With the present high increase-trend in urban population, it is justifiably anticipated that by year-2020, such population will constitute nearly 40 percent of the national aggregate. One principal cause of such rapid growth is the presence of better opportunities spanning economic, communication, education, health and other social aspects in the urban areas.

16. Proposed Project Readiness Services of Result Based Lending (RBL) for Improving Urban Governance and Infrastructure Program (IUGIP) with financial assistance from the Asian Development Bank (ADB) and AFD are for Urban Development in 63 Pourashavas. The selected Pourashavas are: 1) Bandarban 2) Brahmanbaria 3) Banshkhali 4) Chandanaish 5) Nazirhat 6) Raozan 7) Sandwip 8) Faridganj 9) Hajiganj 10) Matlab South 11) Sundarganj 12) Sonagazi 13) Khagrachhari 14) Raipur 15) Ramganj **16) Bhanga** 17) Chowmuhani 18) Basurhat 19) Rangamati 20) Ramgati 21) Boalmari 22) Kaliganj 23) Kaliakair 24) Tungipara 25) Bhairab 26) Hossainpur 27) Pakundia 28) Kalkini 29) Manikganj 30) Munshiganj 31) Mirkadim 32) Araihazar 33) Monohordy 34) Goalanda 35) Naria 36) Modhupur 37) Alamdanga 38) Keshabpur 39) Monirampur 40) Mohespur 41) Bheramara 42) Kumarkhali 43) Gangni 44) Gafargaon 45) Madan 46) Nokla 47) Shariakandi 48) Rohanpur 49) Shibganj 50) Nazipur 51) Santhia 52) Bagha 53) Bhabaniganj 54) Charghat 55) Keshorhat 56) Naohata 57) Rangamati 58) Ulipur 59) Patgram 60) Chunarughat 61) Kulaura 62) Moulvibazar and 63) Chatak .

17. 25 Pourashavas Operation and Maintenance (O & M) are selected Pourashavas as- 1) Barguna 2) Pirojpur, 3) Nabinagar, 4) Laksam 5) Laxmipur, 6) Gopalganj,7) Kishoreganj, 8) Rajbari, 9) Chuadanga 10) Benapole 11) Jashore, 12) Magura, 13) Meherpur, 14) Muktagacha 15) Netrakona, 16) Sherpur, 17) Chapai Nawabganj, 18) Joypurhat 19) Naogaon, 20) Bera 21) Ishwardi, 22) Shahjadpur, 23) Lalmonirhat, 24) Nilphamari 25) Panchagarh

18. IUGIP, RBL Program Scope; The RBL Program will support the construction of infrastructure facilities such as drains, roads, water supply infrastructure (water hand pumps and /or bore wells), low-income neighborhoods upgradation, toilet blocks, footpath, tree plantation, improvement in market areas, etc. The scope of the RBL program is summarized in Table.

Item	Results-Based Lending Program
Outcome	Services and municipal governance in target Pourashavas enhanced.
Key outputs	(i) Institutional capacity strengthened for inclusive municipal governance. (ii) Green and resilient municipal infrastructure improved in quality, access, and gender-responsiveness.
Activity types	Improving municipal governance and services, providing gender responsive, green, resilient municipal infrastructures, improving low-income neighborhoods areas.

19. Infrastructure sub-projects proposed under IUGIP encompass a variety of types of urban infrastructure and services including those shown in Table 1.

Table I-1: Sub-projects and Components Proposed in IUGIP(RBL)

Sector / sub projects	Activities	Components
Urban Transport & communication	Road way Provision	Bridge Replacement
		Drainage/Culverts
		Roadway Widening/Resurfacing
Urban Drainage	Road way Drainage	Roadside Drains
	Area drainage	Outfall
		Main Drain
		Secondary and Tertiary Drains
		Retention Pond
Public use facilities	Municipal facilities	Market/Community Centres
		Municipal and Kitchen Markets
		Improvement of Slaughter houses
		Parks, Bus and Truck Terminals
		Street lights
		Footpaths
Low Income Neighborhood (LIN)	System improvement	Repair/Replacement of Lines
	Community Facility	Community Toilets
	Septic tank	Vacuum Units

20. The overall objectives of the Project are (i) strengthen pro-poor and gender responsive urban governance and improve urban infrastructure and service delivery in sample 63 Pourashavas in Bangladesh (ii) develop these Pourashavas in an integrated and holistic way both in terms of governance and infrastructure. Featured by improved municipal services delivery, financial sustainability, citizen participation, accountability, inclusiveness, transparency and urban development control (iii) roll out application of governance criteria linked with budget allocation to all Class-C Pourashava in the country.

B. Sub-project Scope

21. The Construction/ Improvement of Roads 5328.00 m in 4 locations, Protection Work 362.00m, Construction of Drain 1493.00m in 4 locations, Construction RCC Box Culverts (2V) (One (1) nos. at Chilladharchar Basto Khola Road (Ch-2273.00m) & installation of Street Light 185 nos. at Bhanga Pourashava, Faridpur District.
22. The objectives of the sub-project are the roads and drains improvement infrastructure will facilitate the local people smooth communication and reduce water logging, traffic congestion in proposed location.

C. Purpose of the Report

23. The initial environmental examination aims to provide guidance on safeguard screening, assessment, institutional arrangement, and process to be followed for components of the project, where design takes place after Boards approval. This IEE (i) describes the project and its components; (ii) explains the general anticipated environmental impacts and mitigation measures for the sub-projects; (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 ADB'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 IEE is to ensure, in line with ADB EARF, that the roads & drains sub-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

24. A Sector Initial Environmental Examination (SIEE) has been conducted for the overall IUGIP project and IEEs was prepared for each of the Pourashava sub-projects individually. The SIEE sought to identify any regional and cumulative impacts that may result from the sector intervention. Cumulative impacts were all in the social or human development sphere of the environment, and all were found to be positive. No direct cumulative or regional potential negative impact of the project activities on environmental resources and values was detected.
25. From the variety of sub-projects undertaken under IUGIP, potential environmental impacts of a local nature can be expected and cover a wide spectrum. In general, these 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. Even the criteria for selection or exclusion of sub-projects address potential significant or irreversible negative environmental impacts.
26. The ADB has categorized IUGIP project as Category B and following its normal procedure has determined that an IEE will be conducted for each sub-project submission. The impacts of sub-projects will be assessed according to ADB requires the consideration of environmental issues in all aspects of the operations and the requirements for environmental assessment are described in ADB Safeguard Policy Statement (SPS), 2009.
27. An environmental assessment using ADB Rapid Environmental Assessment (REA) checklist for roads and drains was conducted and results of the assessment show that the sub-project is unlikely to cause significant adverse impacts. Bhanga Pourashava roads and drains sub-project is classified as Environmental Category B as per ADB SPS as no in-significant impacts are envisioned. This initial environmental examination has been prepared in accordance with ADB SPS's requirements for environment category B projects and provides mitigation and monitoring measures to ensure no significant impacts because of the sub-project.
28. Bhanga Pourashava road and drain sub-project is classified as Environmental Category B as per ADB SPS as no significant impacts are envisioned. This initial environmental examination has been prepared in accordance with ADB SPS's requirements for environment category B

projects and provides mitigation and monitoring measures to ensure no significant impacts because of the sub-project.

E. Scope of this Report

29. This report fulfils the requirements of IEE under the provisions of the ECR. The IEE identifies potential environmental and social impacts and issues associated with undertaking the proposed sub-project. It provides an outline of the potential positive and negative impacts because of the Project and proposes suitable mitigation and management measures. The scope of this report and the subsequent IEE is specific to the sub-project. It does not provide any assessment for any other/future developments or activities at the location or anywhere else within Bhanga Pourashava. Should any further development be planned as result of either this sub-project or other related work, additional planning and assessment to the requirements of the GOB must be carried out specifically in relation to that proposed development.
30. The IEE report aims to provide guidance on safeguard screening, assessment, institutional arrangement, and process to be followed for components of the project, where design takes place after approval. This IEE:
    - Describes the project and its components;
    - Explains the general anticipated environmental impacts and mitigation measures for the sub-projects;
    - 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 ADB'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 IEE is to ensure, in line with ADB EARF, that the sub-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.
31. This report fulfils the requirements of IEE under the provisions of the ECR. The IEE identifies potential environmental and social impacts and issues associated with undertaking the proposed sub-project. It provides an outline of the potential positive and negative impacts because of the Project and proposes suitable mitigation and management measures.
32. The scope of this report and the subsequent IEE is specific to the sub-project. It does not provide any assessment for any other/future developments or activities at the location or anywhere else within Bhanga Pourashava. Should any further development be planned as result of either this sub-project or other related work, additional planning and assessment to the requirements of the GoB must be carried out specifically in relation to that proposed development.

F. Approach and Methodology

33. The primary purpose of the IEE is to investigate and describe impacts of the proposed sub-project to the existing environmental elements. Specifically, the study aims to predict the potential impacts of the project activities and recommend mitigation and abatement measures

for impacts (in the pre-construction, construction, after completion of works and operational stages of development) that are considered potentially adverse to the surrounding environment.

- The primary purpose of the IEE is to investigate and describe impacts of the proposed sub-project to the existing environmental elements. Specifically, the study aims to predict the potential impacts of the project activities and recommend mitigation and abatement measures for impacts (in the pre-construction, construction, after completion of works and operational stages of development) that are considered potentially adverse to the surrounding environment.
- 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 sub-project and recommend appropriate short-term and long-term management plans.

a. Data Sources of IEE

34. The following documents were used as reference in the preparation of the IEE report:
    - Available technical reports from Pourashava and various organizations
    - Available laws, rules, regulations, acts, policies from Bangladesh Government websites
    - Maps from open sources and various governmental and non-governmental websites
    - Data from secondary literatures including books and relevant websites

b. Scoping and Gathering Baseline Data

35. Scoping of issues to be addressed in the IEE was conducted early in the assessment process (i.e., Safeguard team field visit) to collect the appropriate baseline information so that collected and the IEE report/study can be focused on the relevant issues needed.

    The objectives of undertaking the scoping activities were:

    - To provide an early link among the implementing agency, the recipient and affected community and the IEE preparer;
    - To ensure that the IEE will address only relevant issues and concerns;
    - To present the scope of environmental studies, issues and alternatives that requires thorough examination and consideration in the master plan; and
    - To ensure complete coverage of potential environmental and social issues that is required under the ADB Environmental and Social Considerations.

G. Structure of This Report

36. Following the ADB SPS 2009, the Report is structured as follows:

Contents at A Glance

Chapter I Introduction provides the background on the sub-project, purpose of this report, approach and methodology

Chapter II Policy, Legal, and Administrative Framework presents a review of relevant national laws and policies, international environmental obligations, and ADB's environmental requirements, procedure of environmental clearance, environmental categorization

Chapter III Description of the sub-project provides a brief description of the Project, the location, size and need, description of sub-project components

Chapter IV Description of the Baseline Environment includes details on the baseline data for environmental conditions in the sub-project area (current features and conditions, pre-project)

Chapter V 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 management plan that includes the impacts of the proposed sub-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 capacity building, costs of monitoring and capacity building activities and reporting obligations

Chapter X This chapter includes the conclusion and some recommendations are suggested here about the proposed sub-project.

II. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

A. Introduction

37. ADB will not finance any project if it does not comply with ADB SPS nor will it finance any project if it does not comply with its host country's environmental and social safeguard laws. Where discrepancy between ADB and Government of Bangladesh policies exist, ADB's policy will prevail. Moreover, ADB SPS applies to all ADB-financed and/or ADB-administered sovereign projects, and their components regardless of the source of financing, including investment projects funded by a loan; and/or a grant; and/or other means.

B. ADB Safeguard policy Statement

a. Overview of the Sub-project Approval Process

38. ADB SPS requires borrowers to meet a set of requirements (Safeguards Requirements 1) when delivering environmental safeguards for projects supported by ADB. The objectives are to ensure the environmental soundness and sustainability of projects, and to support the integration of environmental considerations into the project decision-making process. Hence, IUGIP is required to comply with these requirements. A summary of the step-by-step process is discussed below in this section. Detailed discussions are provided in the ADB SPS.

39. The ECR, 2023 also provides the environmental standards applicable to IUGIP. Schedule 2 of the ECR presents the national standards for ambient air quality and Schedule 4 of the ECR presents the national standards for ambient noise. Following the requirements of ADB SPS, the subproject shall apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in the World Bank's Environmental Health and Safety (EHS) Guidelines. When the Government of Bangladesh's regulations differ from these levels and measures, the subproject shall comply with whichever is more stringent. If less stringent levels or measures are appropriate in view of specific subproject circumstances, LGED through PMU will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS

b. Application for Environmental Clearance

40. Key The application and requirement for issuance of ECC are described in ECR, 2023 and summarized in Table 1. This involves the completion and submission of an application using a form available from the DOE website, which is revised from time to time. The accomplished application form together with requirements are submitted to DOE together with requirements as enumerated in Table 1. The proponent is also required to pay equivalent application fee prescribed in Schedule 7 of ECR, 2023

    The ECC shall be issued within 30 days from the DOE's receipt of the application. Such ECC shall be renewed every year from the date of its effectivity. For IUGIP, the PMU shall be responsible for the application for and renewal of ECC.[1]However, the renewed ECC of IUGIP is

[1] Application for the ECC for IUGIP will be made in due time.

valid till the project ending date.

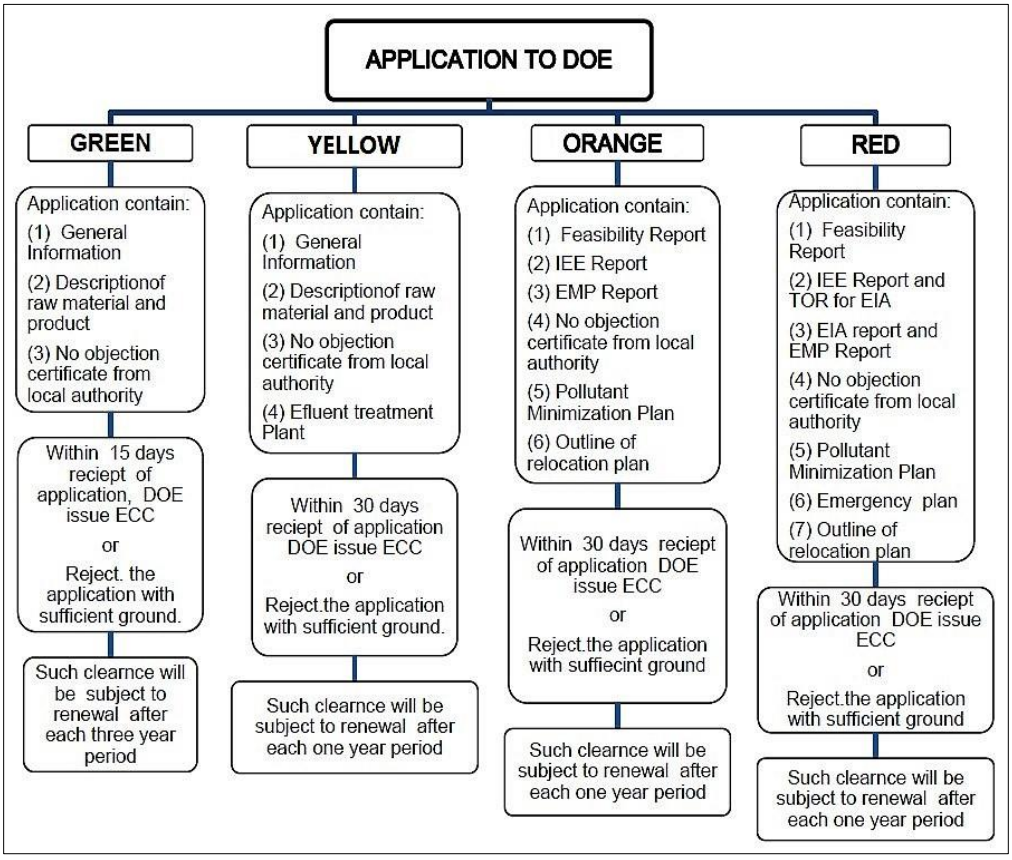


Figure II-1: Government of Bangladesh Environmental Clearance Process

C. National Environmental Impact Assessment Law

41. **Environmental Conservation Act (ECA), 1995 (Amended 2010).** Provides for the conservation of the environment, improvement of environmental standards, and control and mitigation of environmental pollution. Among others, this Act empowers the Department of Environment (DOE) to (i) require violators to undertake remedial measures for injury to the ecosystem, (ii) take necessary remedial measures to control or mitigate environmental pollution, (iii) inspect any activity for testing any equipment or plant for compliance to the environment act, including power to take samples for compliance; (iv) make rules and standards with reference to environment; and (v) impose penalties for non-conformance to environment act under the various sections. In line with these provisions of the Act, the Environmental Conservation Rules, 1997 have been framed.

a. National Environmental Policy

42. **Environmental Conservation Rules (ECR), 2023.** The Rules outline the processes and requirements of environmental clearances for specific type of projects indicated therein, and stipulates that "no industrial unit or project shall be established or undertaken without obtaining, in the manner prescribed by rules, an ECC from the Director General" of the DOE. Schedule 1 of the Rules classifies industrial units and projects into four categories according to their site and impact on the environment, namely (i) green, (ii) yellow, (iii) orange, and (iv) red. The rules specify the procedures for issuing ECC for the various categories of projects. **Table II-2** summarizes the requirements for environmental clearance application for each category.

Table II-1: Summary Environmental Clearance Application Requirements per Category

Category	Requirements
Green	a) Completed Application for Environmental Clearance Certificate (ECC); b) Payment of the appropriate fee based on Schedule 3 of ECR 1997 (amended 2023); General information about the project; c) Exact description of the raw materials to be used and the product to be manufactured (where relevant); and d) No objection certificate from the local authority.
Yellow	a) Completed Application for ECC; b) Payment of the appropriate fee based on Schedule 3 of ECR,1997 (amended 2023); c) General information about the project; d) Exact description of the raw materials to be used and the product to be manufactured (where relevant); e) No objection certificate from the local authority; f) Prior issued location clearance certificate (LCC) from DOE; g) Process flow diagram; h) Layout plan (showing location of Effluent Treatment Plant (ETP); i) Effluent discharge arrangement; and j) Outlines of the plan for relocation and rehabilitation (if applicable).
Orange	a) Completed Application for ECC; b) Payment of the appropriate fee based on Schedule 3 of ECR, 1997 (amended 2023); c) Report on the feasibility of the project (if still being proposed); d) Report on the initial environmental examination (IEE) of the project, including process flow diagram, layout plan (showing ETP), design of ETP of the project (if still being proposed); e) Report on the EMP; f) No objection certificate from the local authority; g) Prior issued LCC from DOE; h) Emergency plan relating to adverse environmental impact and plan for mitigation of the effect of pollution; i) Outline of the relocation and rehabilitation plan (where applicable); and j) Other necessary information as may be required.
Red	a) Completed Application for ECC; b) Payment of the appropriate fee based on Schedule 3 of ECR,1997 (amended 2023), c) Report on the feasibility of the project (if still being proposed); d) Report on the IEE of the project and the terms of reference (TOR) for environmental impact assessment of the project; or EIA report on the basis of the TOR previously approved by DOE, including process flow diagram, layout plan (showing ETP), design of ETP of the project (if still being proposed); e) Report on the EMP;

Category	Requirements
	g) No objection certificate from the local authority; h) Prior issued LCC from DOE; i) Emergency plan relating to adverse environmental impact and plan for mitigation of the effect of pollution; j) Outline of the relocation and rehabilitation plan (where applicable); and k) Other necessary information as may be required.

Source: Bangladesh Ministry of Environment and Forests. August 2010. A Guide to Environmental Clearance Procedure.

B) Environmental Conservation Act (ECA), 1995

43. 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.
44. The main objectives of ECA are:
    - Conservation and improvement of the environment; and
    - Control and mitigation of pollution of the environment.

44. 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 guidelines.

45. 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.
46. The Project will be undertaken in line with the aims and objectives of the Act by conserving the environment and controlling and mitigating potential impacts throughout the drilling program.

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

47. This amendment of the act introduces new rules and restriction on:
    - No individual or institution (Gov. or Semi Govt., / Non-Govt. / 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.
48. **Relevance to the project**: According to this law no industrial unit or project shall be established or undertaken without obtaining, in the manner prescribed by rules, an Environmental Clearance Certificate (ECC) from the Director General.

C) Environment Conservation Rules, 1997 (Amended in 2002)

49. 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.
50. 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.
51. 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-

Teknaf 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.

52. 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.
53. 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 impact assessment (EIA).
54. 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.
55. 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).
56. **Relevance to the project**: In accordance with the Environment Conservation Rules (ECR) of 1997, the sub-Project is classified as Orange-B Category, requiring an Initial Environmental Examination (IEE) to obtain clearance for construction.

D) National Water Policy, 1999

57. 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.
58. Relevance to the project - Clause 4.6b of this policy states that natural depressions and water bodies in major urban areas must be preserved in order to recharge of underground aquifers and rainwater management. Moreover, measures must be taken to minimize disruption to the natural aquatic environment in streams and water channels (Clause 4.9b). In addition, this policy requires each water resources development project or rehabilitation program to give full consideration to environmental protection, restoration and enhancement measures consistent with National Environmental Management Action Plan (NEMAP) and the National

Water Management Plan (NWMP) and adhere to a formal environment impact assessment (EIA) process, if required by the Government (Clause 4.12a and clause 4.12b).

E) Other National Legal Instruments

59. The Ministry of Environment, Forests and Climate Change (MoEFCC) prepare the environmental policies. MoEFCC 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 MoEFCC has adopted number of legal instruments in the form Acts for the protection and conservation of the environment. Table II-1 summarizes the Environmental Legislation applicable to the sub-project.

Table II-2: Summary of Relevant Government Laws, Regulations, and Environmental Standards

Laws, Regulations, and Standards	Details	Relevance/Applicability
National Environmental Policy 2018	The National Environmental Policy 2018 has been adopted in order to ensure sustainable development in the face of various environmental disasters, the effects of climate change and the limitation of natural resources. The main focus of this policy is protecting the environment, controlling pollution, conserving biodiversity and tackling the adverse effects of climate change.	This Policy is applicable to IUGIP as the proposed interventions are required to comply with all policies/ directives particularly on reducing adverse environmental impacts.
National 3R Strategy for Waste Management, 2010	The 3Rs are meant to be a hierarchy, in order of importance – 'reduce' followed by 'reuse' and then 'recycle', which classify waste management strategies according to their desirability. The National 3R goal for waste management is to achieve eliminate waste disposal on open dumps, rivers and floodplains and promote recycling of waste through mandatory segregation at source as well as create a market for recycled products and provide incentives for recycling.	IUGIP is relevant to the National 3R Strategy for Waste Management and will contribute to the elimination of waste disposal on open dumps, rivers and floodplains through improvements on urban drainage systems.
Bangladesh Climate Change Strategy and Action Plan (BCCSAP) 2009	The BCCSAP is built on six pillars: (i) food security, social safety and health; (ii) comprehensive disaster management; (iii) infrastructure; (iv) research and knowledge management; (v) mitigation and low carbon development; and (vi) capacity building. Five programs have been suggested related to improvement of the water management infrastructures under pillar 3 (Infrastructure) of BCCSAP, including planning, design and implementation of resuscitation of the network of rivers and khals through dredging and de-silting works.	IUGIP is relevant to the BCCSAP's programs and will contribute towards achieving the objective of restoration of the network of rivers and khals through dredging and de-siltation work
The Embankment and Drainage Act (1952)	This Act describes the protection of embankments and drainage facilities	The Embankment and Drainage Act (1952) is applicable to IUGIP-3 as the Project will support river embankment and drainage improvements.
The Bangladesh Water Development Board Act, 2000	The Bangladesh Water Development Board Act, 2000 was enacted for the development and efficient management of water resources. The Water Development Board is established under the Act, with the power to control the flow of water in all rivers, channels and underground aquifers.	IUGIP-3 is relevant to the Wetland Protection Act 2000 as the project will involve in maintaining the flow of water in subproject river, and khals/canals.
National Disaster Management Act 2012	The National Disaster Management Act 2012 recognized the impacts of climate change and provides guidance for setting up an institutional mechanism for disaster management, reducing	The National Disaster Management Act 2012 is relevant to IUGIP as it shall

Laws, Regulations, and Standards	Details	Relevance/Applicability
	vulnerabilities, rehabilitation, and providing humanitarian assistance to the victims of both disasters and climate change impacts.	promote disaster-resilient infrastructures
National Land Transport Policy 2004	The National Land Transport Policy, adopted in 2004, which stated that services and infrastructure will be studied so that an analysis can be made of potential opportunities for integration, and competition where appropriate. Transport, including land and water, can also play a vital role to promote low carbon climate resilient development in Bangladesh.	This policy is applicable to IUGIP as it is designed to improve the transportation and/or road network.
Environmental Court Act, 2000	Enacted to establish Environment Courts and make rules for protection of environmental pollution. Environment Courts are situated at the district level but Government may by notification in the official Gazette, establish such courts outside the districts. Environment Courts were given the power to directly take cognizance any offence relating to environmental pollution. The proceedings of this Court will be similar to criminal courts. One important feature of this Act is that it has been given retrospective effect of any crime committed under environment laws and thus any crime previously committed but is not taken before any court can be taken before the Environment Court or any special Magistrate.	IUGIP is relevant to the Environmental Court Act, 2000 as the court has jurisdiction over any subproject-related environmental cases or litigations or complaints elevated to it.
The Pourashava (Municipality) Ordinance of 1977, the City Corporation Ordinances of 1983 and the recently revised unified ordinance for all City Corporations of 14 May 2008 (Local Government Ordinances 16, and 17 of 2008); City Corporation Act 2009, 15 Oct 2009, and; Pourashava Act 2009, 6 Oct 2009.	These ordinances have clearly assigned responsibilities to the local government institutions (LGIs) to ensure the provision of a wide range of primary and public health services including primary health care, sanitation, water supply, drainage, food and drink, birth and death registration, vector and infectious disease control, etc. for the residents. LGIs have the authority to address all related issues within their legal and administrative mandate.	IUGIP aims to help LGIs where subprojects are located to achieve or fulfill these mandates.
National Forestry Policy, 2016	This policy specifically states the following relevant objectives (among many other objectives): (i) to arrest deforestation, and degradation of forest resources, enrich and extend areas under tree cover,	IUGIP is relevant to the National Forestry Policy, 2016 as the development of subproject roads and

Laws, Regulations, and Standards	Details	Relevance/Applicability
	through appropriate programs and projects, to ensure that at least 20% of the country comes under tree cover by 2035, with at least a canopy density of 50%; and (ii) to significantly increase tree cover outside state forest, through appropriate mechanisms, in both public and private land including urban areas.	drainage will have potential tree cutting. However, the subproject EMP will ensure to implement measures to comply with and support the policy objectives.
Bangladesh Labor Act, 2006	The Bangladesh Labor Act, 2006 provides the guidance of employer's extent of responsibilities and workmen's extent of rights to get compensation in case of injury by accident while working.	IUGIP is relevant to the Bangladesh Labor Act, 2006 as this Act provides security and safety of work force during construction period. Compliance with this law will be included in the responsibility of the Contractor.

Notes: IUGIP = Improving Urban Governance Infrastructure Program, DOE = Department of Environment, ECC = Environmental Clearance Certificate, EMP = Environmental Management Plan, IEE = Initial Environmental Examination, LGI = Local Government Institutions

D. Applicable International Agreements

60. 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-3: 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	01.09.1978 04.12.1974 (AC) (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)	1999	20.04.1992 (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) 11.12.1997 (AD)	Reduction of emission of greenhouse gases.

Conventions	Years	Ratified/Accessed (AC)/Accepted (AT)/ Adaptation (AD)	Relevance
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) 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 (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.

Conventions	Years	Ratified/Accessed (AC)/Accepted (AT)/ Adaptation (AD)	Relevance
Convention Concerning Safety in the Use of Chemicals at Work, Geneva.	1990	Signed	Regulating the management of chemicals in the workplaces I order to protect workers from the harmful effects of these substances.
Preparedness, Response and Cooperation (London, 1990.) 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) 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) 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. Environmental Categorization and Standards

a. Environmental Category: DoE

61. 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) Yellow (c) Orange 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/project shall be established or undertaken without obtaining environmental clearance from DoE in the manner prescribed by the rules.

62. Category of RBL Program Activities per ECR, 2023; The Government of Bangladesh as Revised Environment Conservation Rules (ECR, 2023) section-1, the sub-projects of under IUGIP project are not applicable. However, Markets, parks, slaughter house, street lights, toilets and bus & truck terminals are in orange category which are included in this project. As a result, "an initial environmental examination (IEE) is required to determine. Bhanga Pourashava roads and drains sub-project is classified as Environmental Category B as per ADB SPS as no in-significant impacts are envisioned. This initial environmental examination has been prepared in accordance with ADB SPS's. Table II-5 describes DoE classification for roads and drains sub-project.

Table II-4: Category Proposed RBL Activities per ECR, 2023 (Section-1)

RBL Program activity	Components	ADB SPS 2009	Assessment requirements	DoE Classification	Assessment & clearance requirements
Urban roads improvement	Construction, re- Construction and extension of roads (feeder road, local roads)	Category-B	IEE Report	Not applicable	No IEE is required
Urban drains improvement	Primary, Secondary, & Tertiary Drains etc.	Category-B	IEE Report	Not applicable	No IEE is required

Source: Consultant.

b. The DoE has issued an Environmental Clearance Certificate (ECC) for Improving Urban Governance and Infrastructure Program (IUGIP), vide letter vide letter 22.02.0000.018.72.029.23.177 dated 25.06.2023. (DoE approved of ECC Appendix -08).

c. Environmental Category: ADB

63. The Safeguards Policy Statement (SPS 2009) of ADB provides guidance on the environment category of sub-projects based on the degree of anticipated environmental impacts. ADB environmental safeguards objectives are: (i) to ensure the environmental soundness and sustainability of sub-projects and (ii) to support the integration of environmental considerations into the sub-project decision-making process. ADB environmental safeguards are triggered if a project is likely to have potential environmental risks and impacts. 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:

Category A: Project that is likely to have significant adverse environmental impacts which are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An environmental impact assessment (EIA), including an environmental management plan (EMP), is required.

Category B: Project with potential adverse environmental impacts that are less adverse than those of category A projects. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. An initial environmental examination (IEE), including an EMP, is required.

Category C: Project that is likely to have minimal or no adverse environmental impacts. An EIA or IEE is not required, although environmental implications need to be reviewed.

Category FI: Project is classified as category FI if it involves the investment of ADB funds to, or through, a financial intermediary.

The project has been categorized as B for environment under the ADB's Safeguards Policy Statement 2009 (SPS).

F. Institutional Arrangements/Framework

64. The main Ministry, Department, Institutions and Boards responsible for development of policy, framing regulation, developing projects, monitoring and approval of issues related to environment protection and conservation are DoE, LGED and the PIU.

a. LGED and Bhanga Pourashava

65. The Local Government Engineering Department (LGED) is the executing agency. LGED has constituted a Project Management Unit (PMU) and Project Implementation Unit (PIU). The PMU is headed by Project Director (PD). In order to put the project to logical conclusion the PD is assisted by two consultant team to assist and support the PMU and PIU (Project Implementation Unit).

III. DESCRIPTION OF THE SUB-PROJECT

A. The Study Area

66. The Bhanga Pourashava is located in the Bhanga Upazila under Faridpur Zila. The municipality lies between 23°17' and 23°28' north latitudes and between 89°55' and 90°06' east longitudes. Bhanga Pourashava was established on 1st March 1997 and developed as Class A Pourashava in 2013. The Pourashava covers an area of 8.50 sq.km. consisting 9 Wards. The Pourashava is bounded on the north by Tujarpur Union, on the south by Algi Union, on the east by Gharua Union, on the southeast by Chumurdi Union and on the west by Hamirdi Union. A branch of Padma River named Kumar River flows in the middle from north western to southeaster side. The southern and northern parts of the Pourashava are covered by agriculture land. Dhaka-Barisal highway and Dhaka-Mawa-Khulna highway pass through Bhanga upazila. These two roads converged to form a large round square which is now known as Bhanga Expressway. The Pourashava is in flood prone area.

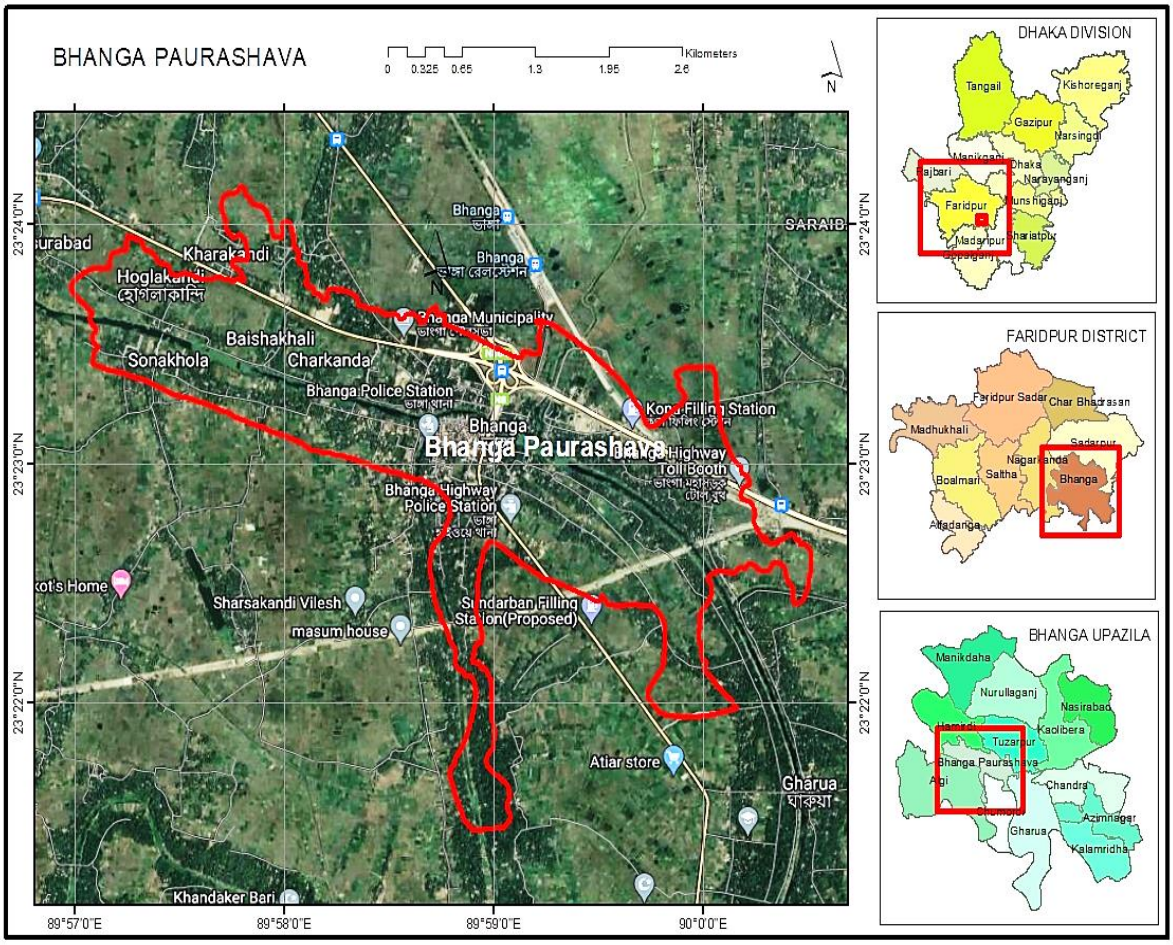


Figure III-1: Bhanga Pourashava Map

67. This report contains the Initial Environmental Examination (IEE) for the roads sub-project of Bhanga Pourashava at Bhanga Upazila of Faridpur District in Dhaka Division (Figure III.1). Sub-project components are located in Bhanga urban area or in its immediate surroundings that were converted into urban use for many years ago, and there are no protected areas, wetlands, mangroves, or estuaries in or near the sub-project location. The Sub-project sites are located in existing right of way (RoWs) and Pourashava/government-owned land.

The Sub-Project

68. The Construction/ Improvement of Roads 5328.00 m in 4 locations, Protection Work 362.00m, Construction of Drain 1493.00m in 4 locations, Construction RCC Box Culverts (2V) (One (1) nos. at Chilladharchar Basto Khola Road (Ch-2273.00m) & installation of Street Light 185 nos. at Bhanga Pourashava, Faridpur District.

Table III-1: Proposed Sub-Project in BHANGA Pourashava

Sl No.	FY	Name of Package	PDP SL	PDP ID No.	Scheme Name/ Name of works	Length (m)
	2024-2025	IUGIP/BHAN/UT+DR/01/2023			**Name of Sub-Project**: Construction/ Improvement of Roads 5328.00 m in 4 locations, Protection Work 362.00m, Construction of Drain 1493.00m in 4 locations, Construction RCC Box Culverts (2V) (One (1) nos. at Chilladharchar Basto Khola Road (Ch-2273.00m) & installation of Street Light 185 nos. at Bhanga Pourashava, Faridpur District.	
1			R-005, 006	___	R-005, 006: Improvement of road by DBC from Faridpur - Barishal Highway to Gozaria Highway Via Razzaq Fakir House a. (Ch. 0.00 m to Ch. 550 m), Faridpur - Barishal Highway to Rail Crossing b. (Ch. 0.00m to Ch. 1010m), Faridpur - Barishal Highway to Fakir Bari c. (Ch. 0.00m to Ch. 355m), d. (Ch. 0.00m to Ch. 531m), Faridpur - Barishal Highway to Nasima House e. ch.00-335m) and Link-f, Ch.00-50m) including Protection Work 315.00 m & installation of Street Light = 100 nos. at ward no. - 02, Bhanga Pourashava, Faridpur. Total Length = 2831.00m.	2831
2			R-007	___	Construction of road by RCC from Bhanga Bazar Eidgah Mour to National Pharmacy Part-a. (Ch. 0.00 to Ch. 290m), a. Link -1 (Ch-0.00m to 20m) , a. Link-2 (Ch. 0.00 to 45.00m), Link-3 (Ch. 0.00m to Ch. 40m), Part- b. (Ch. 0.00m to Ch. 360m), b.Link-1 (Ch.00-45.00m),b.Kink-2(Ch.00-40.00m) And Part- c(Ch.00-100.00m) ,c. link-1 (Ch.00-36.00m),c Link-2 (Ch.0.00-60.00m) & installation of Street Light = 35 nos. at ward no. 08, Bhanga Pourashava, Faridpur. Total Length =1036.00 m.	1036
3			R-013	___	Improvement and widening of road by DBC from Bhanga Thanar Mour to H/O Sahid at Kapuria Sadardi (Ch. 0.00m to Ch. 1107.00m and Link-1: Ch.00-150.00 m.47.00 m Palisading at Ch-1060.00-1107.00 (R/S) & installation of Street Light = 43 nos. at ward no. - 09, Bhanga Pourashava, Faridpur. Total Length =1257m.	1257

Sl No.	FY	Name of Pack-age	PDP SL	PDP ID No.	Scheme Name/ Name of works	Length (m)
4			R-300	___	Construction of RCC road Starting from Dhaka-Khulna Highway near Padma Specialized Hos-pital to Old Pourashava DBC Road Via Shahinur Akter's House Ch.0.00-115.00m, Link-1 road by RCC Starting from Md Shahidul Islam Chunnu House to Kasem House, Ch-0.00-89.00m & installation of Street Light = 7 nos. at ward no. - 04, Bhanga Pourashava, Dist.: Faridpur. Total Length =204.00m.	204
5			Box Culvert-12	___	Box Culvert-12: Construction RCC Box Culverts (2V) (One (1) nos. at Chilladharchar Basto Khola Road (R-002) (Ch-2273.00m) With Approach (7.875X2=15.75m). at Bhanga Pourashava, Faridpur District.	
					Sub Total Road =	**5,328.00**
6			D-001	___	D-001: Construction of RCC Drain from Bhanga Bazar Graveyard to Kumar River via Mohona Garments at Ch. 0.00m to Ch. 237m.Link-1: ch.00 to 36.00 m and Link-2: Ch.00-60.00 m. Ward no. - 08, under Bhanga Pourashava, Faridpur. Total Length = 333.00m.	333
7			D-002	___	D-002: Construction of RCC Drain from Monno Sheikh House to Kumar River at Ch. 0.00m to Ch. 381.0 m and road cross drain Ch.381 to 386.00m ward no. - 01, under Bhanga Pourashava, Faridpur. Total Length = 386m.	386
8			D-004	___	D-004: Construction of RCC Drain with Footpath Starting Dhaka Khulna Highway near Arif Man-jil to kumar River near Old Pourashava via Padma Specialized Hospital & Md Shahidul Islam Chunnu House,at Ch-0.00-555.00m and Link-1 Starting From Md Shahidul Islam Chunnu House to Kasem House via Md Shajahan Mia House at Ch-0.00-89.00m. Ward No-04 Under Bhanga Pourashava, Dist-Faridpur. Total Length=644.00m.	644
10			D-005 (A)	___	D-005 (A): Construction of RCC Drain Starting from Md Nazrul Islam Khan House near Courtpara Road to Jelepara Culvert at Ch-0.00-130.00m. Ward No-04 Under Bhanga Pour-ashava, Dist-Faridpur.	130
					Sub Total Drain =	**1,493.00**

Sl No.	FY	Name of Pack-age	PDP SL	PDP ID No.	Scheme Name/ Name of works	Length (m)
					Grand Total =	**R=5328.00m D=1493.00m**

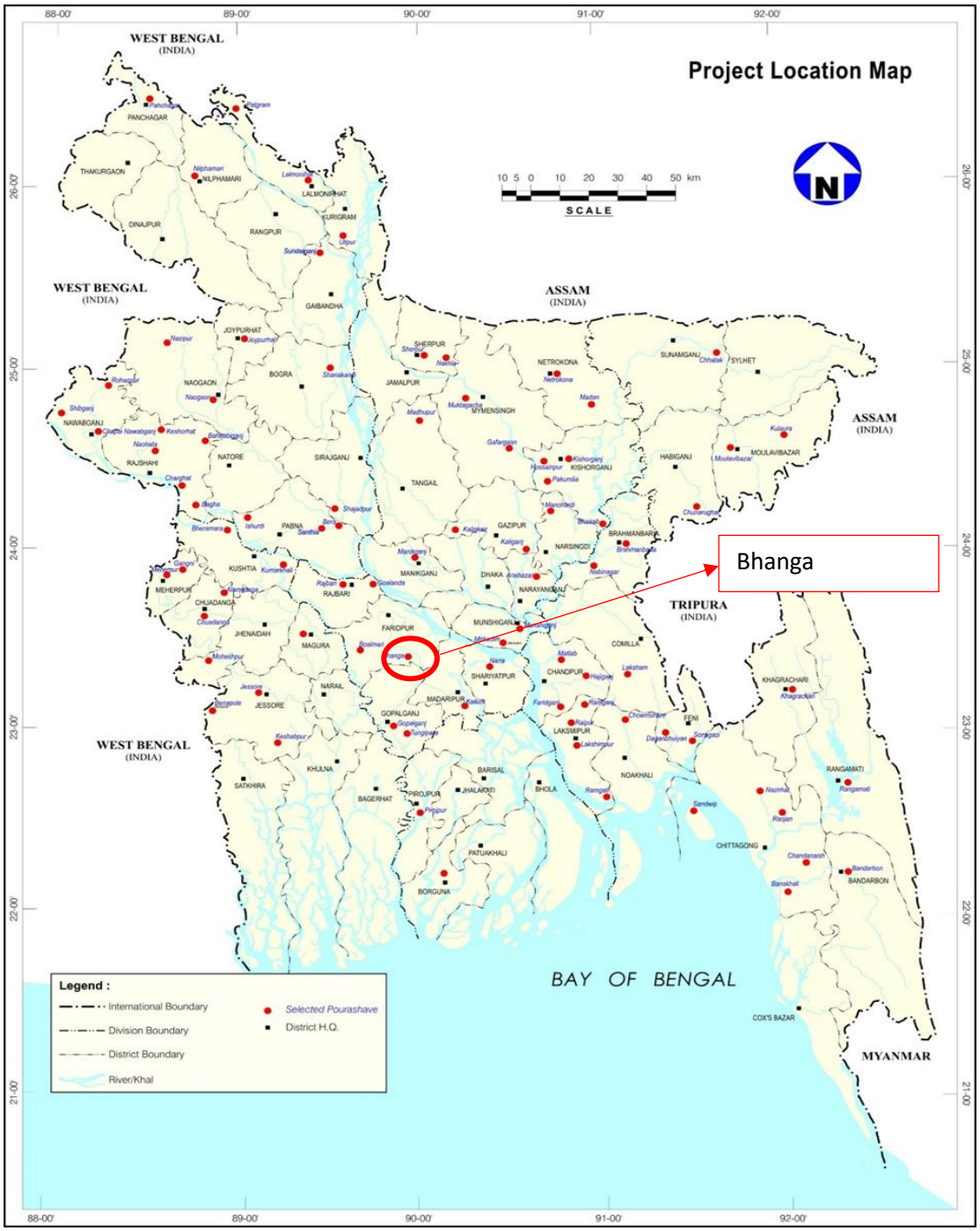


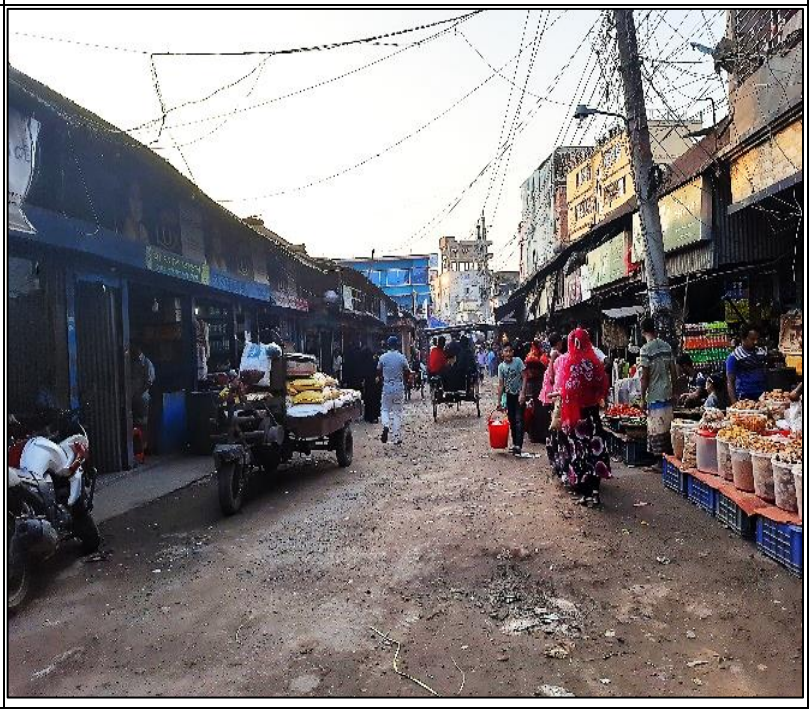
Figure III-2: Pourashavas under IUGIP

a. Existing Condition and Need for the Sub-Project

69. Bhanga Pourashava is a class-A type Pourashava and one of the renowned Pourashava in Bangladesh. Most of these roads have uneven-rough surface, damaged topping and pavement sides, narrow in width and without roadside footpath and thus incapable of accommodating road traffic. The road surfaces are worn out partly and, in some cases, entirely. Justifiably, they call for intervention varying from normal significant maintenance to large improvement/ reconstruction. Due to the presence of canals and ditches on the side of most of the roads, the road shoulders are badly damaged due to the flow of water in the canal. No people/ vehicles can move in this road due to water logging/ damaged condition in rainy season. Traffic congestion, delay, accidents, pedestrian and parking difficulties, air and noise pollution are among the problems. That's why Pourashava demanded the development of this roads through improvement of dense carpeting, RCC road and partial beautification besides road. The nearby urban residents in surrounding locality will be benefited from improvement of the proposed sub-project for creating better business and livelihood opportunities. No economic activities will be impeded resulting losses in income or asset during construction period. There is no need to be acquired any land for the construction as required land is available under the possession of the Pourashava.

70. People can move barely in this street because of water logging/harmed condition in stormy season. That is the reason Pourashava requested the advancement of this channels through progress of thick covering, RCC street and incomplete beautification other than street. It is a decent act of Bhanga Pourashava cleaning the current channels and streets. The close by metropolitan occupants in encompassing area will be profited from progress of the proposed sub-project for making better business and job open doors. No monetary exercises will be obstructed coming about misfortunes in pay or resource during development period. There is compelling reason should be gained any land for the development as required land is accessible under the ownership of the existing area authority.

Table III-2: Existing Condition of Pourashava Roads & Drains

R-007: Construction of road by RCC from Bhanga Bazar Eidgah Mour to National Pharmacy Part-a. (Ch. 0.00 to Ch. 290m), a. Link -1 (Ch-0.00m to 20m) , a. Link-2 (Ch. 0.00 to 45.00m), Link-3 (Ch. 0.00m to Ch. 40m), Part- b. (Ch. 0.00m to Ch. 360m), b.Link-1 (Ch.00-45.00m),b.Kink-2(Ch.00-40.00m) And Part- c(Ch.00-100.00m) ,c. link-1 (Ch.00-36.00m),c Link-2 (Ch.0.00-60.00m) & installation of Street Light = 35 nos. at ward no. 08, Bhanga Pourashava, Faridpur. Total Length =1036.00 m.		
1	Total Length (m)	1036
2	Existing road width (m)	3.0m
3	Existing road surface	DBC
4	Topography	Flat plain
5	Water bodies along the road	Not anticipated
6	Water bodies within 100 m of the road	Yes
7	Trees within the ROW	Not anticipated
8	Approximate number of trees	Not applicable
9	Tree species	Not applicable
10	Number of trees to be removed approxi-	Not applicable
11	Plantation scope on the road sides	Not applicable
12	Utilities in the ROW	Not applicable
13	Land use along the road	Moderately densely populated
14	Traffic on the road	Moderate traffic movement
15	Any other activities on the road:	Not applicable
16	Sensitive areas/structures along the road	Graveyards
17	Photograph	

R-013: Improvement and Widening of road by DBC from Bhanga Thanar Mour to H/O Sahid at Kapuria Sadardi (Ch. 0.00m to Ch. 1107.00m and Link-1 : Ch.00-150.00 m.47.00 m Palisading at Ch-1060.00-1107.00 (R/S) & installation of Street Light = 43 nos. at ward no. - 09, Bhanga Pourashava, Faridpur. Total Length =1257m.		
1	Total Length (m)	1257
2	Existing road width (m)	2.5m
3	Existing road surface	Earthen
4	Topography	Flat plain
5	Water bodies along the road	Not anticipated
6	Water bodies within 100 m of the road	Yes
7	Trees within the ROW	Not anticipated
8	Approximate number of trees	Not applicable
9	Tree species	Not applicable
10	Number of trees to be removed approxi-	Not applicable
11	Plantation scope on the road sides	Not applicable
12	Utilities in the ROW	Not applicable
13	Land use along the road	Moderately densely populated
14	Traffic on the road	Moderate traffic movement
15	Any other activities on the road:	Not applicable
16	Sensitive areas/structures along the road	Not applicable
17	Photograph	

b. Design Concept

71. The design considerations adopted for design were as follows:

i. LGED's Road design manual and standards followed. The road design type 6 for BC pavement was considered, with some modifications;

ii. Guidelines on climate change resilience and adaptation measures were studied and accommodated as necessary; and Existing bitumen finished surface (BFS) and HBB roads were considered for improvement with CC or reinforced cement concrete (RCC) pavement where necessary, with modified design standard. In general, the following are the major features of the roads and drains design guidelines: The proposed site is free from flood. However, there are provisions for drains to effectively drain out rain water and household from the secondary drain and discharge to the primary drainage system of the Pourashava. All the drains are considered to provide covers in front of the sensitive receptors or any other location where required.

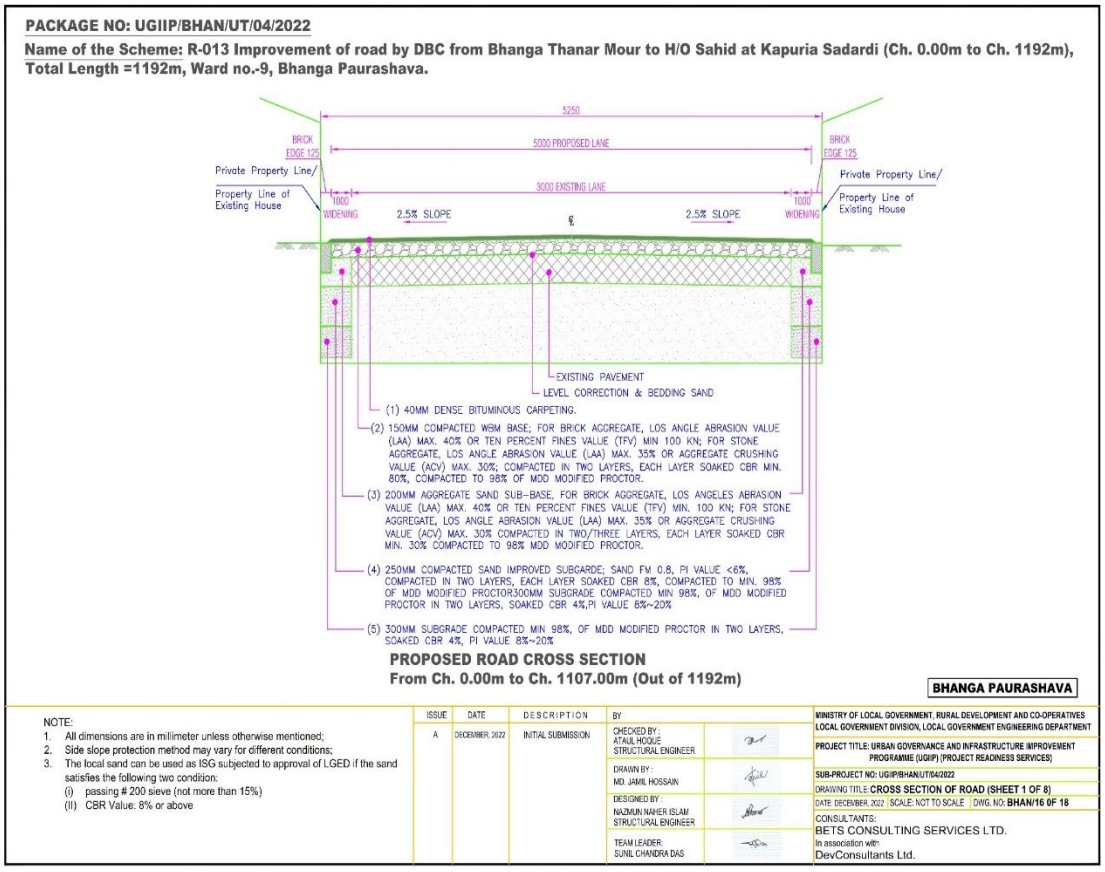


Figure III-3: Cross Section of Road in Bhanga Pourashava

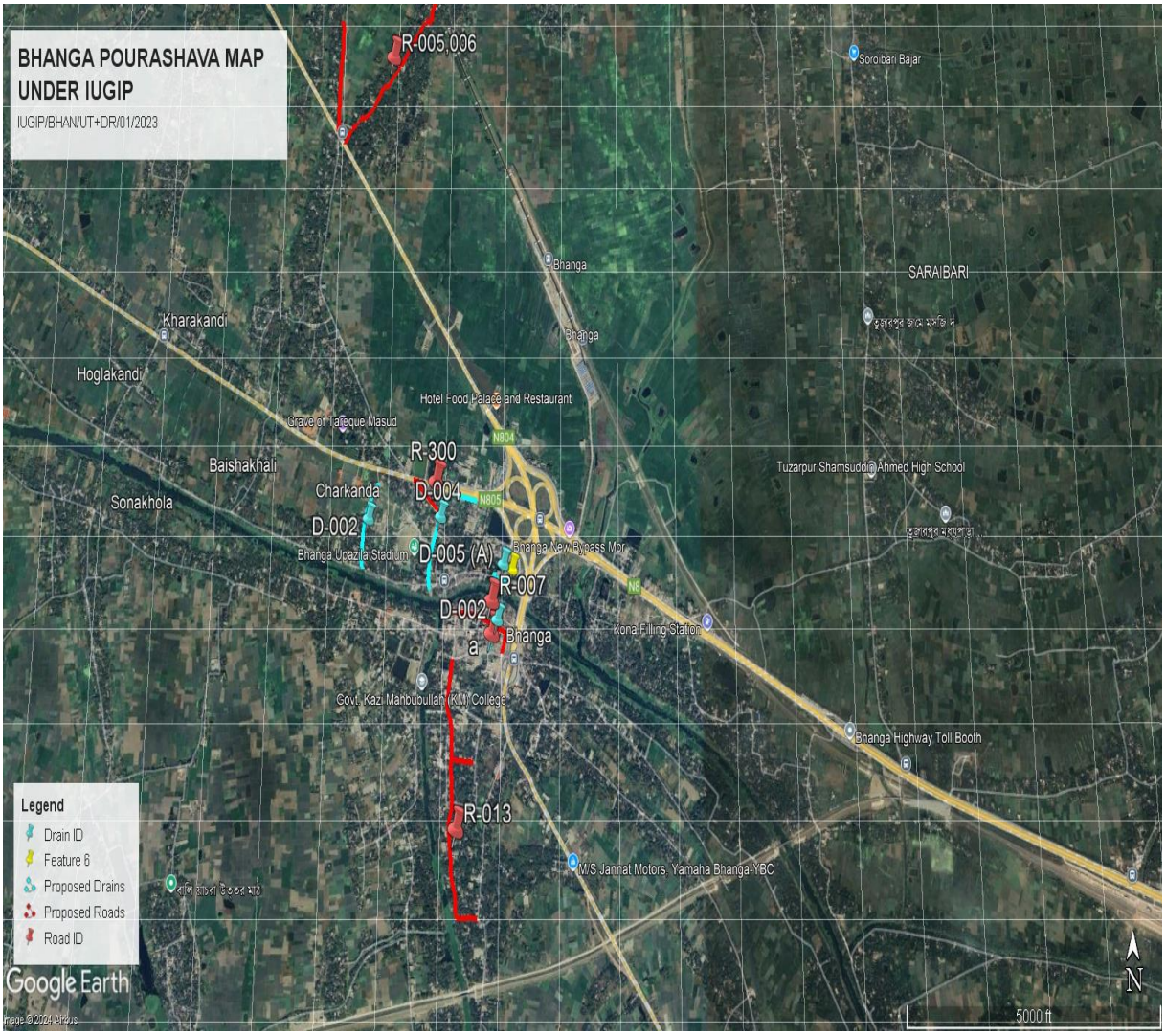


Figure III-4: Location of Roads and Drains at Bhanga Pourashava

c. Implementation Schedule

72. Implementation of IUGIP is split up 18 months or 1.5 years.
    Substantial time is required spanning the continuum of sub-project preparation, approval, survey, design, estimate, contract award and contract execution. Efforts needs to be made to meticulously follow the schedule should a timely implementation of work is aimed at. Usually, the construction work season in Bangladesh runs from October through May (eight months). Construction works are sometimes impeded for the following reasons.
    - Early floods in April/May,
    - Late floods in September/October,
    - Natural calamities (cyclone/tornado, excessive floods) occur in April/May and October/November.

Normally, the best construction period is only for 6 months a year (October to March). The construction period is sometimes squeezed to 4 months due to natural calamities.

73. Summing up, over on 19-months period, implementation schedules are advisable to take between July 2024 and June 2025. A tentative time-schedule for implementation (only as indication) is shown Table-7.

Table III-3: Sub-project Implementation Schedule

Period	From July 2024 to November 2025																											
	2024												2025												2026				
Items of Work	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
Assessment of the Sub-project Supported by MDSC Team in field visit																													
Preparation and approval of Sub-project																													
Compliance of Sub-project and Approval																													
Tendering of Sub-project																													
Evaluation of Sub-project and work order																													
Execution of Physical work																													
Final Inspection and certificate																													

IV. DESCRIPTION OF THE ENVIRONMENT

A. Methodology Used for the Baseline Study

a. Secondary Data

74. Data for this study has been principally collected through comprehensive literature survey, discussion with stakeholder agencies, and field data provided by the Pourashava. The literature survey broadly covered the following:
    - sub-project details, reports, maps, and other documents available with the ADB, MDS consultants, LGED, and Bhanga Pourashava;
    - relevant acts and extraordinary gazettes, and guidelines issued by GoB agencies;
    - literature on land use, soil, geology, hydrology, climate, socio-economic profiles and environmental planning documents collected from GoB agencies and websites.

b. Primary Data

75. Therefore, several visits to the sub-project sites were made by the persons of Pourashava engineering section and supplied to PRSC to assess the existing environment (physical, biological, and socioeconomic) and gather information with regard to the proposed sites and scale of the proposed sub-project. Demographic information, archaeological and religious places, densely populated pockets, and settlements were gathering from PDP and other documents.

c. Data analysis and Interpretation

76. The data collected was analyzed and interpretations made to assess the physical, biological, and socioeconomic features of the project area. The relevant information is presented in the succeeding paragraphs.
77. The IEE including specific description of the environment and corridor of impact has been updated as necessary based on the final detailed design.

B. Physical Characteristics

a. Topography & Geology

78. Bhanga Pourashava is located at Ganges Floodplain (Figure IV.1). According to Master Plan, the lowest spot height of the Pourashava is 1.00m PWD and the highest spot height is 9.66m PWD. Around 80% of the spot heights are between 4m to 8m and average height of land of the area is 5.7 m PWD. A sharp meandering is viewed at the middle of the northern boundary and produces V-shaped topography on the Ward No. 03, 06 and 07. The land elevation of those Wards varies within 0.5 meter to 6 meter. Steep slope (about 80° angle) of the side wall of the river adjacent with the Wards No. 03 and 07 are prominent. Alignment of khals and natural channels are in somewhere 1 meter to 2 meter high than the normal river water. The lowest land elevation is in Ward No. 07 and highest elevation in Ward No.04. Soil of this

region is mainly formed by the very young Ganges meander flood plain and the mixed young and the older Ganges meander flood plain. The northern and eastern parts of the Zila are covered by grey silty clay of the active and very young Ganges meander flood plain. Central and southern parts of the is mainly formed of brown silty clay of the mixed young and the older Ganges flood plan. Northern part of the region is less productive and is mainly used for Aus paddy. The sub-soils are being eroded naturally and the soil varies from place to place and composed of clay to fine sand from 0-40 ft depth, fine sand to very fine sand 40-160 ft, fine sand to medium sand 160-260 ft. The Medium sand to coarse sand is available from 260 ft to 380 ft depth and in rest of the depth are hard clay, fine sand and coarse sand formed entirely by the deltaic action of the Ganges, which brought mud and limestone from Himalayas. To a great extent, soil of the Pourashava is uniform in character. Only variation observed is in greater or smaller admixture of sand, silt and clay in greyish and dark grey colours.

b. Climatic Conditions

79. The climate regime of the area is that of Faridpur, cool and dry winter of December-February is followed by hot and showery pre-monsoon period of March-May and then a relatively cooler but very wet monsoon season prevails during June-September. Again, a transitional humid and showery period follows up to the beginning of winter. From mid-November the weather begins to be dry and relatively cool. Average maximum temperature varies between 24.5°C and 36.3°C and minimum temperature varies between 12.1°C (January) and 25.9°C (August). The Bhanga Pourashava has on an average, normal rainfall 325.4 mm in the month of June which is highest among all other months. In September, it falls to 232.5 mm; again, falling to 142.8 mm in October. From November to March, this rainfall varies between 6.0 mm to 45.2 mm. Winds are stronger in summer in the months of April and May (3 to 6.5 knots) than in winter in the month of November and December (1.5 to 3.0 knots).
80. The effects of climate change are already well visible by increasing air temperatures, melting glaciers and decreasing polar ice caps, rising sea levels, increasing desertification, as well as by more frequent extreme weather events such as heat waves, droughts, floods and storms. Climate change is not globally uniform and affects some regions more than others. On the following diagrams, you can see how climate change has already affected the region of Bhanga during the past 40 years. The data source used is ERA5, the fifth generation ECMWF atmospheric reanalysis of the global climate, covering the time range from 1979 to 2021, with a spatial resolution of 30 km.
81. The data will not show conditions at an exact location. Micro-climates and local differences will not appear. Therefore, temperatures will be often higher than those displayed especially in cities and precipitation may vary locally, depending on topography.

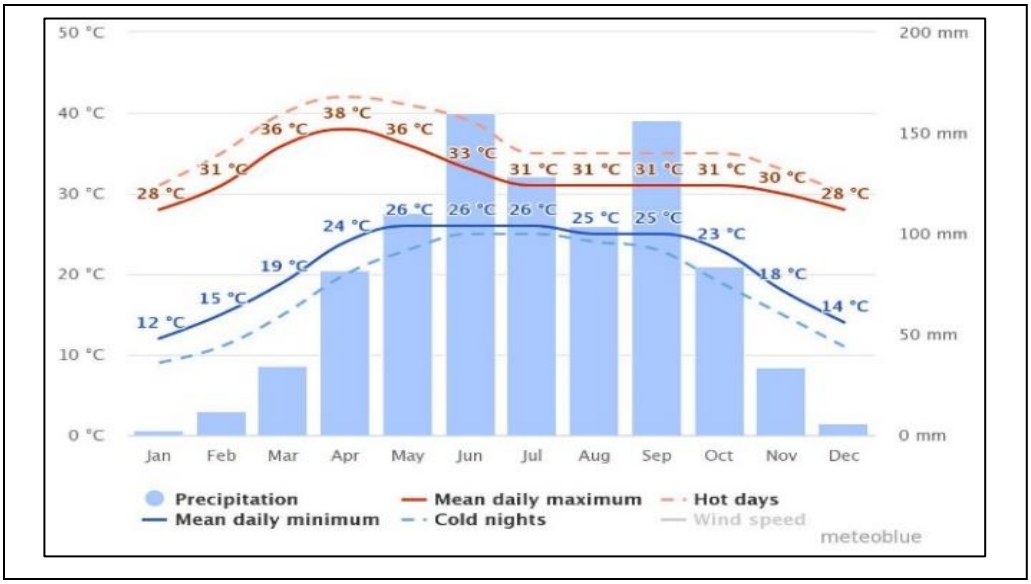


Figure IV-1: Average Temperature and Precipitation*

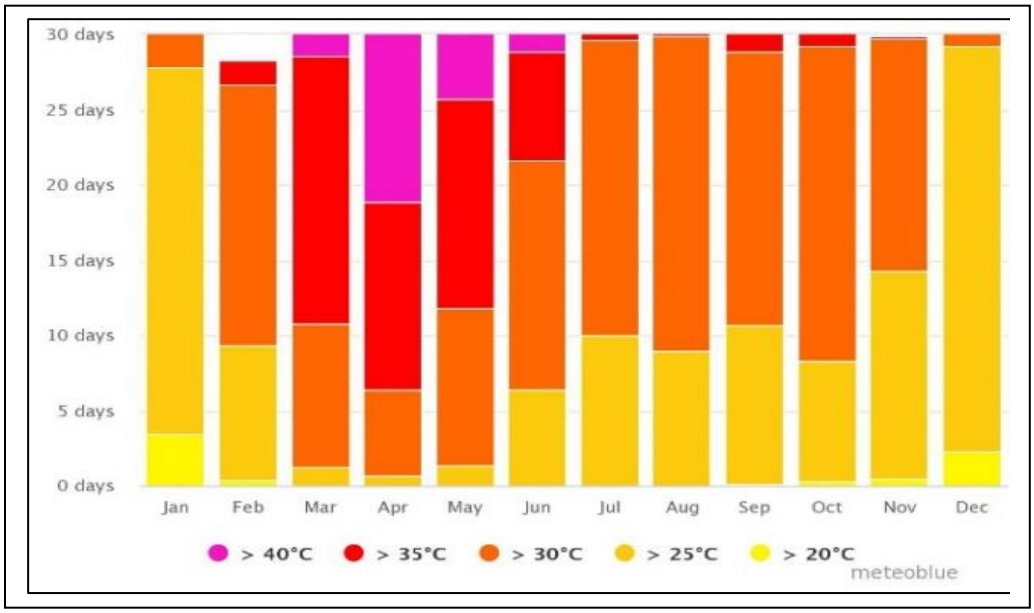


Figure IV-2: Maximum Temperature*

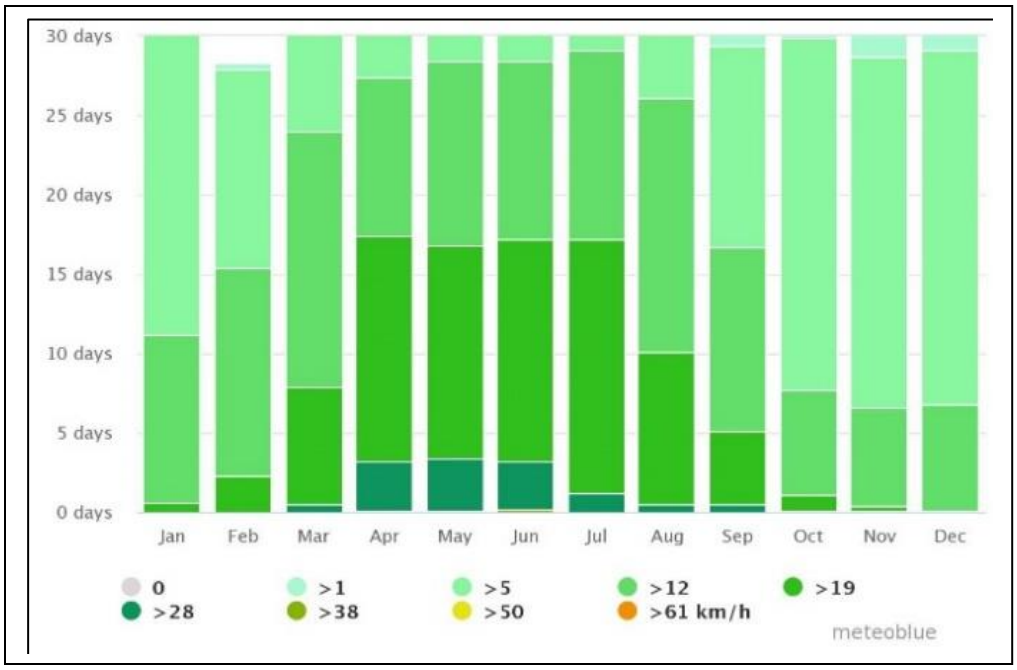


Figure IV-3: Wind Speed*

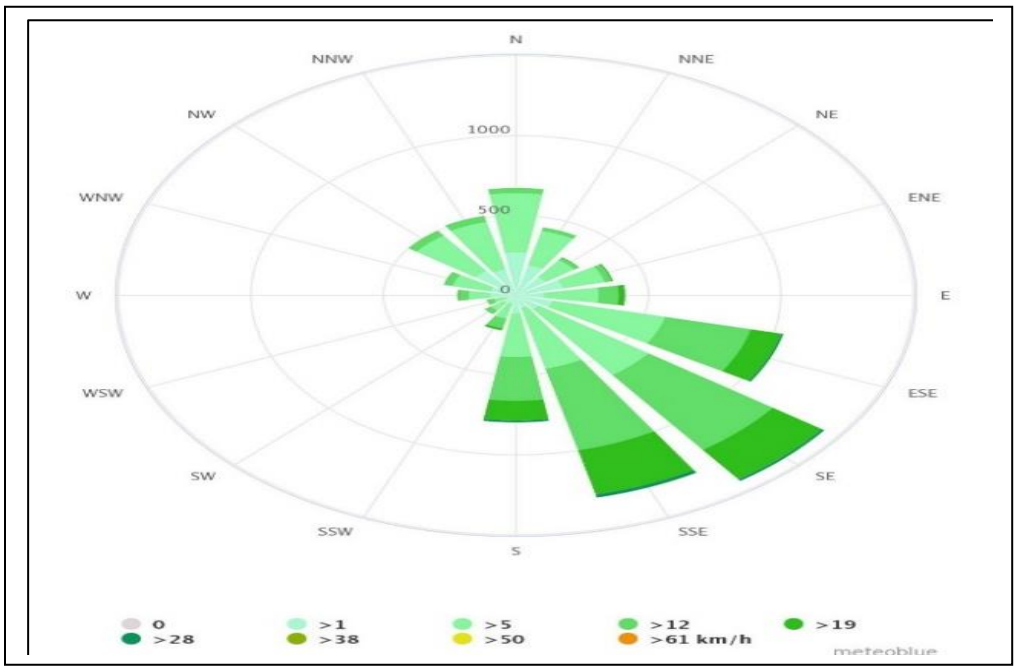


Figure IV-4: Wind Rose*

*Source: http://www.meteoblue.com

Surface Water

82. The main rivers flowing through the region are the Padma, the Jamuna, the Garai and the Kumar whereas the Kumar River flows through the Pourashava. The Padma and the Jamuna are navigable throughout the year. These rivers are non-tidal. In Soil formation of the study area is influenced by its river system through sedimentation. Upper layer of the soil is mainly clay, silty and alluvial type. Those soils are being eroded daily in the eastern and southeastern part of the Pourashava. The Kumar River sides are erosion prone caused by seepage of water from countryside towards the river along the banks during post-monsoon period and during high flood period. Water waves created during the storm surge, cyclone and heavy rainfall are causes of erosion. The seepage of water may create unbalanced pore pressure producing severe bank scouring in loose sandy riverbank resulting river erosion. River, Canal/Khal and pond are the hydrological components of the Pourashava. Those components are occupying 6.97% (289.85 acres) land of the Pourashava. The canals are linked with the adjacent Kumar River. In dry season, most of those canals are using as agriculture land and in the rainy season they submerge lowlands of the Pourashava. The ponds are located around the Pourashava. Small numbers of them are larger than one acre. In dry season, ponds water is using for bathing and washing purposes. Canal water generally uses for irrigation purposes. There are no mentionable industries located in this Pourashava, therefore there is no scopes of industrial wastes mix with water and create water pollution. The Pourashava have a few numbers of drains that are not sufficient to serve the whole area. In Ward No. 06 and 09, the drainage problem that creates water logging as well as water pollution. Bhanga Pourashava has no sufficient number of waste bins and dumping place for garbage management so this creates severe air and water pollution. The fertilizer and chemical uses in the agriculture field for increasing agriculture production are Urea, Potash, Gypsum and Nitrogen Sulphate, Bashudin, Diazinon, Sumithion and Padan. Those chemicals are being contaminated with the surface water and create water pollution. Those chemicals and insecticides are creating water pollution of the Kumar River. Cattle bathing and flow of waste water from domestic use and rain off into the khals and ponds have also identified as reasons for surface water contamination. The area is subject to seasonal flooding. Bhanga Pourashava is a naturally depressed area, which remains submerged during monsoon and dry in winter. Most areas of the municipality are flooded annually. Some places of the road slopes need slope protections works due to existence of low lands beside them. Some necessary precautions have to be taken including construction of water-tolerant infrastructure for development in this area.
83. Ground water quality in the area is influenced by arsenic, manganese and iron. Water in most shallow aquifer is arsenic and all are contaminated with iron, not suitable for drinking purposes. Groundwater pollution due to manganese, iron and hardness is a major problem of the area. With expansion of urban area, more dependency on groundwater sources may increase the pollution level of sub-surface water. The lower deep aquifer has a depth of 220 m to 350 m. Deep aquifers with fresh water in the Pourashava are exploited to meet the demand of water for inhabitants but that is small. Ground water is also being polluted by pesticide leaching from crop field.

Earthquake

84. Bangladesh National Building Code (BNBC) divides the country into four seismic zones with different expected levels of intensity of ground motion. The importance class starts with I and finishes in IV. Zone I is a seismically quiet zone and bask seismic Co-efficient 0.12. This zone covered south western part (Rajshahi, Jessore, Khulna, Barisal) of Bangladesh. Zone II covered Lower middle part, northwest part and the south west Bangladesh where Sundarbans situated seismically less vulnerable than Zone-III, the bask seismic Co-efficient is 0.20. Zone III consists of the regions of higher middle and north western part (Brahmanbaria, Sirajganj and Rangpur) and south eastern part (Chittagong, Cox's Bazar), bask Coefficient for this zone is 0.28. The north eastern folded regions of Bangladesh are the most active zones and belong to Zone IV. The Bask Seismic Coefficient of this zone is 0.36. The distribution of recorded earthquakes indicates a major clustering of seismicity around the Dauki Fault and scattering of other events along other major fault systems of Bangladesh. The magnitude of the earthquake is moderate (4-6) and majority of them are shallow depth. The north-eastern part of Bangladesh is in the most active seismic zone and has experienced earthquakes of moderate to high intensity. Bhanga Pourashava is located in seismic Zone II, referred to as relatively less vulnerable (Figure IV.3) for earthquake in the country. Seismic events in Bangladesh are relatively infrequent, but historically, have been severe, such as the earthquakes of 1930, 1950 & 2004. To address any potential impacts due to seismic activities, provisions of the BNBC 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.

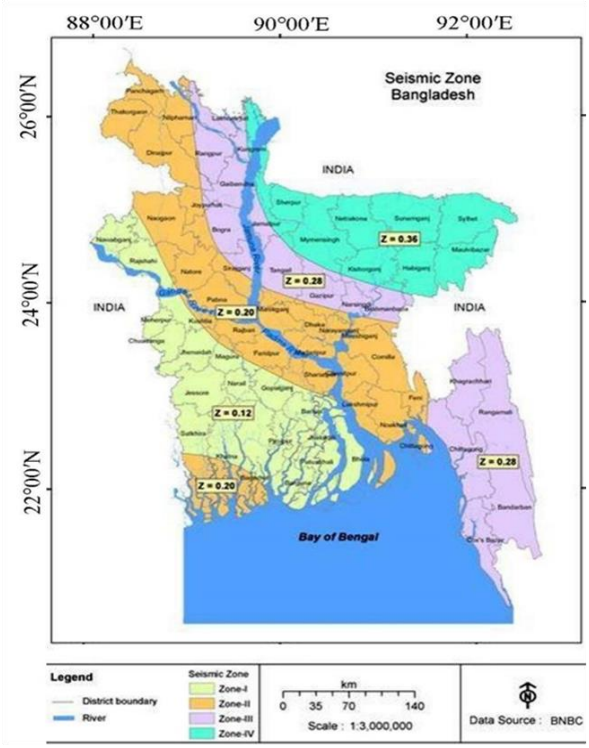


Figure IV-5: Seismic Zones of Bangladesh (4 Zones) [Source: BNBC]

Air Quality

85. Air pollution is the introduction of chemicals, particulate matter, or biological materials that cause harm or discomfort to humans or other living organisms, or damages the natural environment, into the atmosphere. Other than normal, there are no undue air emission sources at the construction site except for limited vehicular emissions from inter-Pourashava traffic that are occasional. Operations of shallow engine driven vehicles that are unfriendly to the environment are responsible for air pollution. Those vehicles use diesel as fuel. Diesel particulate matter (DPM) includes diesel soot and aerosols such as ash particulates, metallic abrasion particles, sulfates, and silicates. The small size inhaled particles may easily penetrate deep into the lungs with acute short-term symptoms such as headache, dizziness, lightheadedness, nausea, coughing, difficult or labored breathing, tightness of chest, and irritation of the eyes and nose and throat. Long-term exposures can lead to chronic, more serious health problems such as cardiovascular disease, cardiopulmonary disease, and lung cancer. Small industrial establishment are found in the Pourashava premises. Those establishments are releasing different types of effluent into the air and polluting the surroundings. Air pollution also occurs by the odor from the open municipal garbage. There are dustbins in the Pourashava but people are not aware to dispose their solid garbage in to those dustbins rather than open ground. This has an impact on agriculture, forestry and natural ecosystems. Here quality of air appears to be clean but due to poor condition of road surface, dust is generated, especially during the movement of vehicles that causes air pollution. As such only the fuel operated vehicles and non-point sources such as open burning is the main source of air pollution. From the public consultation, it is reported from the local people that main air pollution occurs in the residential area is form the household west dump here and there. Lack of proper solid west dumping facilities is the main source of air pollution and bad smell. There are rice mills, saw mills and furniture manufacturing shops in the Pourashava. Saw mills release wooden dust as effluent into the air and polluting the surroundings. The rice husking mills used to boil them before husking. The mills use wood, rice husks or sawdust as fuel in boiling burners. Smoke and hot gases releasing through chimney create massive air pollution. During husking time, the mills release dust husks into the air and polluting the nearby environment. Above all, the Pourashava is almost free from air pollution. Other than normal, there are no undue air emission sources at the construction site except for limited vehicular emissions from inter-Pourashava traffic that are occasional. The baseline air quality will be measured by the sub-project contractors prior to commencement of work. The results will be provided in the updated IEE and all other measurements during implementation will be reported as part of EMP implementation.

Acoustic Environment

86. Noise pollution is basically consisting of unpleasant displeasing human, animal or machine created sound that disrupts the activity or balance of human or animal life. A common form of noise pollution is from transportation, principally motor vehicles. Other sources are car alarms, office equipment, factory machinery, construction work, audio entertainment systems, loudspeakers and noisy people. In the Pourashava, shallow engine driven vehicles are playing on roads as a mean of local transport. They are making lots of trips throughout the Pourashava in a day. Engine generated sounds in their operational time on roads is a matter of nuisance as well as a source of noise pollution. The Pourashava authority has already noticed them to restrict their movements. Generated sounds from industry at their operational time are also a

source of sound pollution existing in the Pourashava. Noise is not a major impediment for the quality of the environment in the Pourashava area. Vehicles such as motor cycle, tempo, mini truck, votvoti, and tractor trailer etc. move on the road during day and night. These vehicles generate noise in the sub-project area but within tolerable limit in most cases. No other perceptible sources of noise generation such as factories, industries, etc. are found near by the sub-project area. The baseline noise level will be measured by the sub-project contractors prior to commencement of work. The results will be provided in the updated IEE and all other measurements during implementation will be reported as part of EMP implementation.

C. Biological Characteristics

a. Ecological Resources

87. **Bio-ecological Zones:** Within a relatively small geographic boundary, Bangladesh enjoys a diverse array of ecosystems. Being a low-lying deltaic country, seasonal variation in water availability is the major factor, which generates different ecological scenarios of Bangladesh. Bangladesh has been classified into 25 broad bio-ecological zones. The project area falls within the broader context of the Barind Tract geological classification of Bangladesh. The ecosystems of Bangladesh could be categorized into two major groups, i.e. (i) Terrestrial and (ii) aquatic

88.

b. Terrestrial Ecosystem

89. **Terrestrial Flora.** The ecological setting is mostly settled countryside with typical homestead and roadside vegetation. There are no extensive forested areas in the near vicinity, yet tree cover from cultivated species could be as high as 50% in some areas. There is no natural forest located alongside any of the subproject road of the Pourashava. Only roadside trees are found which are largely maintained by the community or social forestry program. Main crops grown inside the subproject area include paddy, jute, peanut, onion, garlic, chili and other vegetables.

90. **Terrestrial Fauna.** The diversified habitat and ecosystem in the proposed area support various types of local birds and animals. Magpie Robin, the national bird of Bangladesh, which is commonly known as “Doyel”, is frequently found in the subproject area. The wildlife like frogs, toad, snakes, lizards, tortoise, jackals, rats, shrew, squirrel and bats are common in Bhanga Pourashava area. No rare and endangered species of flora and fauna have been reported in the subproject area. No wild animals inhabit the area. The Most common most common Terrestrial Flora and Fauna of Bhanga Pourashava area is displayed in the following table:

Category	Scientific name	Common Name	IUCN Status	Availability Status
Flora	*Azadirachta indica*	Neem	Least Concern	Fairly common
Flora	*Mangifera indica*	Mango	Not Evaluated	Common
Flora	*Artocarpus heterophyllus*	*Jack fruit*	Not Evaluated	Common
Flora	*Citrus limon*	Lemon	Not Evaluated	Common
Flora	*Borassus flabellifer*	Palm	Not Evaluated	Fairly common
Flora	*Cocos nucifera*	Coconut	Not Evaluated	Fairly common
Flora	*Syzygium cumini*	Blackberry	Not Evaluated	Common

Flora	*Litchi chinensis*	Litchi	Not Evaluated	Fairly common
Flora	*Musa paradiciaca*	Banana	Data Deficient	Common
Fauna	*Hemidactylus frenatus*	lizards	Data Deficient	Common
Fauna	*Serpentes*	Snakes	Data Deficient	Fairly common
Fauna	*Canis aureus*	Jackle	Endangered	Fairly common
Fauna	*Anura*	Frog	Endangered	Fairly common
Fauna	*Herpestidae*	Mongoose	Endangered	Fairly common
Fauna	*Callosciurus erythraeus*	Squirrel	Endangered	Fairly common
Fauna	*Chiroptera*	Bat	Endangered	Rare
Fauna	*Copsychus saularis*	Doyel	Data Deficient	Fairly common
Fauna	*Spilopelia chinensis*	Ghu Ghu	Data Deficient	Fairly common
Fauna	*Corvus*	Crow	Data Deficient	Fairly common

[2]

c. Aquatic Ecology

91. **Aquatic flora.** Different types of aquatic flora species were recorded in the study areas. These are found in canals and ponds in the area and grow abundantly during monsoon season or when these canals and ponds are filled with rainwater. The most abundant hydrophytes in the project area are Kochuripana *(Eichhorniacrassipes),* Topapana *(Pistia stratiotes),* Khudipana *(Lemna minor)* PataJhajii *(Vallisneria spiralis),* Shapla *(Nymphaea sp.),* Kolmi *(Ipomoea aquatica),* Helenchaa *(Enhydra fluctuant),* and Duckweed *(Spiredella* sp.). Numerous algae (e.g. *Spirogyra* and *Scytonema)* and amphibian plant, Dholkolmi (Ipomoea*fistulosa)* are also found in the roadside water bodies. There are no endangered aquatic flora species found in water bodies in the subproject areas.
92. **Aquatic Fauna.** The temporary aquatic habitat of the khals and beels have usual acquatic plants and weeds and the fauna include fishes and crustaceans. The common fish species includes carps (*rui, katla, mrigal, silver carp, grass carp, karpio etc.), barbs (putis), Chitol, Folai, catfish (Tengra, Singi, Magur, Boal, Pungus,* Snakehead (*Shol, Taki*), bele, etc. In addition, varieties of prawn (*chingri*). The fisheries in the proposed project area comprises of ponds, beels, rivers, flood lands, borrow pits, and canals. The Most common most common Aquatic Flora and Fauna of Chapai Nawabganj Sadar is displayed in the following table:

Category	Species	Common Name	IUCN Status	Availability Status
Flora	*Eichhornia crassipes*	Water Hyacinth	Least Concern	Common
Flora	*Nymphaea nouchali*	Blue Water Lily	Not Evaluated	Common
Flora	*Enydra fluctuans*	Helencha	Least Concern	Fairly common
Flora	*Nymphaea nouchali*	Shapla	Not Evaluated	Common

[2] Ali Reza, Barua, et. Al. 2002. Bio-ecological Zones of Bangladesh. Published by the International Union for the Conservation of Nature (IUCN) - Bangladesh.

Flora	*Ipomoea aquatica*	Kolmi	Not Evaluated	Common
Fauna	*Labeo rohita*	Rohu	Least Concern	Common
Fauna	*Wallago attu*	Boal Fish	Data Deficient	Fairly common
Fauna	*Channa striata*	Snakehead	Data Deficient	Fairly common
Fauna	*Siluriformes*	Catfish	Data Deficient	Fairly common
Fauna	*Abelmoschus manihot*	Bele	Data Deficient	Fairly common
Fauna	*Pangasius pangasius*	Pangas	Data Deficient	Common
Fauna	*Puntius stigma*	Punti	Data Deficient	Fairly common

Source: Community People and Dhaka University

d. Agriculture, Tourism and Fishery

93. It is noteworthy to point out here that there are no environmentally sensitive protected forests, wetlands, mangroves, or estuaries in or near the sub-project Area.

D. Socioeconomic Characteristics

a. Population

94. According to the Census Year 2011, 29679 populations are living in the Bhanga Pourashava with 15401 male and 14278 female with gross density 13.3 persons per acre and it will be 50593 in 2031 with gross density 19.75 persons per acre. In the Pourashava, highest concentration of population is in the Ward No. 05 but highest density is in the Ward No. 02. Most of those concentrations are involved with the residential development. Lowest density of population is found in the Ward No. 03 and it reflects that the Ward is being developed as administrative and commercial center.

b. Literacy Rate

95. A large number of household heads are illiterate (39% in Ward No. 07, 38% in Ward No. 01, 30% in Ward No. 02, etc.). No illiterate people in the Ward No. 04 and minor in Ward No. 08 (2%). Reading between Classes-I to V is the highest educational achievement in the Pourashava (35%). SSC level (10%), HSC (5%) and Graduate (5%) is quite low. A large percentage of population in the area is secondary level (25%) education. There are few master's degree holders (1%) and they are found only in the Ward No. 03 (9%), 05 (2%) and 06 (4%). The Pourashava is well developed with number of educational institutions like college, high school and primary school for improvement of educational activities. The students who like to develop him with higher education shifts to the Dhaka or Zila Headquarters, but general educational services are available in the Pourashava premises. Three colleges and two non-government high schools are showing the demand of higher education. Six government primary schools and four kindergartens are identifying the demand of modern educational activities with roots. Total area under this use is 19.70 acres or 0.80% of the area wherein Ward No. 04 and 03 accounts 5.90 acres and 4.40 acres respectively. Ward No. 06 conceived minimum land use under educational facilities (0.30 acres).

96. The Pourashava is mostly linear in shape. Dhaka-Barisal via Bhanga and Dhaka-Khulna via Bhanga National highways passes through the middle of the Pourashava from southeast to northwest. No terminal facility exists in the Pourashava. Buses and trucks as well as other vehicles generally park on adjacent roads. One bus stand is found on the Bhanga intersection, known as Bhanga Bus Stand. Bhanga intersection bus stand is a nationally known bus stand, but all vehicles park on highways. Besides this all the major intersections are the places where local passenger carrying vehicles await on roads with some stoppage time. No waterway is available in the Pourashava. There are altogether 15 bridges (RCC) and 27 culverts (RCC) in the Pourashava (Master Plan 2011-2031). Those bridges and culverts are located on the river and major canals. The National Highways run through the Pourashava and links a number of Connector Roads and Access Roads. National Highways are the major arterial roads of the Pourashava area. It provides connection with Bhanga Pourashava and other 17 districts. There is one important road intersection named Bhanga Bus Stand providing linkages with other access roads. Those access roads are Bhanga Bus Stand to Nurpur, Bhanga Bus Stand to Siladhar Char, Bhanga Bus Stand to Eidgah and Bhanga Bus Stand to Roypara. Motorized and non-motorized vehicles are operated in all the nodes of the study area. The non-motorized vehicles are mainly operated within short distance and meet the local needs. The motorized vehicles are mostly Nosimon and trucks; mainly carry agro-product from the Bhanga Bazar towards Bhanga Bus Stand and Dhaka. Locally modified motorized transport vehicle named Nosimon also uses for short distance passenger and goods transportation. No railway facility is in the Pourashava.
97. Physical growth of Bhanga Pourashava town generally depends on the road pattern of the Pourashava. Bhanga Pourashava is connected with Dhaka Road and Faridpur Road. So, linear development is the common feature of the Pourashava. The Bhanga Bus Stand is another important center, which influences the dwellers to shift towards this bus stand. There is a great scope of physical growth in Ward No. 4 towards the Dhaka Road due to small business. An intersection named Bhanga Intersection penetrates the Bhanga Pourashava. Vehicular movement about 17 districts pass this intersection. Development trend of the Bhanga was followed the river bank and as a result Ward No. 01, 03 and 04 have been developed linearly following the riverbank. Two National Highways passes through the Bhanga Pourashava and both the sides of the highway is occupied by huge tracts of agriculture land and sporadic homesteads, at places showing the signs of development along with the hats, bazars indicating the dominant role of agriculture and fishery. This indicates general feature of the area as a mixture of rural and semi-urban nature. Business (small business 26% and large business 16%) is the dominant occupation of the household heads in the Pourashava. Farming or agriculture (25%) is the second dominant occupation. Agriculture or farming includes crops, livestock and poultry and fish farming. Apart from this there are other occupations like public or private service, informal sector work, rickshaw/van puller, teaching, skilled and unskilled labor, handicrafts, etc. The scenario reveals that 10% as office workers both government and semi-government including employees in private offices. The transportation workers comprising rickshaw and van pullers accounts for 8% of the total occupation group in the study area. In the Pourashava, small business is the dominant occupation in three Wards (Ward No. 02, 08 and 09). Farming/agricultural domination is in four Wards (Ward No. 01, 03,0 6 and 07). Pourashava has numerous occupational groups who are helping the economic base to be sustained. Being predominantly in an agricultural region, the inhabitants of Pourashava are changing their major occupational involvement from agriculture to business. It is apprehended that with the increasing urbanization, there will be

increasing number of people taking non-farm occupations as their primary occupation. This will happen as a social process of deprivation in rural area leading to increased pauperization and forcing large number of people into urban centres as destitute who would have no option but to engage them in urban occupations.

c. Historical, Cultural and Archaeological Characteristics

98. Nothing is definitely known about the origin of the name. It is learnt that, in the past, the police station was established in Kumarganj Bazar. This Kumarganj Bazar was frequently shifted from one place to another by the local Zamindars due to river erosion. In consequence of repeated breaking (meaning Bhanga in Bengali) the name of this Bazar along with the name of the Thana was changed into Bhanga. There are no historical, cultural and archaeological infrastructure in or near the sub-project area which might be impacted due to the construction activities. Ward No. 04 is dominating areas for cultural facilities in the Pourashava. In total, 10 clubs are in the Pourashava. Those clubs are the local cultural centres, sometimes also use for political purposes.

E. Baseline and Project Climate

- For roads, the critical climate parameter is precipitation in terms of volume and intensity, and their impact on occurrences of flooding depending on location. In combination with geology and geography, a related variable is soil moisture as it affects road foundation stability.
- Hot days temperature is also an important road design consideration, particularly for asphalt roads, due to its effect on stiffness of the pavement. The stiffness modulus of asphalt is affected by temperature. Migration/bleeding of liquid asphalt is a concern at sustained air temperatures above32°C.For concrete roads, the range of temperature variation determines the proper width of joints, including the composition of the joint sealants.
- For bridges, the critical design parameter derived from precipitation and catchment characteristics is flood level, which determines the required vertical clearance of the bridge deck.
- It is to mention that the changes, in projected monthly temperature and precipitation, when presented in comparison to the historical mean, will help the engineers, planners and designers to design projects more effectively with precision.

V. ANTICIPATED ENVIRONMENTAL IMPACT AND MITIGATION MEASURES

A. Impact Assessment Methodology

99. Issues for consideration have been raised by the following means: (i) input from interested and affected parties; (ii) desktop research of information relevant to the proposed subproject; (iii) site visits; and (iv) evaluation of proposed design scope as per MDSC study and potential impacts.

100. The corridors of impact considered include: (i) existing alignment and width of roads to be rehabilitated; and (ii) existing RoWs. No additional land is required beyond the RoWs. Categorization of the subproject and formulation of mitigation measures have been guided by field visit findings for road and drain improvement and ADB SPS, 2009.

B. Anticipated Impacts and Mitigation Measures

a. Planning and Design Phase

101. Planning principles and detail design considerations have been reviewed and incorporated into the site planning process. Location for the sub-project components will be on properties held by the Pourashava. Access to the sub-project site is through public existing roads.

- **Sub-project Selection Criteria**

102. The project environmental assessment and review framework specifies environmental criteria to avoid or minimize adverse impacts during the identification and finalization of road & drain improvement sub-project. Table V.1 summarizes site and design considerations as per final design.

Table IV-1: Site and Design Considerations to Meet EARF Environmental Criteria

Sl. No.	Components	Environmental Selection Guidelines	Remarks
1.	Overall selection guideline	▪ Comply with all requirements of relevant national and local laws, rules and guidelines.	▪ Requisite LCC and ECC to be obtained prior to commencement of works
		▪ Avoid/minimize where possible locations in protected areas, including notified reserved forests or biodiversity conservation hotspots (wetlands, national reserves, forest reserves and sanctuaries).	▪ Not present in Pourashava area.
		▪ Avoid possible locations that will result in destruction/disturbance to historical and cultural places/values.	▪ Use of "chance find" procedures in the EMP that include a pre-approved management and conservation approach for materials that may be discovered during project implementation.
		▪ Avoid tree cutting where possible. Retain mature roadside trees that are important/valuable or historically significant. If any trees have to be removed, plant two new trees for every one that is lost.	▪ Permit for tree-cutting to be obtained by contractor/s prior to commencement of work ▪ Compensatory plantation for trees lost at a rate of 2 trees for every tree cut, in addition to tree plantation as specified in the design, will be implemented by the contractor, who will also maintain the saplings for the duration of his contract.
		▪ Ensure all planning and design interventions and decisions are made in consultation with local communities and include women. Reflect inputs from public consultation and disclosure for site selection.	▪ All consultations during project preparation are documented and concerns expressed by public addressed in the IEE.
		▪ Synchronize the road & drain and associated works (to extent possible) to minimize disturbance and optimize use of resources (e.g., water pipes laid prior to road improvements).	▪ Included in the design and EMP

Sl. No.	Components	Environmental Selection Guidelines	Remarks
2.	Road and Drain improvement/ Rehabilitation/Maintenance	▪ Ensure tree planting alongside roads to provide a natural barrier to noise and visual impacts, and include additional man-made barriers where suitable for public safety.	▪ Included in the design and EMP
		▪ ensure the provision of new or improved household, storm water drainage to remove the increased runoff caused by increasing the road surface area	▪ Included in the design and EMP
		▪ Ensure construction of road and drain will be on a Pourashava owned land or after completion of land acquisition if required.	▪ Proposed existing network is located at the Pourashava owned land.
		▪ Avoid eviction of any structures or commercial activities within the sub-project area, if required adopt appropriate procedure.	▪ The proposed site is on developed previously non-agricultural low land. No structure was there.
		▪ Avoid any ecological sensitive area and impact on wildlife, or rare and endangered species.	▪ Proposed site is not situated near any ecological sensitive area and no impact on wildlife or rare and endangered species.

Table IV-2: Actions to Mitigate Climate Change Impacts & Improve Climate Resilience

Sl. No.		Mitigation Measures
A.	**Climate change effect**	
1.	Increased rainfall quantity and runoff Increased frequency of storms	▪ Improve O & M, organizational capacity, resource allocation, etc. ▪ Work with relevant stakeholders to manage water use and flood discharges more effectively ▪ Improve collection and disposal of waste ▪ Control encroachments ▪ Improve public behaviour through active and prolonged information, education, and communication campaigns to reduce uncontrolled solid waste disposal, encroachments, damage to infrastructure, unregulated development in key areas, etc., supported by enforcement. ▪ Guide wall to protect erosion and sliding for roads with adjacent water bodies/ponds
B.	**Impact Factor**	
1.	Construction materials' quality	▪ Choose most durable materials possible, even if higher cost, e.g., concrete, high quality bricks. ▪ Monitor and control construction quality
2.	Rising temperatures	▪ Execute works during most favourable times of year and day. ▪ Monitor and control preparing, placing, and curing concrete and mortar, to ensure placement, etc., during most favourable times. ▪ Use plain high-quality un-rendered brick work and high-quality cement mortar in preference to rendered low-grade bricks ▪ Use sulphate resisting cement in vulnerable locations (higher heat gain during curing) or cement containing fly ash (less heat gain, so preferred).
3.	Run-off	▪ Use U and trapezoidal section side drains with small low-flow section for low flows ▪ Line side drains to achieve higher discharge velocities without increasing risk of scour, etc. ▪ Considering the effect of climate change the sustainability of sub-project have been increased by 10%. Sizes of infrastructure, where required, have been made large enough to facilitate normal plus additional flow of house-hold, storm water from an increased rainfall due to climate change.

- **Land Acquisition and Resettlement**

103. The proposed sub-project to be constructed in the Pourashava owned land and through the existing roads and drains. There are no encroachers or residential/ commercial structures in the proposed area as per the study of social and resettlement team. In addition, there is no squatters will be disturbed due to the proposed sub-project as per the social and resettlement assessment. Hence, no negative impacts are envisaged due to the sub-project.
104. The concepts considered in design of the road & drain sub-project are: (i) prioritizing rehabilitation/ maintenance over new construction; (ii) locating facilities on government/ Pourashava-owned land to avoid the need for land acquisition; (iii) taking all possible measures in design and selection of sites to avoid resettlement impacts; (iv) avoiding where possible locations that will result in destruction/disturbance to historical and cultural places/values; (v) avoiding tree-cutting where possible; (vi) ensuring all planning and design interventions and decisions are made in consultation with local communities and reflecting inputs from public consultation and disclosure for site selection.

- **Landscape and Existing Utilities**

105. The proposed road and drain are within the existing network. The proposed sub-project will be also constructed/rehabilitation/maintenance within existing network. Therefore, investigation before construction and formulation of plan of restoration of existing utilities within shortest time is recommended. The plan must be formulated with coordination with PIU, contractor and the field level construction supervisor. The plan must be shared with the PIU/ MDSC and approved by them.

i. Obtaining NOC

106. Failure to obtain necessary consents, permits, NOC's can result in design revisions and/or stoppage of the works. All the sites have own land available to the Pourashava. Therefore, the Contractor will not have any obstacle to start the construction without any delay. Moreover, an ECC is already obtained from the DoE against the UGIIP.

ii. EMP Implementation Training

107. Often lack of proper training to implement the EMP stipulated in the 'Bid Document' leads to mismanaged environmental safeguards. Therefore, EMP training for the contractors, workers and implementing agency is necessary before construction goes on-board. A training needs to be arranged before construction starts with all involved parties: contractor, workers and representatives from Implementing Agency to implement the EMP and therefore is necessary.

b. Construction Phase

108. In the case of this sub-project (i) most of the individual elements are relatively small and involve straightforward construction, so impacts will be mainly localized and not greatly significant; (ii) most of the predicted impacts are associated with the construction process and are produced because that process is invasive, involving excavation and earth movements; and (iii) being located in the built-up area of the Pourashava, will not cause direct impact on biodiversity values.

109. Although construction of these project components involves quite simple techniques of civil work, the invasive nature of excavation and the sub-project sites in built-up areas of Bhanga Pourashava where there are a variety of human activities, will result to impacts to the environment and sensitive receptors such as residents, businesses and the community in general. These anticipated impacts are short-term, site-specific and within a relatively small area. There are no impacts that are significant or complex in nature, or that need an in-depth study to assess the impact. Thus, Bhanga Pourashava Road and drain improvement sub-project is unlikely to cause significant adverse impacts.

- **Construction Method**

110. Tasks to be performed for construction of road and drain are: (i) site clearing; (ii) laying of base, sub-base, sub-grade, track coat, prime coat, sill coat etc.; (iii) road end edging; (iv) construction of drainage slope; (v) construction of drain cover slab; (vi) architectural components and finishes; and (vii) ordering, procurement and installation of building services. Excavation for the foundation will be dug by backhoe digger, supplemented by manual digging where necessary. Excavated soil will be placed nearby, and the materials (brought to site on trucks and stored on unused land nearby) will be placed by crane or using a small rig. The infrastructures will be constructed manually according to design specifications. Any excess materials will be disposed to pre-approved disposal sites.
111. There is sufficient space for a staging area, construction equipment and stockpiling of materials. However, the contractor will need to remove all construction and demolition wastes on a daily basis. The debris accumulated from the demolition of the existing old structure at site will be stored in a safe place in the Pourashava own compound.

- **Worker Camps**

112. To accommodate the needs of the workforce, the contractor should provide suitable housing, adequate supplies of potable water, and toilet and bathing facilities within the housing area. Onsite facilities for preparing food need to be provided, or food service contracted. The contractor should provide means for disposing of wastewater from toilets, baths and food preparation areas either through a septic tank or through sock well or holding tank with removal by vacuum truck. Solid waste should be collected at waste bins and disposed of properly offsite. The labor camp should be located at a distance from any nearby community and workers transported daily to the construction sites. Temporary lodging for workers should not be set up along the alignments where piping is being installed. The labor camp should be set up at a selected and approved location for the duration of the contract, and located such that it does not interfere with or cause a nuisance for the local community. Complete closure of the camp is required at the end of the work, including removal of any underground tanks and above-ground structures.

- **Site and Route Maintenance**

113. The contractor should plan haul routes to avoid congested areas and narrow roads, and schedule transportation to avoid peak traffic periods. Speed limits and other traffic rules need to be strictly enforced among drivers. Traffic detours need to be identified and marked in the event they are necessary to maintain traffic flow through the construction zone. Flagmen

need to be posted at the start and finish of construction areas as necessary to direct the movement of traffic. Movable sanitary facilities should be provided at the site and kept clean, free of odors and usable. No materials should be stored onsite for longer than a day before their use. Excess materials should be removed after a segment is complete. The contractor should avoid trenching where damage might occur to buildings, and provide shoring and backfill with sand/cement admixture to prevent caving. The contractor should avoid stockpiling earth and construction materials in areas subject to flooding and flowing water. Loss of fuel oil, engine oil and other types of pollutants to the soil or to drainage courses will not be tolerated.

- **Topography, Landforms, Geology and Soils**

114. Significant amount of gravel, sand, and cement will be required for this sub-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.
115. Utilize readily available sources of materials. If contractor procures materials from existing burrow pits and quarries, ensure these conform to all relevant regulatory requirements. Borrow areas and quarries (If these are being opened up exclusively for the sub-project) must comply with environmental requirements, as applicable. No activity will be allowed until formal agreement is signed between PIU, landowner and contractor.

- **Surface Water Quality**

116. Trenching and excavation, run-off from stockpiled materials, and contamination from fuels and lubricants may result to silt-laden runoff during rainfall that may cause siltation and reduction in the quality of adjacent bodies of water. There are few small ponds/ditches near the road and drain RoW and surface water pollution is expected due to the construction activities. Therefore, the expected impacts are minor negative and short term, site-specific within a relatively small area and reversible by mitigation measures.

i. Prepare and implement a Soils management plan (see **Appendix 8** for outline).
ii. Prioritize re-use of excess Soils and materials in construction activities. If Soils will be disposed, consult with Bhanga local authority on designated disposal areas.
iii. All earthworks must to be conducted during dry season to maximum extent possible to avoid the difficult working conditions that prevail during monsoon season such as problems from runoff.
iv. Location for stockyards for construction materials shall be identified at least 300m away from watercourses.
v. Place storage areas for fuels and lubricants away from any drainage leading to water bodies.
vi. Take all precautions to minimize the wastage of water in the construction activities.
vii. Take all precautions to prevent entering of wastewater into streams, watercourses, or irrigation system. Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies.
viii. Ensure diverting storm water flow during construction shall not lead to inundation and other nuisances in low-lying areas.

ix. While working across or close to any water body, the flow of water must not be obstructed. Ensure no construction materials like earth, stone, or appendage are disposed of in a manner that may block the flow of water of any watercourse and cross drainage channels.
x. Monitor water quality according to the environmental management plan.

- **Groundwater Quality**

117. Increased demand of groundwater is anticipated during the construction phase for construction activities and domestic purposes. Uncontrolled extraction of water may also affect availability of waters to locals. In addition to that, construction waste, if left unattended will result in forming leachate which will percolate through the soil strata and will reach underground water table and hence, will end up contaminating it. Mitigation measures will include:
    i. Pumping of groundwater should be from deep aquifers of more than 300 m to supply arsenic free water. Safe and sustainable discharges are to be ascertained prior to selection of pumps.
    ii. Tube wells will be installed with due regard for the surface environment, protection of groundwater from surface contaminants, and protection of aquifer cross contamination.
    iii. All tube wells, test holes, monitoring wells that are no longer in use or needed shall be properly decommissioned.
    iv. Protect groundwater supplies of adjacent lands.

- **Air Quality & Dust**

118. Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of vehicle-related pollutants (such as COx, SOx, PMs, NOx, and HCs) which will affect people who live and work near the sites. Different activities regarding the machinery movement and other works generate dust and impair the air quality. The impacts are negative but short-term, site- specific within a relatively small area and reversible by mitigation measures.
    i. Damp down exposed soil and any sand stockpiled on site by spraying with water when necessary, during dry weather;
    ii. Use tarpaulins to cover soils, sand and other loose material when transported by trucks.
    iii. Unpaved surfaces used for haulage of materials within settlements shall be maintained dust-free.
    iv. Arrangements to control dust through provision of windscreens, water sprinklers, and dust extraction systems shall be provided at all hot-mix plants, batching plants, and crushers (if these establishments are being set up exclusively for the sub-project).
    v. Water will be sprayed to control the dust, which is the main way to suppress dust in the working site.
    vi. Debris materials should be transported through truck covered by tarpaulin.
    vii. Apply water every 4 hours to the area within 30m of structures being demolished, to reduce vehicle track out.
    viii. Apply water to disturbed soils after demolition is completed or at the end of each day of clean up

ix. Prohibit demolition activities when wind speeds exceed 30 kph.
x. Limit on-site vehicle speeds (on unpaved roads) to 20 kph.
xi. Provide jute made cloth around the structures to be demolished.
xii. Monitor air quality.

- **Acoustic Environment**

119. Construction activities will be far from settlements, far from schools and areas with small-scale businesses. Temporary increase in noise level and vibrations may be caused by excavation equipment and the transportation of equipment, materials, and people. However, the proposed sub-project situated out of core area and impact is short-term, site-specific and within a relatively small area. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.

i. Involve the community in planning the work program so that any particularly noisy or otherwise invasive activities can be scheduled to avoid sensitive times.
ii. Plan activities in consultation with Bhanga local authority so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance.
iii. Use of high noise generating equipment shall be stopped during night time.
iv. Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach;
v. Utilize modern vehicles and machinery with the requisite adaptations to limit noise and exhaust emissions and ensure that these are maintained to manufacturers' specifications at all times.
vi. All vehicles and equipment used in construction shall be fitted with exhaust silencers. Use silent-type generators (if required).
vii. Monitor noise levels. Maintain maximum sound levels not exceeding 85 decibels (dBA) when measured at a distance of 10m or more from the vehicle/s.
viii. 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.
ix. 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.

- **Aesthetics**

120. The construction activities do not anticipate any cutting of trees but will produce excess excavated earth (Soils), excess construction materials, and solid waste such as removed concrete, wood, packaging materials, empty containers, Soils, 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.

i. Prepare a debris disposal plan.
ii. Remove all construction and demolition wastes on a daily basis.
iii. Coordinate with Bhanga local authority for beneficial uses of excess excavated soils or immediately dispose to designated areas. Avoid stockpiling of any excess Soils.

iv. All vehicles delivering fine materials to the site and carrying debris for disposal shall be covered to avoid spillage. All existing roads used by vehicles of the contractor, shall be kept clear of all dust/mud or other extraneous materials dropped by such vehicles.
v. Lighting on construction sites shall be pointed downwards and away from oncoming traffic and nearby houses.
vi. In areas where the visual environment is particularly important or privacy concerns for surrounding buildings exist, the site may require screening. This could be in the form of shade cloth, temporary walls, or other suitable materials prior to the beginning of construction.
vii. The site must be kept clean to minimize the visual impact of the site. Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas.

- **Biodiversity**

121. Activities are being located in the built-up area of Bhanga Pourashava. There are no protected areas in or around sub-project sites, and no known areas of ecological interest. Preliminary design shows there are no trees at the sites that need to be removed.
    i. Check if tree-cutting will be required during detailed design stage. No trees, shrubs, or groundcover may be removed or vegetation stripped without the prior permission of the environment management specialist.
    ii. All efforts shall be made to preserve trees by evaluation of minor design adjustments/ alternatives (as applicable) to save trees.
    iii. Special attention shall be given for protecting giant trees and locally-important trees (with religious importance) during implementation.
    iv. 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 sub-project vicinity.
    v. Prohibit employees from poaching wildlife and cutting of trees for firewood.
    vi. Implement compensatory plantation for trees lost at a rate of 2 trees for every tree cut. Maintain the saplings for the duration of contract.

- **Traffic Congestion**

122. 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.
    i. Follow the traffic management plan given in Appendix 5 of this report.
    ii. Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites.
    iii. Maintain safe passage for vehicles and pedestrians throughout the construction period.
    iv. Schedule truck deliveries of construction materials during periods of low traffic volume.
    v. Erect and maintain barricades, including signs, markings, flags and flagmen informing diversions and alternative routes when required.
    vi. Notify affected sensitive receptors by providing sign boards informing nature and duration of construction activities and contact numbers for concerns/complaints.

vii. Leave spaces for access between mounds of soil.
viii. 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, so that there is no closure of these shops or any loss of client age.
ix. Ensure any damage to properties and utilities will be restored or compensated to pre-work conditions.

- **Socio-economic Status**

123. Work force will be required during the 12-month construction stage. This can result to generation of contractual employment and increase in local revenue. Thus, potential impact is positive and long-term.

i. 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.
ii. Secure construction materials from local market.

- **Existing Amenities for Community Welfare**

124. Although construction of sub-project components involves quite simple techniques of civil work, the invasive nature of excavation and the sub-project sites being in existing networks of Bhanga Pourashava where there are a variety of human activities, will result to impacts to the sensitive receptors such as residents, businesses and the community in general. Excavation may also damage existing infrastructure (such as water distribution pipes, electricity pylons, etc.) located alongside the roads. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.

i. Obtain details from Pourashava nature and location of all existing infrastructure, and plan excavation carefully to avoid any such sites to maximum extent possible;
ii. Integrate construction of the various infrastructure sub-projects to be conducted in Bhanga (road and drain, etc.) so that different infrastructure is located on opposite sides of the road where feasible and roads and inhabitants are not subjected to repeated disturbance by construction in the same area at different times for different purposes.
iii. Consult with local community to inform them of the nature, duration, and likely effects of the construction work, and to identify any local concerns so that these can be addressed.
iv. Ensure any damage to properties and utilities will be restored or compensated to pre-work conditions.

- **Community Health and Safety**

125. The public should be barred from construction areas, and excavations should be barricaded and marked. Paths of access and passage for vehicles and pedestrians should be clearly marked through the work zone. The contractor should minimize use of heavy equipment in congested areas, conduct activities during daylight hours, and apply water to suppress dust as needed. In heavily trafficked areas such as markets, the contractor should increase the work force to complete construction quickly, reduce dust by removal of excess earth, and avoid obstructing the paths of travel for pedestrians and vehicles. The contractor should minimize downtime of existing water supply, limit shutdowns to less than four hours, and notify the public in advance to store water as necessary.

126. Construction works will impede the access of residents and business in limited cases. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.

i. Contractor's activities and movement of staff will be restricted to designated construction areas.
ii. Consult with Bhanga local authority on the designated areas for stockpiling of soils, gravel and other construction materials.
iii. If the contractor chooses to locate the work camp/storage area on private land, he must get prior permission from the environment management specialist and landowner.
iv. Use small mechanical excavators to attain faster trenching progress. Crusher will be used for stone and concrete breaking.
v. Under no circumstances may open areas or the surrounding bushes be used as a toilet facility.
vi. Recycling and the provision of separate waste receptacles for different types of waste shall be encouraged.
vii. 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 facilities); (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.
viii. 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 management specialist's attention immediately; and (iv) taking remedial action as per environment specialist's instruction.
ix. The contractor shall immediately take the necessary remedial action on any compliant/grievance received by him and forward the details of the grievance along with the action taken to the environment management specialist within 48 hours of receipt of such compliant/grievance.

- **Occupational Health and Safety**

127. The Contractor should have a basic safety and health plan in place for workers, in which workers are required to wear personal protective gear suitable to the type of work being performed and a worker is suitably trained (or experienced) in the work he/she is assigned to do. Emergency care should be available on call. The Contractor should maintain a record of accidents, which should be reviewed on occasion with the supervising engineer. The contractor should maintain a high standard of safety in the performance of work. Workers need to be informed of potential risks associated with activities conducted in the vicinity of moving equipment, and workers should not be allowed to enter deep trenches unless they are properly shored.

128. There is invariably a safety risk when construction works such as excavation and earthmoving are conducted in urban areas. Workers need to be mindful of the occupational hazards which can arise from working height and excavation works. Potential impacts are negative and long term but reversible by mitigation measures.

i. Comply with requirements of Government of Bangladesh labor law of 2006 and all applicable laws and standards on workers' health and safety (H&S).
ii. Ensure that all site personnel have a basic level of environmental awareness training.
iii. Procedure and implement a site H&S plan which include measures as: (a) excluding the public from worksites; (b) ensuring all workers are provided with and required to use personal protective equipment (reflectorized vests, footwear, gloves, goggles and masks) at all times; (c) providing (H&S) training for all site personnel; (d) documenting procedures to be followed for all site activities; and (e) maintaining accident reports and records.
iv. Arrange for readily available first aid unit including an adequate supply of sterilized dressing materials and appliances.
v. Maintain necessary living accommodation and ancillary facilities in functional and hygienic manner in work camps. Ensure (a) uncontaminated water for drinking, cooking and washing, (b) clean eating areas where workers are not exposed to hazardous or noxious substances; and (c) sanitation facilities are available at all times.
vi. Provide medical insurance coverage for workers;
vii. Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection and preventing injuring to fellow workers;
viii. Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted;
ix. Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating area;
x. Ensure moving equipment is outfitted with audible back-up alarms;
xi. Mark and provide signboards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to and easily understood by workers, visitors and the general public as appropriate; and

xii. Disallow worker exposure to noise level greater than 85 dBA for duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.

C. Operation & Maintenance Phase

129. In the operations and maintenance (O & M) phase, the road and drain system will operate with routine maintenance, which should not affect the environment. The infrastructures will need to be repaired from time to time, but environmental impacts will be much less than those of the construction period as the work will be infrequent, affecting small areas only. O & M will be the responsibility of Bhanga Pourashava local authority, which will be given training by this sub-project.
130. Routine repairs and maintenance works will be very small in scale, to conducted manually by small teams of men and works will be very short in duration thus will not cause significant physical impacts.

a. Air Quality

131. Air emissions of common air contaminants and fugitive dust may be elevated in proximity to active work sites may include gaseous for disinfection processes. Develop and implement a prevention program that includes identification of potential hazards written operating procedures, training, maintenance, and accident investigation procedures.

b. Acoustic Environment

132. Temporary increase in noise level and vibrations is expected. The impacts are minor negative and long-term, site-specific within a relatively small area reversible by mitigation measures.
133. Plan activities in consultation with Bhanga local authority so that activities with the greatest potential to generate noise are conducted during periods of the day that will result in least disturbance.

c. Surface/Waste Water Quality

134. The surface water bodies may get flooded and polluted due to uncontrolled release of contaminated storm-water/road runoff from road surfaces. The pollutants associated with the road-runoff include, hydrocarbons, heavy, corrosive products and suspended solids including insoluble heavy metals as colloidal materials from traffic. The worst contamination generally takes place during the first flush of runoff from roads after a spell of dry weather. The level of pollution is directly related to the traffic volume. The pollution risk from accidental spillage may increase moderately. In the long run, the increased traffic volume and faster traffic speeds would increase the risk of accidental spillage, which could have medium adverse impact on surface water quality. Since the roads are within the Pourashava and traffic sizes are relatively small and light vehicle thus the overall impact is negligible.
135. The Pourashava needs to clean the drains regularly. The Pourashava management should ensure that only rainwater and household water will fall to the drains. Besides maintenance, the waste water quality has to be tested regularly from the outfall location and mitigation measures should be taken, while it deviates from the national standard.

d. Biodiversity

136. All activities will be in the built-up area of Bhanga Pourashava. There are no protected areas in or around sub-project site and no known areas of ecological interest. No trees, shrubs, or groundcover will be removed or vegetation stripped without the prior permission. The planted trees will be nurtured by the road slope Pourashava O&M budget.

e. Solid Waste

137. The main causes of non-functionality of the existing drainage system are clogging the drains by the solid waste and inadequate design in some cases. Solid waste generated from the sub-project activities may contribute to the risk of clogging of drains. However, proper solid waste management facilities should be provided in the sub-project areas. Awareness raising camps and demonstration including the house owners regarding the waste management and their roles in keeping the Pourashava drains clean through daily activities. Pourashava authority should also remove the waste materials from drain side within the shortest time and periodic monitoring by the designated person of Pourashava.

D. Scheme Specific Impacts & Mitigations

Table IV-3: Scheme Specific Impacts & Mitigations

PDP no.	Name of schemes	Length (m)		Existing Conditions & Impacts	Mitigations
		UT	DR		
R-005, 006	R-005, 006: Improvement of road by DBC from Faridpur - Barishal Highway to Gozaria Highway Via Razzaq Fakir House a. (Ch. 0.00 m to Ch. 550 m), Faridpur - Barishal Highway to Rail Crossing b. (Ch. 0.00m to Ch. 1010m), Faridpur - Barishal Highway to Fakir Bari c. (Ch. 0.00m to Ch. 355m), d. (Ch. 0.00m to Ch. 531m), Faridpur - Barishal Highway to Nasima House e. ch.00-335m) and Link-f, Ch.00-50m) including Protection Work 315.00 m & installation of Street Light = 100 nos. at ward no. - 02, Bhanga Pourashava, Faridpur. Total Length = 2831.00m.	2831		- Some household waste Dumping site observed - Steep slope beside road - The are some ponds where fish are cultivated by the local people. - Settlement area, a few ponds and fish cultivation site were identified during the environmental survey.	- Barriers should be given at sensitive location - Increase the road height to avoid inundation. - Tree plantation and/or guide wall suggested to avoid soil erosion. - Install road sign both side of the road cross drain and box culvert locations
R-007	Construction of road by RCC from Bhanga Bazar Eidgah Mour to National Pharmacy Part-a. (Ch. 0.00 to Ch. 290m), a. Link -1 (Ch-0.00m to 20m) , a. Link-2 (Ch. 0.00 to 45.00m), Link-3 (Ch. 0.00m to Ch. 40m), Part- b. (Ch. 0.00m to Ch. 360m), b.Link-1 (Ch.00-45.00m),b.Kink-2(Ch.00-40.00m) And Part- c(Ch.00-100.00m) ,c. link-1 (Ch.00-36.00m),c Link-2 (Ch.0.00-60.00m) & installation of Street Light = 35 nos. at ward no. 08, Bhanga Pourashava, Faridpur. Total Length =1036.00 m.	1036		-Water logging occurred during rainy season -Dense population in a settlement area.	-Tree plantation and/or guide wall suggested to avoid soil erosion. - Install road sign both side of the road cross drain and box culvert locations

PDP no.	Name of schemes	Length (m)		Existing Conditions & Impacts	Mitigations
		UT	DR		
R-013	Improvement and widening of road by DBC from Bhanga Thanar Mour to H/O Sahid at Kapuria Sadardi (Ch. 0.00m to Ch. 1107.00m and Link-1: Ch.00-150.00 m.47.00 m Palisading at Ch-1060.00-1107.00 (R/S) & installation of Street Light = 43 nos. at ward no. - 09, Bhanga Pourashava, Faridpur. Total Length =1257m.	1257		- Steep slope beside road -Road condition is good but waterlogging occurs due to absence of drains.	- Barriers should be given at sensitive location. - Tree plantation and/or guide wall suggested to avoid soil erosion.
R-300	Construction of RCC road Starting from Dhaka-Khulna Highway near Padma Specialized Hospital to Old Pourashava DBC Road Via Shahinur Akter's House Ch.0.00-115.00m, Link-1 Road by RCC Starting from Md Shahidul Islam Chunnu House to Kasem House, Ch-0.00-89.00m & installation of Street Light = 7 nos. at ward no. - 04, Bhanga Pourashava, Dist.: Faridpur. Total Length =204.00m.	204		-Some household waste Dumping site observed -Steep slope beside road -The are some ponds where fish are cultivated by the local people. -Settlement area, a few ponds and fish cultivation site were identified during the environmental survey.	-Tree plantation and/or guide wall suggested to avoid soil erosion. - Install road sign both side of the road cross drain and box culvert locations
D-001	Construction of RCC Drain from Bhanga Bazar Graveyard to Kumar River via Mohona Garments at Ch. 0.00m to Ch. 237m.Link-1: ch.00 to 36.00 m and Link-2: Ch.00-60.00 m. Ward no. - 08, under Bhanga Pourashava, Faridpur. Total Length = 333.00m.		333	- No impact on trees, temporary/ permanent structures - Water logging occurred during rainy season - Sensitive receptors were identified during the environmental survey - No impact on biodiversity. - The drain is in residential area. The outfall of proposed U-drain is secondary drain.	- Install warning sign and caution tape - Barriers should be given at sensitive locations. - Spraying of water on the roadways and other dusty surfaces should be done during the dry season. Cover the drain at sensitive location with RCC slab.
D-002	Construction of RCC Drain from Monno Sheikh House to Kumar River at Ch. 0.00m to Ch. 381.0 m and road cross drain Ch.381 to 386.00m ward no. - 01, under Bhanga Pourashava, Faridpur. Total Length = 386m.		386	- Water logging occurred during rainy season - Sensitive receptors were identified during the environmental survey - No impact on biodiversity. - The drain is in residential area. The outfall of proposed U-drain is secondary drain.	- Install warning sign and caution tape - Barriers should be given at sensitive locations. - Spraying of water on the roadways and other dusty surfaces should be done during the dry season. Cover the drain at sensitive location with RCC slab.

PDP no.	Name of schemes	Length (m)		Existing Conditions & Impacts	Mitigations
		UT	DR		
D-004	Construction of RCC Drain with Footpath Starting Dhaka Khulna Highway near Arif Manjil to kumar River near Old Pourashava via Padma Specialized Hospital & Md Shahidul Islam Chunnu House,at Ch-0.00-555.00m and Link-1 Starting From Md Shahidul Islam Chunnu House to Kasem House via Md Shajahan Mia House at Ch-0.00-89.00m. Ward No-04 Under Bhanga Pourashava, Dist-Faridpur. Total Length=644.00m.		644	- Water logging occurred during rainy season - Sensitive receptors were identified during the environmental survey - No impact on biodiversity. - The drain is in residential area. The outfall of proposed U-drain is secondary drain.	- Install warning sign and caution tape - Barriers should be given at sensitive locations. - Spraying of water on the roadways and other dusty surfaces should be done during the dry season. Cover the drain at sensitive location with RCC slab.
D-005 (A)	Construction of RCC Drain Starting from Md Nazrul Islam Khan House near Courtpara Road to Jelepara Culvert at Ch-0.00-130.00m. Ward No-04 Under Bhanga Pourashava, Dist-Faridpur.		130	- Water logging occurred during rainy season - Sensitive receptors were identified during the environmental survey - No impact on biodiversity. - The drain is in residential area. The outfall of proposed U-drain is secondary drain.	- Install warning sign and caution tape - Barriers should be given at sensitive locations. - Spraying of water on the roadways and other dusty surfaces should be done during the dry season. Cover the drain at sensitive location with RCC slab.

c. Cumulative Impact Assessment

138. The cumulative impact assessment examined the interaction between the sub-project's residual effects (i.e., those effects that remain after mitigation measures have been applied) and those associated with other past, existing and reasonably foreseeable future sub-projects or activities. The interaction of residual effects associated with multiple projects and/or activities can result in cumulative impacts, both positive and negative. The project's potential cumulative effects were considered with respect to valued components in environmental and socioeconomic categories, in four areas:
    i. Of any potential residual project effects that may occur incrementally over time;
    ii. Consideration of other known relevant projects or activities within the specified study area boundaries, even if not directly related to the project;
    iii. Potential overlapping impacts that may occur due to other developments, even if not directly related to the proposed sub-project; and
    iv. Future developments that are reasonably foreseeable and sufficiently certain to proceed.
139. Location and sitting of the proposed infrastructures were considered to reduce impacts. Detailed designs integrate a number of measures, both structural and non-structural, to mainstream climate resilience into the Bhanga Road and drain sub-project, including (i) designed to the current best practice standard codes; (ii) built that the floods do not damage them; and (iii) side drains are to be kept free from wastes and siltation.

- Surface Water Quality

140. Surface water quality will not be impacted like present trend due to improved road and drainage system. Illegal or unwanted connections to the improved drains will be controlled and entrance of solid wastes will be prohibited by providing nets at required intervals.

- Socioeconomic and Socio-community

141. Concerns on existing provisions for pedestrians and other forms of transport will occur spatially during construction and O & M activities. Since the sub-project will be improvement of existing infrastructures, it will not conflict with existing or planned land use. However, following improvement in infrastructures and services, added residential developments, commercial, and business facilities and increased densities are expected to develop and enhance Bhanga Pourashava. This can be considered a long-term cumulative benefit of the sub-project.
    i. Given the scale of the project, it is likely that local people will obtain at least temporary socio-economic benefits, by gaining employment in the construction workforce and thus raising their levels of income. These benefits can bring wider social gains if they are directed at vulnerable groups.
    ii. Upon completion of the sub-project, the socio-community will be the major beneficiaries. With the improved traffic management, they will be provided with reliable and climate-resilient road & drain. In addition to improved environmental conditions, the sub-project will reduce occurrence of air borne-related diseases and exposure to climate extremes. People would spend less on healthcare and lose fewer working days

due to illness, so their economic status should also improve, as well as their overall health. Beyond reducing the water-borne and water-washed diseases, providing better access to improved municipal services confers many other diverse benefits ranging from the easily identifiable and quantifiable (costs avoided, time saved) to the more intangible and difficult to measure (convenience, well-being). One set of the benefits related to health impacts that are relatively easy to quantify, are the cost-offsets (costs avoided due to less illness). Cost savings in health care are mainly due to the reduced number of treatments of air borne diseases cases. In addition, patients will avoid costs incurred by seeking treatment, including expenditures on care, drugs and transport and the opportunity costs of time spent on seeking care. Another set of benefits related to less illness are the avoided days lost, with respect to formal or informal employment, other productive activities in the household or school attendance. These are considered a long-term cumulative benefit.

iii. Induced Traffic and Vehicle Emissions: The project is likely to induce additional vehicle ownership and related emissions. This is inevitable with a road designed and maintenance to improve the economic situation of the region, and therefore its use is a measure of its success. Given the nature of the road, and lack of infrastructure development, the additional vehicle emissions induced by the project are not considered to be locally significant; however, they will contribute to global emissions.

d. Analysis of Alternatives

142. Analysis of alternatives has been carried out for 'with' and 'without' the project, location selection, project implementation scheduling and materials usage in the detailed design and construction/Improvement of 4,388m Roads in 3 locations, 657m Protection Work & installation of 155 nos. Street Light at Bhanga Pourashava of Faridpur District under Dhaka Division.

143. **Without Project:** This Pourashava is located at Bhanga Upazila of Faridpur District. The city is expanding along the main road. The Pourashava has insufficient capacity and resources and is finding it difficult to respond to the need for forward planning and investment in basic urban infrastructure and services. This undercut sustainable local urban governance, makes local planning ineffective and undermines local economic development. Bhanga Pourashava is a class-A type Pourashava and one of the renowned Pourashavas in Bangladesh. Most of these roads have uneven-rough surface, damaged topping and pavement sides, narrow in width and without roadside footpath and thus incapable of accommodating road traffic. The road surfaces are worn out partly and, in some cases, entirely. Justifiably, they call for intervention varying from normal significant maintenance to large improvement/ reconstruction. No people/vehicles can move in this road due to water logging/damaged condition in rainy season. The urban centers are characterized by poor infrastructure and low level of urban services. For example: (i) road network is not well planned, and do not have sufficient width. These issues are created by lack of proper master planning, (ii) drainage systems along the roads are not well planned. The current trend of urban migration is being driven by rural poverty, lack of facilities, better scope of education, river erosion, unemployment, migration and natural calamities. In turn, population outmigration from the

Pourashava has often been triggered by the need for higher education and better employment opportunities. For the growing needs of urbanization municipal facilities and development is essential. Physical, social and economic displacement is an inevitable part of the development and may cause involuntary resettlement resulting physical and economic displacement and the issues should be properly mitigated for avoiding development-based suffering of the urban people. The development scenario of the municipality shows a very serious situation.

144. As in any other small towns in Bangladesh, Bhanga has also its own road and transportation deficiencies. A physical feature and traffic survey of major inter-sections revealed that none of these are properly designed. Traffic level is far behind the actual capacity of the junctions. Congestion is created by large number of slow-moving rickshaws waiting for passengers at the inter-sections. Poor maintenance of the roads are the major problems in the town. The misery of road movement during monsoon when unpaved roads get muddy. Narrow width of roads is likely to become a major problem of traffic movement when the town will grow and density of population will increase in future with consequent increase of road traffic. Another problem of community-initiated roads is that they are not in a well linked network. Sometimes links to nearby roads are missing. This causes people to travel comparatively longer distances to reach a nearby destination. Like any other town, which is beyond the regional and national movement directly, Bhanga Pourashava has no traffic management system.

145. The municipal city's roads do not function as an integrated road network due to lack of unplanned and deficient construction and maintenance. A few roads are inadequate due to insufficient capacity and wrong gradient. Similarly, traffic and transportation problems in the Pourashava are increasing because the development and management of the road network has not kept pace with the increasing demand of its users. Traffic congestion, accidents, pedestrian and parking difficulties, air and noise pollution are among the problems. Conditions continue to deteriorate for long periods of the day. If this unplanned construction continues unabated, it will make the environment of the municipality unsuitable and uninhabitable. This situation is causing adverse effects on the main landscape resulting in environmental hazards.

146. **With Project:** Day by day rapid urbanization in and around Bhanga Pourashava & newly growing tourist site and cultural heritage increases its importance with a significant increase in population in the Pourashava area. To cope with the current demand of the increasing population of the Pourashava, the rapid development of different civic facilities for dwellers of Pourashava has now become inevitable. The nearby urban residents in surrounding locality will be benefited from improvement of the proposed sub-project for creating better business and livelihood opportunities. It’s helpful to all classes of people who live at that area. All the local community people of that area will able to go their business, school, college and hospital within shortest time. It is helpful for extension of business which may help to earn so many foreign currencies. By earning lot of foreign currency our economic problem eradicates very soon. Pregnant woman and any ill person can go to any hospital within a small time. The employers of any government or non-government institution and the workers of that institution can go their work place very soon. The farmers can go to nearest town with their agricultural production within very short time and sale that product at high price. Police administration can take immediate action against any offender, such as Murderer, Eve-teaser, etc.

147. In the long run, the subprojects will (i) benefit the environment by planting trees along roadsides, which will also prevent soil erosion from embankment slopes; (ii) improve regional hydrology by reconstruction and rehabilitation of road structures, (iii) reduce dust pollution and improve water quality by bituminizing the pavement, (iv) facilitate and improve access to markets for trade and income generation, (v) allow easy movement of motorized and other traffic, and (vi) generally improve the aesthetic quality of the region. Several numbers of Primary, Secondary and Tertiary roads have been proposed in this Pourashava by considering the hierarchy. In total, 4,388m Roads have been proposed for efficient accessibility of the Pourashava. Traffic management measures may be adopted to increase traffic capacity and safety. The improvement could be done by removing the deficiencies in the existing core road network by improvement and construction of roads in a phased manner and improvement of safety provisions.

148. **Material Usage and Sustainability Considerations:** Under the circumstances, this subproject has been proposed as comprising different infrastructure development under different components. The subproject components aim at upgrading and expansion of urban services, including (i) one connecting road from Pourashava to the national highway and other neighboring industrial & commercially important places for better transportation; (ii) three roads with flood management schemes. The proposals are entirely concerned with activities that address the most acute needs for better urban services and facilities for inhabitants of the Pourashava. Different infrastructure development components under the subproject proposed for construction and development are consistent. Rehabilitation, construction, expansion of the basic infrastructures to improve transportation facilities, increasing pure water supply and improving sanitation system, planned solid waste management etc. to improve the environment and sustain an ecological balance and quality of livelihood. On the other hand, the objectives are, as well, to improve the Pourashava governance, capacity building, financial sustainability and participation of the stakeholders and residents in the activities of the PS to transform it to a 'Model Pourashava. Hence project scenario is highly desirable. While the 'with subproject scenario' may have negative environmental impacts from construction activities, the environmental impacts are projected to be temporary and short-term in nature. The impacts during construction and operation phase are not irreversible and can be readily mitigated.

149. Vulnerabilities of Pourashavas to climate risks include (i) low-lying topography subject to flooding and waterlogging; (ii) changes in the landscape due to construction and urban expansion, with reduced capacity to buffer impacts from floods and landslides; (iii) poor awareness of vulnerable populations; and (iv) weak institutional capacities and strategic planning of Pourashavas in managing climate risks. Overall, Pourashavas need to address climate risks better through improved planning, zoning, and sustaining climate-resilient and gender responsive infrastructure and services.

150. It is clear from the above that without project scenario is undesirable and the location of Sub-project has been strategically selected with only short-term and reversible environmental impacts. To make the project outcome and outputs sustainable, necessary measures have been included in the project design.

VI. INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

A. Purpose of Public Participation

151. The development and construction of any project will impact on the surrounding human and physical environment and will have beneficial or adverse effects. It is therefore essential that the community can fully understand the project, have the opportunity to express their views and to become directly involved in the project's overall decision-making process.
152. Public authority developers must take account of the community's views and include any useful suggestions to improve the sub-project. This may include suggestions to help further develop environmental protection measures thereby reducing environmental pollution, reducing the loss of environmental resources and improve the project's environmental and social benefits, thus helping achieve more sustainable development.
153. In accordance with the requirements of the ADB as defined in the SPS 2009, the ''borrower will carry out meaningful consultation with affected people and other concerned stakeholders, including civil society, and facilitate their informed participation'' The following activities have therefore been carried out in his project in accordance with the ADB requirements.

B. Consultation during Detailed Design Phase

154. The public participation process included (i) identifying interested and affected parties (stakeholders); (ii) informing and providing the stakeholders with sufficient background and technical information regarding the proposed development; (iii) creating opportunities and mechanisms whereby they can participate and raise their viewpoints (issues, comments, and concerns) with regard to the proposed development; (iv) giving the stakeholders feedback on process findings and recommendations; and (v) ensuring compliance to process requirements with regards to the environmental and related legislation.
155. MDS safeguard team conducted public consultations on 02 April & 03 April 2024. The objective of the meetings was to appraise the stakeholders about environmental and social impacts of the proposed sub-project and safeguards to mitigate the same. A questionnaire was designed and environmental information was collected. Key respondents included project-affected persons, who may suffer temporary access disruptions during construction activities from the sub-project area and daily commuters consulted randomly. Issues discussed and feedbacks received are given in Table V-7. The list of participants along with details of date, time, and location is given in Appendix 6. The environmental concerns and suggestions made by the participants were listed, and discussed, and suggestions accordingly incorporated in the EMP. These include speedy construction works to ensure low impacts to community during road closures and local employment.
156. The Project has already organized consultation training program for all staff working in IUGIP, consultants and Pourashava staff on safeguard policies. The aim of the consultation program was to inform all stakeholders about the importance of the safeguard policies and their implementation at the design construction and operation stage. Field consultations were conducted with local people. Consultations by the PIU supported by the RES and the PMU include the following:

- Focus-group discussions (FGDs) and Workshop with affected persons and other stakeholders (including women's groups, NGOs and CBOs) to hear their views and concerns, were conducted and concerns were addressed in sub-project design.
- Structured consultation meetings with the institutional stakeholders (government bodies and NGOs) to discuss and approve key aspects of the sub-project.

Table IV-4: Outcome of the Public Consultation

Sl. No.	Key Issues/Demands	Perception of Community	Action to be Taken
1	Awareness of the project including coverage area	Yes, they are aware of the project that will be improved.	No need to take action.
2	In what way they may associate with the sub-project	They will give all types of cooperation for implementation of the sub-project	More consultation before start of the sub-project.
3	Presence of any forest, wildlife or any sensitive/ unique environmental components nearby the project area	Not anticipated	No need to take action.
4	Presence of historical/cultural/ Religious sites nearby	Not anticipated	No need to take action.
5	Unfavorable climatic condition	During the rainy season, the town become flooded if heavy rainfall occurs within short duration.	Design the drain adequately.
6	Occurrence of flood	The city often inundated due to heavy rainfall for short duration. No major flood occurred recently.	Design the drain adequately.
7	Drainage and sewerage problem facing	The town has proper master drains covering most portion of the city to carry waste water. Therefore, no major problem with water logging in normal condition.	Design the drain adequately.
8	Availability of labour during construction time	Yes, Local labour is available.	No need to take action.
9	Dust and noise pollution disturbances during construction work	Yes, they know the impact will be short-term & negligible.	EMP will be prepared to minimize the impact.
10	Setting up construction camp site within the villages/project locality	Yes, no construction camp is required for this sub-project.	No camp or storage site within locality

Sl. No.	Key Issues/Demands	Perception of Community	Action to be Taken
11	Safety of residents during construction phase and plying of vehicle for construc-tion activities	Yes, they are aware of the safety issues	Awareness programs will be taken before start of the construction work.

a. Summary of Consultations Outcome

157. Dilapidated roads will be renovated soon. It will bring a momentum in the socio-economic activities of the Pora inhabitants. Access of the common people to all the civic amenities will be facilitated at it. Small scale business will be promoted. Hospitalization will be easier. The law & order situation will improve.

Figure IV-6: Consultation and FGD at Bhanga Pourashava

C. Consultation during Construction Phase

158. Public meetings held with the adjoining communities of the proposed infrastructure, to discuss the probable work plans and the environmental impacts with mitigation measures to be taken during construction phase.

D. Sub-project Disclosure

159. Steps taken for disclosing the sub-project:

- For the benefit of the community, the summary of the IEE will be discussed with the local people prior to the construction and consultations during construction period for their information of the sub-project activities. It will be ensured that the hard copies of IEE are kept at places which are conveniently accessible to people, as a means to disclose the document and at the same time creating wider public awareness. An electronic version of the IEE will be placed in the official website of executing and implementing agencies and

the ADB website after approval of the IEE by ADB. In addition to the above the below actions also could be taken as disclosure of the information.

- Public information campaigns (via newspaper, flyers, banners, and poster) to explain the sub-project to the wider city population and prepare them for disruption they may experience once the construction program is underway;
- Public disclosure meetings at key sub-project stages to inform the public of progress, future plans and to provide copies of summary documents in local language;
- Formal disclosure of completed sub-project reports by making copies available at convenient locations in the study areas and informing the public of their availability, and
- Providing a mechanism through which comments can be made.
- A project-specific grievance redress mechanism (GRM) will be established to receive, evaluate, and facilitate the resolution of AP'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. Common GRM

160. A common GRM will be in place for social, environmental, or any other grievances related to the project; the resettlement plans (RPs) and IEEs 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.
161. Pourashava-wide public awareness campaigns will ensure that awareness on grievance redress procedures is generated through the campaign. The project implementation unit (PIU) and governance improvement and capacity development consultants (GICDC) will conduct Pourashava-wide awareness campaigns to ensure that poor and vulnerable households are made aware of grievance redress procedures and entitlements and will work with the PMU and management, design and supervision consultants (MDSC) to help ensure that their grievances are addressed.
162. Affected persons (APs) 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 Pourashavas or through telephone hotlines at accessible locations, by e-mail, by post, or by writing in a complaint register in Pourashava 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 project management office (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.

B. General

163. The objective the grievance redress mechanism (GRM) is to resolve complaints as quickly as possible and at the local level through a process of conciliation; and, if that is not possible, to provide clear and transparent procedures for appeal. A well-defined grievance redress and resolution mechanism will be established to resolve grievances and complaints in a timely and satisfactory manner. All affected persons will be made fully aware of their rights, and the detailed grievance redress procedures will be publicized through an effective public information campaign.

C. Grievance Redress Process

164. In case of grievances that are immediate and urgent in the perception of the complainant, the contractor and MDSC 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 PIU safeguard focal person and contractors; will be posted at all construction sites at visible locations.

a. 1st Level Grievance

165. The phone number of the PIU office should be made available at the construction site sign-boards. The contractors and PIU 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. 2nd Level Grievance

166. All grievances that cannot be redressed within 7 days at field/ward level will be reviewed by the grievance redress cell (GRC) headed by Panel Mayor of the Pourashava with support from PIU designated safeguard focal person and MDSC regional 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. 3rd Level Grievance

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

168. 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.

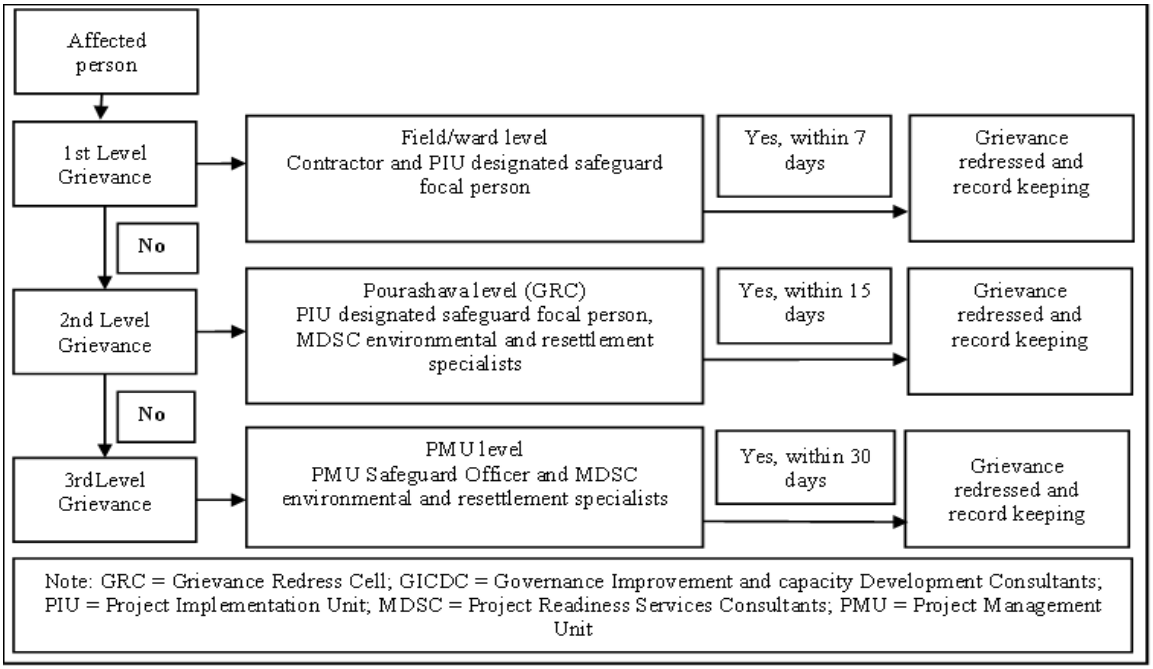


Figure VII-1: Project Grievance Redress Mechanism

D. Recordkeeping

169. 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 PIU. The number of grievances recorded and resolved and the outcomes will be displayed/disclosed in the PMU office, Pourashava office, and on the web, as well as reported in monitoring reports submitted to ADB on a semi-annual basis.

E. Periodic Review

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

F. Costs

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

VIII. ENVIRONMENTAL MANAGEMENT PLAN

A. Objectives of the EMP

172. The purpose of the environmental management plan (EMP) is to ensure that the activities are undertaken in a responsible, non-detrimental manner with the objectives of:
    - providing a proactive, feasible, and practical working tool to enable the measurement and monitoring of environmental performance on-site;
    - guiding and controlling the implementation of findings and recommendations of the environmental assessment conducted for the project;
    - detailing specific actions deemed necessary to assist in mitigating the environmental impact of the sub-project; and
    - ensuring that safety recommendations are complied with.
173. A copy of the EMP must be kept on work sites at all times. This EMP is included in the bid documents and will be further reviewed and updated during implementation. The EMP 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.
174. For civil works, the contractor will be required to (i) establish an operational system for managing environmental impacts (ii) carry out all of the monitoring and mitigation measures set forth in the EMP; 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 IEE and EMP. The contractor shall allocate a budget for compliance with these EMP measures, requirements and actions.

B. EMP – Mitigation Measures

175. Mitigation measures for each of the impacts listed in the Table VIII.1 in accordance with the chapter V. Responsible institutions/departments for the implementation and supervision of each of the environmental issues have also been illustrated. Mitigation measures have been suggested based on the knowledge of the Environmental Specialist, suggestions of the stakeholders collected during public consultation, and opinions from other relevant specialists.
176. 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 Management Plan – Mitigative Measures

Ref. No.	Issues & Impacts	Mitigation Measures	Responsible for	
			Implementation	Supervision
Pre-construction Phase				
1.1	**Obtaining of SCC/NOCs** Failure to obtain necessary consents, permits, NOC's can result in design revisions and/or stoppage of the Works.	▪ The proposed road and drain will be constructed in Pourashava own land and existing road and drain networks, that's why all necessary consents, permits, clearance, etc. not required to be obtain before start of civil works (ensured from DDR report).	PIU/Contactor	MDSC
1.2	**Updating of EMP based on necessary** Specific impacts will be identified as per design updating and construction works	▪ Update IEE and EMP as per necessary of detail design and construction works ▪ Ensure updated EMP is provided to contractors	PMU/ MDSC	MDSC
1.3	**Existing Utilities** Disruption of services (short term).	▪ Drawing from the consultant's visit, there was no utility or services found. Therefore, disruption in services is not expected. ▪ There is no vegetation alongside the existing Right Off Ways and proposed site. In addition, there is no water body nearby. No impact is expected on flora and fauna. ▪ Require construction contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services. ▪ Existing infrastructure (such as water distribution pipes, electric pole, and shop/boundary wall etc.) shall be relocated before construction starts at the sub-project sites. ▪ 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. ▪ If construction work is expected to disrupt users of community water bodies, notice to the affected community shall be served 7 days in advance and again 1 day prior to start of construction.	Contractor	MDSC/PIU
1.4	**Construction Camps, & Stock Yards** Disruption to traffic flow and sensitive receptors Water body and agricultural land may be disturbed	▪ Determine locations prior to award of construction contracts. ▪ Avoid nearby water body, educational institutes and agricultural land	Contactor	MDSC/PIU

Ref. No.	Issues & Impacts	Mitigation Measures	Responsible for	
			Implementation	Supervision
1.5	**Sources of Materials** 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 pollution.	▪ Prepare list of approved quarry sites and sources of materials ▪ Select authorized supplier	Contactor	MDSC/PIU
1.6	**EMP Implementation Training** Irreversible impact to the environment, contactor representative/workers, Pourashava officials	▪ Training will be required to undergo EMP implementation including waste management, Standard operating procedures (SOP) for construction works; health and safety (H&S), core labor laws, applicable environmental laws, etc	Contractor	PMU/PIU
2.0 Construction Phase				
2.1	**Topography, Landforms, Geology** Significant amount of gravel, sand, bitumen and cement will be required for this sub-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.	▪ Utilize readily available sources of materials. If contractor procures materials from existing burrow pits and quarries, ensure these conform to all relevant regulatory requirements. ▪ Borrow areas and quarries (If these are being opened up exclusively for the sub-project) must comply with environmental requirements, as applicable. No activity will be allowed until formal agreement is signed between PIU, landowner and contractor.	Contractor	MDSC/PIU
2.2	**Soil Quality** ▪ Leakages of oil and chemical materials from construction activity ▪ Inappropriate disposal of waste ▪ Exhaust gas and dust from vehicles	▪ Storage of oil and chemical materials in an appropriate storage site and method to prevent permeation into the ground. ▪ Prohibit illegal dumping ▪ Soil quality monitoring	Contractor	MDSC/PIU
2.3	**Surface/Waste Water Quality** Trenching and excavation, run-off from stockpiled materials, and contamination from fuels and lubricants may	▪ Prepare and implement a waste management plan (see Appendix 1 for outline). ▪ Prioritize re-use of excess waste and materials in construction activities. If waste will be disposed, consult with BHANGA local authority on designated disposal areas.	Contractor	MDSC/PIU

Ref. No.	Issues & Impacts	Mitigation Measures	Responsible for	
			Implementation	Supervision
	result to silt-laden runoff during rainfall which may cause reduction in the quality of adjacent bodies of water. Surface water pollution is expected but minor negative and short term, site-specific within a relatively small area and reversible by mitigation measures.	▪ All earthworks must be conducted during dry season to the maximum extent possible to avoid the difficult working conditions that prevail during monsoon season such as problems from runoff. ▪ Water quality will be tested pre-during-post construction by contactor. ▪ Location for stockyards for construction materials shall be identified far away from watercourses. ▪ Place storage areas for fuels and lubricants away from any drainage leading to water bodies. ▪ Take precautions to minimize the wastage of water in the construction activities. ▪ Take all precautions to prevent entering of wastewater into nearby watercourses. Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies. ▪ Ensure diverting storm water flow during construction shall not lead to inundation and other nuisances in low lying areas. ▪ Ensure no construction materials like earth, stone, or appendage are disposed of in a manner that may block the flow of water		
2.4	**Groundwater Quality** 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).	▪ 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. ▪ Wells used for drinking will be tested quarterly to ensure portability.	Contractor	MDSC/PIU
2.5	**Air quality** 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	▪ Water spraying to control dust as per necessary; ▪ Use tarpaulins to cover soils, sand and other loose material when transported by trucks. ▪ Unpaved surfaces used for haulage of materials within settlements shall be maintained dust-free. ▪ Arrangements to control dust through provision of windscreens, water sprinklers. ▪ Air quality will be tested pre-during-post construction by contactor	Contractor	MDSC/PIU

Ref. No.	Issues & Impacts	Mitigation Measures	Responsible for	
			Implementation	Supervision
	impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.			
2.6	**Noise & Vibration** Temporary increase in noise level and vibrations may be caused by excavation equipment, transportation of equipment, construction materials and construction activity. However, the proposed sub-project will be existing location and impact is short-term, site-specific and within a relatively small area. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	▪ Involve the community in planning the work program so that any particularly noisy or otherwise invasive activities can be scheduled to avoid sensitive times. ▪ Plan activities in consultation with BHANGA local authority so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance. ▪ Use of high noise generating equipment shall be avoided. ▪ Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach; ▪ Utilize modern vehicles and machinery with the requisite adaptations to limit noise and exhaust emissions, ▪ All vehicles and equipment used in construction shall be fitted with exhaust silencers. Use silent-type generators (if required). ▪ 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. ▪ 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. ▪ 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. ▪ Noise level will be tested pre-during-post construction by contactor	Contractor	MDSC/PIU
2.7	**Waste Pollution** ▪ Construction waste from construction work ▪ Domestic waste from workers ▪ Hazardous waste	▪ Follow the 'Waste Management Plan' in Appendix 1. ▪ Conduct separate waste collection and promote recycling and reuse. ▪ Appropriate disposal of non-recyclable waste according to rules ▪ Hazardous waste should be treated under the related regulation	Contractor	MDSC/PIU
2.8	**Aesthetics** The construction activities do not anticipate any cutting of trees but will	▪ Follow the waste management plan properly (Appendix 1) ▪ Remove all construction and demolition wastes on a daily basis.	Contractor	MDSC/PIU

Ref. No.	Issues & Impacts	Mitigation Measures	Responsible for	
			Implementation	Supervision
	produce excess excavated earth (Soils), excess construction materials, and solid waste such as removed concrete, wood, packaging materials, empty containers, Soils, 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.	▪ Coordinate with BHANGA local authority for beneficial uses of excess excavated soils or immediately dispose to designated areas Avoid stockpiling of any excess Soils ▪ Suitably dispose of collected materials from construction site, unutilized materials and debris either through filling up of pits/wasteland or at pre-designated disposal locations. ▪ No construction materials like earth, stone, rod, polythene, paper, wood and concrete are kept in the sub-project area that may block the flow of water of existing drains. ▪ Clean the construction side road/drain regularly. ▪ All vehicles delivering fine materials to the site and carrying waste debris for disposal shall be covered to avoid spillage of materials. All existing roads used by vehicles of the contractor, shall be kept clear of all dust/mud or other extraneous materials dropped by such vehicles. ▪ Lighting on construction sites at night. ▪ In areas where the visual environment is particularly important or privacy concerns for surrounding buildings exist, the site may require screening. This could be in the form of shade cloth, temporary walls, or other suitable materials prior to the beginning of construction. ▪ The site must be kept clean to minimize the visual impact of the site.		
2.9	**Biodiversity** Activities being located in the built-up area of BHANGA Pourashava. There are no protected areas in or around existing sub-project sites, and no known areas of ecological interest. There are no trees at the site that need to be removed.	▪ No trees, shrubs, or groundcover may be removed or vegetation stripped without the prior permission of the environment specialist. ▪ If during construction period cutting of trees will be required, compensatory plantation for trees lost at a rate of 2 trees for every tree cut. ▪ All efforts shall be made to preserve trees by evaluation of minor design adjustments/ alternatives (as applicable) to save trees. ▪ Special attention shall be given for protecting giant trees and locally-important trees (with religious importance) during implementation. ▪ 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 sub-project vicinity. ▪ Prohibit employees from poaching wildlife and cutting of trees for firewood	Contractor	MDSC/PIU
2.10	**Traffic Congestion**	▪ Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites.	Contractor	MDSC/PIU

Ref. No.	Issues & Impacts	Mitigation Measures	Responsible for	
			Implementation	Supervision
	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.	▪ Maintain safe passage for vehicles and pedestrians throughout the construction period. ▪ Schedule truck deliveries of construction materials during periods of low traffic volume. ▪ Erect and maintain barricades, including signs, markings, flags and flagmen informing diversions and alternative routes when required. ▪ Notify affected sensitive receptors by providing sign boards informing nature and duration of construction activities and contact numbers for concerns/complaints. ▪ Provide walkways and metal sheets where required to maintain access across for people and vehicles. ▪ Increase workforce in front of critical areas such as institutions, place of worship, business establishment, hospitals, and schools. ▪ 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, ▪ Ensure any damage to properties and utilities will be restored or compensated to pre-work conditions.		
2.11	**Socio-economic status** Sub-project components will be located in Pourashava land and there is no requirement for land acquisition or any resettlements. 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.	▪ 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. ▪ Secure construction materials from local market. ▪ To ensure engage women employee as per gender action plan	Contractor	MDSC/PIU
2.12	**Community Health and Safety** Construction works will impede the access of residents and businesses in limited cases. The impacts are negative but short-term, site-specific within a	▪ Provide safety signage at construction sites visible to public ▪ Provide safety barriers near any trenches, and cover trenches with planks during non-work hours. ▪ Contractor's activities and movement of staff will be restricted to designated construction areas.	Contractor	MDSC/PIU

Ref. No.	Issues & Impacts	Mitigation Measures	Responsible for	
			Implementation	Supervision
	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.	▪ Consult with BHANGA local authority on the designated areas for stockpiling of, soils, gravel, and other construction materials. ▪ If the contractor chooses to locate the work camp/storage area on private land, he must get prior permission from the environment specialist and Pourashava. ▪ Recycling and the provision of separate waste receptacles for different types of waste shall be encouraged. ▪ 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. ▪ 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 Sr./regional environmental specialist's attention immediately; and (iv) taking remedial action as per Sr./regional environment specialist's instruction. ▪ 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 national/regional environmental specialist within 48 hours of receipt of such complaint/grievance.		
2.13	**Workers Health and Safety** 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	▪ Comply with requirements of Government of Bangladesh Labor Law of 2006 & 2015 and all applicable laws and standards on workers H&S. ▪ Ensure that all site personnel have a basic level of environmental awareness training. If necessary, the environmental management specialist and/or a translator shall be called to the sites to further explain aspects of environmental or social behaviour that are unclear.	Contractor	MDSC/PIU

Ref. No.	Issues & Impacts	Mitigation Measures	Responsible for	
			Implementation	Supervision
	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.	▪ Produce and implement a site health and safety (H&S) plan which include measures as: (i) excluding the public from worksites; (ii) ensuring all workers are provided with and required to use personal protective equipment (reflectorized vests, footwear, gloves, goggles and masks) at working times; (iii) providing (H&S) training for construction site personnel; (iv) documenting procedures to be followed for all site activities; and (v) maintaining accident reports and records. ▪ Arrange for readily available first aid unit including an adequate supply of sterilized dressing materials and appliances ▪ Maintain necessary living accommodation and ancillary facilities in functional and hygienic manner in work camps. Ensure (i) uncontaminated water for drinking, cooking and washing, (ii) clean eating areas where workers are not exposed to hazardous or noxious substances; (iii) providing fire extinguisher at construction site and (iv) sanitation facilities are available at all times. ▪ Provide medical insurance coverage for workers; ▪ Provide H&S orientation training to all workers to ensure that they are apprised of the basic site rules of work at the site, PPE, and preventing injuring to fellow workers; ▪ Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas; ▪ Disallow worker exposure to noise level greater than 85 dBA for duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.		
2.14	**Post-construction Clean-up** Damage due to debris, Soils, excess construction materials	▪ Remove all Soils wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; and. ▪ All disrupted utilities restored ▪ All affected structures rehabilitated/ compensated ▪ 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. ▪ 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. ▪ The contractor must arrange the cancellation of all temporary services.	Contractor	MDSC/PIU

Ref. No.	Issues & Impacts	Mitigation Measures	Responsible for	
			Implementation	Supervision
		▪ Request PMU/PIU to report in writing that worksites and camps have been vacated and restored to pre-project conditions before acceptance of work.		
2.15	**Submission of EMP Implementation Report** Unsatisfactory compliance to EMP	▪ Appointment of supervisor/Manager to ensure EMP implementation ▪ Timely submission of Progress report/environmental monitoring reports including pictures	Contractor	MDSC/PIU
3.0 Operation Phase				
3.1	**Air Quality** ▪ Exhaust gas from vehicles used for mobilization of equipment and workers ▪ Dust from road and drain	▪ Provisions of Pourashava budget for operation & maintenance of the road; ▪ Awareness raising camps and demonstration including the transport owners and drivers; ▪ Watering the roads during dry season; ▪ Periodic monitoring;	Pourashava	Pourashava
3.2	**Noise Level** ▪ Noise caused by vehicles moving along the road carrying passengers and goods.	▪ Provisions of Pourashava budget for operation & maintenance; ▪ Awareness raising camps and demonstration including the transport owners and drivers; ▪ Prohibit the use of hydraulic horns; ▪ Use of signs at sensitive locations; ▪ Periodic monitoring;	Pourashava	Pourashava
3.3	**Surface/Waste Water Quality** ▪ Surface water runoff to nearby lands ▪ Ponds along the road ▪ Waste water to the khal	▪ Provisions of Pourashava budget for operation & maintenance of drains; ▪ Water quality test from the drain outfall once in a year take mitigation measures accordingly. ▪ If the water quality of the river will be deteriorated then check the drains within the sub-project at first and others drain accordingly. ▪ Awareness raising camps and demonstration including the house owners; ▪ Cleaning the drains regularly; ▪ Prohibit the illegal connections to the drains; ▪ Periodic monitoring;	Pourashava	Pourashava
3.4	**Waste Management** Clogging of drains.	▪ Provisions of Pourashava budget for operation & maintenance of drains; ▪ Awareness raising camps and demonstration including the house owners; ▪ Do not throw plastic materials in to the drains; ▪ Remove the waste materials from drain side within the shortest time; ▪ Periodic monitoring;	Pourashava	Pourashava

Ref. No.	Issues & Impacts	Mitigation Measures	Responsible for	
			Implementation	Supervision
3.5	**Road Accident** Increase of road accident due to additional traffics	▪ Provide road safety signs and speed bumps/speed breaker at the densely populated/accident prone area such as school, college, commercial area etc. ▪ Provide training to community people to aware about road safety	Pourashava	Pourashava

C. Environmental Monitoring Plan

177. The monitoring plan is one of the important tools of the implementing the mitigation plan for the proposed road/drain sub-project. The Monitoring plan provides guidance regarding environmental issues/parameters, location, frequency and means of monitoring.

178. The aim of environmental monitoring during the pre-construction, construction and operation phases of the sub-project road/drain 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, wildlife movement, workers' and community health and safety and so on need to be developed.

179. An Environmental Monitoring Plan (EMoP) has been prepared (Table VIII.2) along with this IEE for the execution as a means to mitigate or minimize the adverse impacts associated with construction and operational activities of the project on the natural and social environments.

a. Objectives

180. The objective of environmental monitoring during the construction and operation phases is to compare the monitored data against the baseline condition collected during the study period to assess the effectiveness of the mitigation measures and the protection of the ambient environment based on national standards. The main objectives of the pre-construction, construction and operation phase monitoring plans will be to:

i. Monitor the actual impact of the works on physical, biological and socioeconomic receptors within the project corridor for indicating the adequacy of the IEE;
ii. Recommend mitigation measures for any unexpected impact or where the impact level exceeds that anticipated in the IEE;
iii. Ensure compliance with legal and community obligations including safety on construction sites;
iv. Monitor the rehabilitation of borrow areas and the restoration of construction campsites as described in the EMP;
v. Ensure the safe disposal of excess construction materials.
vi. Appraise the adequacy of the IEE with respect to the project's predicted long-term impacts on the corridor's physical, biological and socio-economic environment;
vii. Evaluate the effectiveness of the mitigation measures proposed in the EMP and recommend improvements, if and when necessary;
viii. Compile periodic accident data to support analyses that will help minimize future risks; and
ix. Monitor the survival rate of avenue plantations.

Table VIII-2: Environmental 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
1.0 Pre-construction Phase								
1.1	**Obtaining of SCC/NOCs**	Failure to obtain necessary consents, permits, NOC's can result in design revisions and/or stoppage of the Works.	Compliance to GoB and ADB policies	Obtaining certificates	Pourashava	Prior to contractor mobilization	PMU/PIU	PMU/MDSC
1.2	**Updating of EMP**	Specific impacts will be identified as per design updating and construction works	Ensuring the compliance with construction schedule	Preparation of report	PMU	During the pre-construction period	MDSC	PMU
1.3	**Existing Utilities**	Disruption of services (short term).	Implementation of EMP	Obtain record of implantation	In the work site	Prior to contractor mobilization	Contractor	PIU/MDSC
1.4	**Construction Camps, & Stock Yards**	Disruption to traffic flow and sensitive receptors Water body and agricultural land may be disturbed	Implementation of EMP	Obtaining approval from MDSC/PIU	In the work site	Prior to contractor mobilization	Contractor	PIU/MDSC
1.5	**Sources of Materials**	Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns along roads,	Compliance with GoB laws and Implementation of EMP	Obtaining approval from MDSC/PIU	Pourashava	During the pre-construction period	Contractor	PIU/MDSC

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
		ponding and water logging, and water pollution.						
1.6	**EMP Implementation Training**	Irreversible impact to the environment, contactor representative/workers, Pourashava officials	Implementation of EMP	Obtain record of training	PMU/PIU	Prior to contractor mobilization	MDSC	PMU
2.0 Construction Phase								
2.1	**Topography, Landforms, Geology**	Significant amount of gravel, sand, rod, and cement will be required for this sub-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.	▪ Restoration of changes due to construction activities ▪ Visual amenity	▪ Visual inspection & consultation with local people	▪ In the work site	During construction period	Contractor	MDSC/PIU
2.2	**Soil Quality**	Significant amount of soil will be required for this sub-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.	▪ Restoration of changes due to construction activities ▪ Visual amenity	▪ Soil quality test report ▪ Parameters for testing are Organic Matter, Zn, Sulphur, Lead and Nitrate	▪ Road sub-project ▪ Road-BP-R-005, 006	▪ During construction period ▪ **Once during construction**	Contractor	MDSC/PIU

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
2.3	**Surface/Waste water Quality**	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. **Surface water pollution is expected but minor negative and short term, site-specific within a relatively small area and reversible by mitigation measures.**	Evaluation of effect of the mitigation measure towards water pollution	▪ Visual inspection & consultation with local people ▪ Water quality test report ▪ Surface/Waste water parameters: pH, Temperature, ORP, DO, Phosphate, Alkalinity, Sulphate, Fe, EC, TDS, TSS, Nitrate, COD, and BOD	▪ In the work site ▪ Drain outfall location.	▪ **Once during pre-construction** ▪ Twice during construction period	Contractor	MDSC/PIU
2.4	**Groundwater Quality**	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	▪ Record of water borne diseases ▪ Water quality test report ▪ Groundwater parameters: pH, DO, Lead, Fe, EC, TDS, Nitrate, As, TC, FC, Cl, Ca, and Manganese	▪ Groundwater from construction camp	▪ **Once during pre-construction** ▪ Twice during construction period	Contractor	MDSC/PIU
2.5	**Air quality**	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	Evaluation of effect of the mitigation measure towards air pollution	▪ Visual inspection & consultation with local people ▪ Air quality test report	▪ In the work site ▪ Road-BP-R-005, 006	▪ **Once during pre-construction** ▪ Twice during construction period	Contractor	MDSC/PIU

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
		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.		▪ Parameters are PM_{10}, $PM_{2.5}$, SOx, NOx, and CO				
2.6	**Noise & Vibration**	Temporary increase in noise level and vibrations may be caused by excavation equipment, transportation of equipment, construction materials and construction activity. However, the proposed sub-project will be existing location and impact is short-term, site-specific and within a relatively small area. 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 noise pollution	▪ Visual inspection & consultation with local people ▪ Noise level test report ▪ LAeq (Day & Night)	▪ In the work site ▪ Road- BP-R-007	▪ Once during pre-construction ▪ Twice during construction period	Contractor	MDSC/PIU
2.7	**Waste Pollution**	▪ Construction waste from construction work ▪ Domestic waste from workers ▪ Hazardous waste	Evaluation of effect of the mitigation measure for waste	Record of kinds and quantity of waste, and the disposal method	▪ Along the roads ▪ Worker's camp	During construction period	Contractor	MDSC/PIU

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
2.8	**Aesthetics**	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 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.	Evaluation of effect of the mitigation measure	Visual inspection & consultation with local people	In the work site	During construction period	Contractor	MDSC/PIU
2.9	**Biodiversity**	Activities being located in the built-up area of Bhanga Pourashava. There are no protected areas in or around existing sub-project sites, and no known areas of ecological interest. There are no trees at the site that need to be removed.	▪ 90 tree plantations along Road-BP-R-005 and BP-R-013 ▪ Confirm that this planting plan is following during the construction period. ▪ Also confirm that grass turfing and road network instalment is preventing surface runoff and erosion.	▪ Visual inspection ▪ Record of plant survival percentage	In the work site and nearby homestead vegetation	During construction period	Contractor	MDSC/PIU

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
2.10	**Traffic Congestion**	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	▪ Visual inspection & consultation with local people ▪ Record of accidents ▪ Record of numbers construction vehicles	In the work site	During construction period	Contractor	MDSC/PIU
2.11	**Socio-economic status**	Sub-project components will be located in Pourashava land and there is no requirement for land acquisition or any resettlements. 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.	Evaluation of effect of construction schedule	Consultation with local people	In the project area	During construction period	Contractor	MDSC/PIU
2.12	**Community health and safety**	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	▪ Visual inspection & consultation with local people ▪ Record of accidents	In the project area	During construction period	Contractor	MDSC/PIU

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
2.13	**Worker's health and safety**	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	▪ Visual inspection & consultation with worker ▪ Record of accidents	In the work site	During construction period	Contractor	MDSC/PIU
2.14	**Post-construction clean-up**	Damage due to debris, spoils, excess construction materials	Evaluation the implementation of EMP	▪ Visual inspection & consultation with local people ▪ Reporting	In the work site	At the end of construction period along with the EMP implementation report	Contractor	MDSC/PIU
2.15	**Submission of EMP implementation report**	Unsatisfactory compliance to EMP	Evaluation the implementation of EMP	Record of report submission	MDSC/PMU	At the end of construction period	Contractor	MDSC/PIU
3.0 Operation Phase								
3.1	**Air Quality**	Movement of vehicle will create air quality	Visual inspection, and consultation with local people	▪ O&M budget for periodic monitoring	Pourashava area	During operation period	Pourashava	Pourashava

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
3.2	**Noise Level**	Movement of vehicle will create noise level	Monitoring, and consultation with local people	▪ O&M budget for periodic monitoring	Pourashava area	During operation period	Pourashava	Pourashava
3.3	**Surface/Waste Water Quality**	The surface water might be contaminated due to waste water carrying by the roads	▪ Visual inspection and consultation with worker ▪ Waste water quality test	▪ O&M budget for periodic monitoring	Pourashava area	During operation period	Pourashava	Pourashava
3.4	**Health & Safety**	Worker involved in cleaning and maintaining the roads may get sick if not trained and provided the PPE adequately	Visual inspection and consultation with worker	▪ O&M budget for periodic monitoring	Pourashava area	During operation period	Pourashava	Pourashava
3.5	**Waste Management**	Worker involved in waste management and maintaining the sub-project may get sick if not trained/awareness adequately	Visual inspection and consultation with worker	▪ O&M budget for periodic monitoring	Pourashava area	During operation period	Pourashava	Pourashava
3.6	**Road Accident**	Increase of road accident due to additional traffics	Visual inspection, record of accidents and consultation with local people	▪ O&M budget for periodic monitoring	Pourashava area	During operation period	Pourashava	Pourashava

D. Institutional Capacity Development Program

181. The MDSC and regional environmental specialists are responsible for trainings on environmental awareness and management in accordance with both ADB and government requirements. Specific modules customized for the available skill set will be devised after assessing the capabilities of the target participants and the requirements of the project. Typical modules would be as follows: (i) sensitization; (ii) introduction to environment and environmental considerations in water supply and waste water projects; (iii) review of IEEs and integration into the project detailed design; (iv) improved coordination within nodal departments; and (v) monitoring and reporting system. The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work sites. The proposed training project along with the frequency of sessions is presented in Table VIII-3.

Table VIII-3: Training Program for Environmental Management

Items	Pre-construction/prior to construction	Construction	
Training Title	Orientation workshop	Orientation program/ workshop for contractors and supervisory staffs	Experiences and best practices sharing
Purpose	• To aware the participants of the environmental safeguard requirements of ADB and GOB and how the project will meet these requirements • Training Program for Environmental Management	• To build the capacity of the staffs for effective implementation of the designed EMPs aimed at meeting the environmental safeguard compliance of ADB and GoB • To aware the contractor's representative/workers about road safety	To share the experiences and best practices aimed at learning lessons and improving implementation of EMP
Contents	Module 1: Orientation • ADB Safeguards Policy Statement • Government of Bangladesh Environmental Laws and Regulations Module 2: Environmental Assessment Process • ADB environmental process, identification of impacts and mitigation measures, formulation of an environmental management plan (EMP), implementation, and monitoring requirements • Review of environmental assessment report to comply with ADB requirements • Incorporation of EMP into the project design and contracts	• Roles and responsibilities of officials/ contractors/ consultants towards protection of environment • Environmental issues during construction • Implementation of EMP • Monitoring of EMP implementation • Reporting requirements	Experiences on EMP implementation – issues and challenges Best practices followed
Duration	1 day	1 day	1 day on a regular period to be determined by PMU, PIUs, and PMSC

Items	Pre-construction/prior to construction	Construction	
Participants	LGED, PMU, and PMU staffs (technical and environmental) involved in the project implementation	PMU/ PIUs Contractors	PMU /PIUs Contractors

a. Institutional Arrangement

182. The Local Government Engineering Department (LGED) under the Local Government Division (LGD) of the Ministry of Local Government, Rural Development and Cooperatives (MLGRD&C) and having extensive experience in managing urban and road and drain subprojects financed by ADB, are the executing agencies of the project. The participating Pourashava are the implementing agencies.

b. Project Management Unit

183. A PMU has been established for the overall management of the project. The PMU is headed by Project Director (PD) supported by officials including two project managers in charge of (I) municipal infrastructure and governance improvement and capacity development (ii) water supply and sanitation. The PMU will receive support from Sr. environmental specialist and Sr. resettlement specialist on the MDSC team. Key tasks and responsibilities of the Sr. Assistant Engineer, PMU Safeguard (Environment) officer are as follows:

- Confirm existing IEEs/EMPs are updated based on detailed designs, and that new IEEs/EMPs are prepared in accordance with the EARF and sub-project selection criteria related to safeguards;
- Confirm whether IEEs/EMPs are included in bidding documents and civil works contracts;
- Provide oversight on environmental management aspects of subprojects and ensure EMPs are implemented by project implementation unit (PIU) and contractors;
- Site specific EMP 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 EMP;
- 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 monitoring and assessments as per the EARF;
- Review, monitor, and evaluate the effectiveness with which the EMPs are implemented and recommend necessary corrective actions to be taken as necessary;
- Consolidate monthly environmental monitoring reports from PIUs and submit semi-annual monitoring reports to ADB;

- Ensure timely disclosure of final IEEs/EMPs in locations and form accessible to the public; and
- Address any grievances brought about through the grievance redress mechanism in a timely manner.

c. Project Implementation Unit

184. The participating Pourashavas have established PIUs within the Pourashava structure. The PIUs will (I) be responsible for land acquisition; (ii) take necessary action for obtaining the proposed land free from encroachments, squatters, mobile vendors and hawkers if any; (iii) plan, implement and monitor public relations activities, gender mainstreaming initiatives and community participation activities at Pourashava level; (iv) disseminate information related to the project to the public and media; (v) ensure compliance with loan covenants concerning safeguards measures; and (vi) facilitate implementation of safeguards plans. The PIUs will each designate a Safeguard Officer and will receive assistance from the assigned MDSC regional environmental specialist to:
    - Update IEEs/EMPs during implementation stage and prepare new IEEs/EMPs in accordance with the EARF;
    - Conduct environmental compliance audit of existing facilities as per Item of ADB SPS, 2009;
    - Include IEEs/EMPs in bidding documents and civil works contracts;
    - Comply with all government rules and regulations;
    - Take necessary action for obtaining the proposed land free from encroachments, squatters, mobile vendors and hawkers if any;
    - Oversee implementation of EMPs including environmental monitoring by contractors;
    - Take corrective actions when necessary to ensure no environmental impacts;
    - Submit monthly environmental monitoring reports to PMU,
    - Conduct continuous public consultation and awareness;
    - Address any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs; and
    - Organize an induction course for the training of contractors preparing them on EMP implementation, environmental monitoring requirements related to mitigation measures; and taking immediate actions to remedy unexpected adverse impacts or ineffective mitigation measures found during the course of implementation.

d. Management Design and Supervision Consultants (MDSC)

185. MDSC has been engaged to work closely with and advise the PMU, to be involved in project supervision including monitoring during construction phase. The MDSC has one Environmental Specialist and two Regional Environmental Specialists as well as one Resettlement Specialist and two Regional Resettlement Specialists. The MDSC Environmental Specialist will, but not limited to:
    - Work under the general supervision of the team leader;
    - Review the environmental guidelines and requirement of the government of Bangladesh and ADB SPS, 2009, environmental sub-project selection guidelines and EARF;
    - Guide the implementation of future sub-projects;

- Provide technical support to the PMU and PIUs including review and update of EARF and guidelines for specific type of sub-projects and assist in preparing terms of reference for environmental assessment;
- Assist and guide the MDSC regional environmental specialists to provide support to environmental management functions including updating sub-project IEEs in respect to EMP;
- Assist in preparing IEEs and in monitoring impact and mitigation measures associated with subprojects;
- Assist PIUs and MDSC regional environmental specialists working in the steps for preparing the EIA/IEE, capacity building and training, preparation of guidelines and procedure and sub-project specific guidance;
- Provide support and guidance to PIUs in undertaking environmental monitoring
- Support PMU in submitting semi-annual environmental monitoring reports to ADB;
- Facilitate in grievance redress and corrective actions;
- Train PIU officials regarding environmental requirement and issues; and
- Perform any other task assigned by the team leader, deputy team leader and the project director.

186. The MDSC regional environmental specialists will, but not limited to:

- Work under the supervision and guidance of the team leader and MDSC Environmental Specialist;
- Assist PIUs in preparing and updating IEEs including EMPs in accordance with the EARF and assist in monitoring impact and mitigation measures associated with subprojects including implementation of EMPs by contractors;
- Assist in preparation of IEEs and in the environmental review of sub-project consisting of screening at Pourashava level by PIU through a committee formed with municipal mayor as chairman and representatives from DoE, LGED and other relevant district office as members;
- Assist PIUs in the steps for preparing EIA/IEE, capacity building and training, preparation of guidelines and procedure and sub-project specific guidance;
- Support PIU in environmental monitoring and submit monitoring reports to PMU as inputs into the semi-annual monitoring report submitted to ADB;
- Undertake mitigation measures and other specific measures in the construction contract;
- Facilitate in grievance redress and corrective actions;
- Follow sub-project selection guidelines and EARF to ensure compliance with the environmental guidelines and requirement of the Government of Bangladesh and ADB SPS, 2009;
- Support PMU safeguard officer and MDSC environment specialist by providing data, information and all other requested assistance;
- Train PIU officials regarding environmental issues
- Perform any other task assigned by MDSC environment specialist, team leader and the project director.

e. Civil Works Contracts and Contractors

187. EMPs are to be included in bidding and contract documents and verified by the PIUs and PMU. The contractor will be required to designate an environmental supervisor to (i) coordinate with MDSC on updating the IEE/EMP based on detailed designs, and (ii) ensure implementation of EMP during civil works. Contractors are to carry out all environmental mitigation and monitoring plans outlined in their contract Table 14.

f. GICDC

188. The PMU and PIUs will require support on a range of activities related to governance improvement and capacity development of Pourashavas. The GICDC will support PMU and PIUs in implementing urban government improvement action plan (UGIAP) by providing capacity development, community mobilization and other facilitation services. There are 4 GICDC regional offices consisting of 4 regional coordinators at each regional office. There are 2 Local Capacity Development Associates (Community Mobilization and Municipal Finance) in each project Pourashava. The regional coordinators are assisting the Pourashavas and the LCDAs in the activities related to community participation and inclusive development. The community mobilizers have been posted at the Pourashava and (i) are working maintaining close liaison with the mayor, councilors, Pourashava staffs and communities, (ii) providing assistance and support to PIU regarding planning and implementation of citizen awareness and participation activities, urban planning, equity and inclusiveness of women and urban poor. The GICDC also have a training specialist who is responsible for identifying and coordinating capacity building activities at Pourashava level Figure VIII-1.

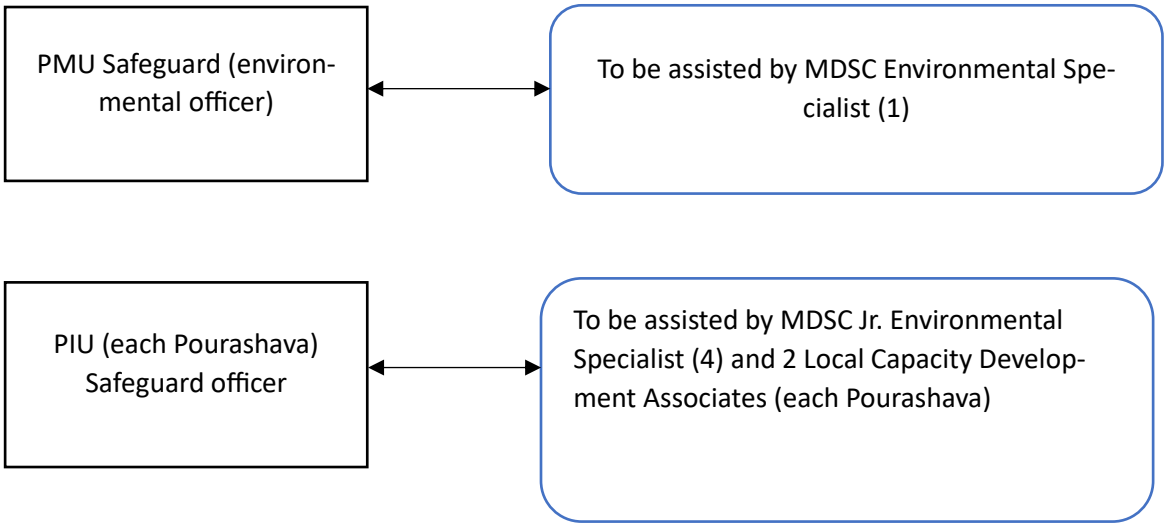


Figure VIII-1: Safeguards Implementation Arrangement

g. Staffing Requirement

189. Costs required for implementing the EMP will cover the following activities:
    - Updating IEE, preparing and submitting reports and public consultation and disclosure;
    - Application for environmental clearances and;
    - Implementation of EMP, environmental monitoring program and long-term surveys.
190. The infrastructure involved in each scheme is generally straightforward and will take between three and nine months to build. Environmental monitoring during construction will also be straightforward and will involve periodic site observations and interviews with workers and others, plus checks of reports and other documents. This will be conducted by MDSC environmental specialist assisted by the PMU environment officer (Sr. Assistant Engineer). Therefore, no separate budget required for MDSC environment specialist.
191. The operation phase mitigation measures are again of good operating practices, which will be the responsibility of Bhanga Pourashava. All monitoring during the operation and maintenance phase will be conducted by LGED therefore, there are no additional costs.

E. Budget for EMP

192. 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.

Mitigation that is the responsibility of PIU and contractors will be provided as part of their management of the sub-project. The cost estimation for Environmental Mitigation Measures and Monitoring is given in the Table 17. The total mitigation and monitoring cost for the project is calculated as **BDT 5,84,500/-.**

193. in addition to compliance to the clauses 27, 28 and 29 of GCC of tender documents and IEE to the entire satisfaction of E-I-C.

Table VIII-4: EMP in Bidding Document

EMP Task No.	Mitigation and Monitoring Items	Unit	Cost/Unit	Total Unit	Total Cost
1.0	**Pre-construction Period**				
1.1	Obtaining of SSC/NOCs	Included in Project Preparation Cost			0
1.2	Updating of EMP	Included in Project Preparation Cost			
1.3	Existing Utilities	Included in Engineering Cost			
1.4	Construction Camps, & Stock Yards	Included in Engineering Cost			
1.5	Sources of Materials	Included in Engineering Cost			
1.6	EMP Implementation Training	No.	30000	1	30000
1.7	Environmental Quality Test-Baseline				
	Air Quality Test (BP-R-005, 006)	No.	35000	1	35000
	Noise Level Measurement (BP-R-007)	No.	5000	1	5000
	Soil Quality Test (BP-R-005, 006)	No.	25000	1	25000
	Groundwater Quality Test (Camp Site)	No.	10000	1	10000
2.0	**Construction Period**				
2.1	Topography, Landforms, and Geology	Monitoring by Contractor			0
2.2	Soil Quality	No.	25000	2	50000
2.3	Groundwater Quality	No.	10000	2	20000
2.4	Air Quality	No.	35000	2	70000
2.5	Noise & Vibration	No.	5000	2	10000
2.6	Waste Pollution	Monitoring by Contractor			0
2.7	Aesthetics				
2.8	Biodiversity	Monitoring by Contractor			0
2.9	Traffic Congestion	Monitoring by Contractor			0
2.10	Socio-economic Status	Monitoring by Contractor			0
2.11	Community Health and Safety	Lump-sum			100000
2.12	Workers Health and Safety	Lump-sum			150000
2.13	Post-construction Clean-up	Lump-sum			20000
2.14	Submission of EMP Implementation Report	No.	10000	1	10000
	Other Expenses during Construction Period				
	Tree Plantation (BP-R-005 and BP-R-013)	No.	90	550	49500
3.0	**Operation Period**				
3.1	Air Quality	Pourashava O&M Budget			0
3.2	Noise Level	Pourashava O&M Budget			0
3.3	Surface/Waste Water Quality	Pourashava O&M Budget			0
3.4	Health & Safety	Pourashava O&M Budget			0
3.5	Waste Management	Pourashava O&M Budget			0
3.6	Road Accident	Pourashava O&M Budget			0
	Grand Total:				**584500**

***Note**: Cost of the EMP items should be as fixed budget*

IX. MONITORING AND REPORTING

194. PMU will monitor and measure the progress of EMP implementation. The monitoring activities will correspond with the project's risks and impacts, and will be identified in the IEE for the sub-project components. In addition to recording information on the work and deviation of work components from original scope PMU, PIUs, and MDSC will undertake site inspections and document review to verify compliance with the EMP and progress toward the final outcome. Corrective actions to be taken quickly and reported in monitoring reports.
195. Contractor shall submit monthly Environmental Monitoring Report covering the mitigation measures listed in this EMP for all the sub-project components to the MDSC for approval.
196. MDSC 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 ADB. The suggested monitoring report format is in ADB. Sub-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.
197. LGED will document monitoring results, identify the necessary corrective actions, reflect them in a corrective action plan and for each quarter, will study the compliance with the action plan developed in the previous quarter. Compliance with loan covenants will be screened by ADB.
198. ADB will review project performance against the commitments as agreed in the legal documents. The extent of ADB 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. ADB will monitor projects on an ongoing basis until a project completion report is issued. ADB 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 ADB safeguard specialists/officers or consultants for projects with significant adverse social or environmental impacts;
    iii. Review the periodic monitoring reports submitted by EAs to ensure that adverse impacts and risks are mitigated, as planned and as agreed with ADB;
    iv. Work with EAs 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.

The process described in this document has assessed the environmental impacts of all elements of Bhanga Pourashava Road and drain sub-project. All potential impacts were identified in relation to design and location, construction, and operation phases.

X. CONCLUSION AND RECOMMENDATIONS

199. Planning standards and plan contemplations have been evaluated and integrated into the site arranging process whenever the situation allows. Primer plans coordinate various measures, both primary and non-underlying, to standard environment strength into the sub-project. In this manner, ecological effects as being because of the venture plan or area were not huge. The greater part of the singular components of the sub-project are moderately little and include direct development and activity, so effects will be primarily limited and not extraordinarily critical. The greater part of the anticipated effects is related with the development interaction, and are delivered on the grounds that that cycle is obtrusive, including digging and other uncovering. Nonetheless, the normal idea of the effects implies that most can be effectively relieved. In the functional stage, all offices and framework will work with routine upkeep, which shouldn't influence the climate. Offices should be fixed now and again, yet ecological effects will be substantially less than those of the development time frame as the work will be rare, influencing little regions as it were.
200. Mitigation measures have been developed to reduce all negative impacts to acceptable levels. Mitigation will be assured by a program of environmental monitoring to ensure that all measures are implemented, and will determine whether the environment is protected as intended. It will include observations on- and off-site, document checks, and interviews with workers and beneficiaries. Any requirements for corrective action will be reported to the ADB.
201. The stakeholders were involved in developing the IEE through discussions on-site and public consultation, after which views expressed were incorporated into the IEE and in the planning and development of the sub-project. The IEE will be made available at public locations in the city and will be disclosed to a wider audience via the ADB and LGED websites. 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 to ensure any public grievances are addressed quickly.
202. The PMU and MDSC will be responsible for monitoring. The MDSC will submit monthly monitoring reports to PMU, and the PMU will send semi-annual monitoring reports to ADB. ADB will post the environmental monitoring reports on its website.
203. The EMP will assist the PMU, MDSC, and contractors in mitigating the environmental impacts and guide them in the environmentally sound execution of the proposed sub-project. The EMP will also ensure efficient lines of communication between the implementing agency, project management unit, and contractors. A copy of the EMP shall be kept on-site during the construction period at all times. The EMP shall 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 shall constitute a failure in compliance.
204. The citizens of Bhanga Pourashava will be the major beneficiaries of this sub-project. The improved roads will provide a more efficient and effective transport route, which should improve the overall economy by reducing time spent idle in traffic by delivery vehicles, employees and customers.
205. Therefore, the proposed sub-project is unlikely to cause significant adverse impacts and net environmental benefits to citizens of Bhanga Pourashava will be positive. The potential impacts that are associated with design, construction, and operation can be mitigated to standard levels without difficulty through proper engineering design and the incorporation or application of recommended mitigation measures and procedures.

206. Based on the findings of the IEE, there are no significant impacts and the classification of the sub-project as Category “B” is confirmed. No further special study or detailed environmental impact assessment (EIA) needs to be undertaken to comply with ADB. All required issues have been assessed to the best of our knowledge and no further studies are required to comply with ADB procedures or the laws of GoB.

APPENDICES

Appendix 1: Environmental Screening and Categorization Form

Roads:

Country/ Project No./ Project Title		**Improving Urban Governance and Infrastructure Program (IUGIP)**
Subproject title		**Urban transport road and drainage improvement RBS sub-project**
Project Executing Agency		**LGED, Dhaka**
Project Implementing Agency		**Bhanga Pourashava**
Modality		**RBL progress**
Is Project eligible for funding under the RBL Program? [√] Yes [ ] No *(Ref DOE of ECR 2023)*		
Environment Impact categorization [√] New [ ] Re categorization – Previous Category [ ]		
[ ] **Category A** (Cat A - Not eligible for funding under the RBL)		
[√] **Category B** [ ] **Category C**		
(Ref Checklist- Rapid Environmental Assessment (REA) checklists)		
Updated by: Ahsan Imam, Jr. Environmental Specialist		
Environmental Specialist (Name, title, signature): Date;		
For Project Executing Agency / PMU (Name, title, signature):		

Checklist 1 - Project Exclusion Screening Checklist for Environmental Safeguards

The following checklist shall be completed before inclusion of any activity/subproject in the RBL program. If Answer to any of the mentioned criteria is 'Yes' then such activity/subproject will not be eligible and shall be excluded from the RBL program.

Questions		Response		Remarks /Clarifications
		Yes	No	
1.	**Type and Nature of Subproject**			
1.1	Proposed activity / subproject classified under the Red Category per ECR 2023?		√	Complied the ECR 2023 for classification
1.2	Proposed activity / subproject includes components involving prohibited investment activities per ADB SPS?		√	Complied REA for prohibited list
2.	**Location of Proposed Subproject**		√	
2.1	Proposed activity/subproject located in ecologically sensitive areas such as protected areas (national parks, wildlife sanctuaries), notified wetlands or wetlands of significant value, critical habitats?		√	
2.2	Proposed activity/subproject located in world heritage sites, and/or within 250 m from the core zone of outer boundary of the world heritage area		√	
2.3	Proposed activity located within monuments/sites protected by Department of Archeology, Government of Bangladesh?		√	
3.	**Potential impacts**			
3.1	Proposed activity/subproject may significantly impact mangroves, wetlands, estuaries, buffer zones of protected Areas etc.?		√	
3.2	Proposed activity/subproject may potentially lead to encroachment/damage of physical cultural resources with significant value and/or places recognized by government agencies (e.g., Department of Archeology), which may include places of worship, cultural heritage sites, graves/cemeteries,		√	

	historical monuments, etc.			
3.3	Proposed activity/subproject likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented, and may affect an area larger than the sites or facilities subject to physical works (i.e., category A projects as per ADB SPS 2009)		√	

REA check list

Instructions:

. The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Project Management Unit, for endorsement by the Environmental Officer of PMU and for approval by the Project Director

i. This checklist focuses on environmental issues and concerns

ii. 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

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area adjacent to or within any of the following environmentally sensitive areas?		√	There are no buildings of archaeological and cultural heritage importance close to the sub-project.
• Cultural heritage site		√	There is no protected area at the proposed site
• Protected Area		√	There is no wetland area at the proposed site
• Wetland		√	Not Applicable
• Mangrove		√	Not Applicable
• Estuarine		√	Not Applicable
• Buffer zone of protected area		√	There is no special protected area for bi-
• Special area for protecting biodiversity		√	There are no buildings of archaeological and cultural heritage importance close to the sub-project.
B. Potential Environmental Impacts Will the Project cause			
▪ encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?		√	
▪ encroachment on precious ecology (e.g. sensitive or protected ar-		√	
▪ 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?		√	Construction contractors will be required to provide sanitation facilities and ensure proper waste management at all times. **Hence this is not applicable, local people's will be construction site**
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation during project construction and opera-		√	The environmental impact related to the construction will be minor in nature and mostly limited to the duration of con-
▪ noise and vibration due to blasting and other civil works?	√		
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples, or other vulnerable groups?		√	

Screening Questions	Yes	No	Remarks
▪ other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory prob-		√	
▪ hazardous driving conditions where construction interferes with pre-			
▪ 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?		√	
▪ creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents?		√	
▪ accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials?		√	
▪ increased noise and air pollution resulting from traffic volume?	√		Short time at during construction period
▪ increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?		√	
▪ social conflicts if workers from other regions or countries are hired?		√	
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		√	
▪ 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?		√	The environmental impacts related to the construction of the project will be minor in nature and mostly limited to the duration of construction
▪ 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 con-		√	

Appendix 2: Waste Management Plan (Construction Period)

1. General

Considerable quantities of wastes (general & construction) will be generated due to the 1-year construction of the sub-project components. Two types of wastes will be generated during construction:

a. General Waste:
   - Organic waste (foods, fruits, tree leaves etc.); and
   - Inorganic (such as papers, plastic and glass bottles & containers, polythene etc.); and

b. Construction Waste:
   - Construction wastes are: construction materials such as sand, piece of rocks, bricks, rods, bamboo, wood, geotextiles, remaining concrete & bentonite waste.

2. Objectives

The main objective of the WMP is to organize disposal of all wastes generated during construction in an environmentally acceptable manner specially consider the following:

- Health hazards of the project personnel as well as community people should not be occurred;
- Manage the wastes in such a way that environment (specially air, soil, water etc.,) will not be polluted;
- Odor means bad smell should not be generated;
- Always friendly environment at the construction sites and construction camps;
- Any waste should not be disposed into the river and any water bodies to avoid water pollution;
- Any waste should not be burnt; and
- Any waste should not be placed in earth holes/chambers.

3. Potential Environmental Impacts

- Major potential environmental impacts due to the lack of waste management are:
- All types of environmental pollutions such as air, soils, water (surface & ground) pollutions;
- Generation of odor;
- Increase of flies, mosquitoes, insects etc.,
- Health hazards; and
- Environmental nuisance at the project sites

4. Strategies to Adopt

The following strategies need to be adopted for appropriate soil waste collection system to be functioned properly:

- Setting waste collection bins (not permanent structure, movable high-quality movable plastic bins; See Figure 1) in strategic points of the construction camp and work sites.
- Introduce solid waste bins for organic and non-organic waste.
- Coordinate with the municipalities waste collection system so that the waste can be collected at midnight when the road transports are minimum.
- Wash liquids need to be drained out though the functioning drains. The liquid waste needs to be treated with bleaching power every evening before draining so that the waste water cannot create nuisance and local pollution.
- The other strategies that might be adopted are explained in later paragraphs.

Figure 1: High quality plastic bins for solid waste

Table 1: Mitigation Measures

Aspect	Waste Type	Mitigation Measures	Proposed Re-use/Recycling/ Disposal
site clearing/disposal of debris	• Vegetation (logs, mulched timber, weeds) • Demolition of existing building	• Due care should be taken during site clearance and disposal of debris during demolition of existing building. • The waste should be stored at site ensuring that existing water bodies, road and drains within or adjacent to the site are kept safe and free and no blocking of drains • Prior clearance will be taken from concerned Govt. Authorities or landowner	Recycling/Disposal whereas applicable or where suitable and approved by PIU
Construction site waste	• Plastics, Concrete and • Timber/Steel formwork • Packaging Materials, papers • Empty containers and other drums • Metals and electrical cabling	• The waste should be stored at PIU suggested location ensuring that existing water bodies, road and drains within or adjacent to the site are kept safe and free and no blocking of drains • Construction waste will be connected to dispose in Pourashava existing/proposed waste management system	Recycling/Disposal/ Re-use
Construction camp	• Waste generated by food, papers, weir, wood, polythene and empty packets • Labor camp waste generated by workers	• It will be made mandatory for waste to be segregated right at the source of waste generation • The waste should be stored at construction camp in separate dustbin • labor camp waste will be connected to dispose in Pourashava existing/proposed waste management system	Re-use/ Recycling/Disposal whereas applicable
Traffic movement with waste	• Waste generated from construction site/labor camp	• Ensure covered the waste during Traffic movement • Adequate traffic control signals and barriers should be used in case traffic is to be diverted during debris disposal. All efforts should be made to ensure avoidance of traffic jam, which otherwise results in air pollution, noise pollution and public unrest.	Disposal

5. Method of Disposal of Wastes

The Contractor will collect the general wastes in separate waste bin at sources (means organic waste in one bin & inorganic waste in another bin) and dumped at the designated waste disposal site. The contractor will construct concrete waste disposal site; means concrete floor and wall and covered by shed to avoid, air, bad smell, soil and ground water pollutions. Based on the quantity of general waste (organic & inorganic waste), the following two chambers (rooms) of the concrete disposal site will be constructed by Contractor:

Just after filling one chamber (say after 6 months) by organic waste through pocket gate, it should be covered by earth (soils) properly & keeps it for about 6 months for converting organic fertilizer for the agricultural lands. After filling 1st chamber by organic waste, disposing of waste will be started for 2nd chamber.

The inorganic waste will be collected in the waste collection bins. Just after filling, these inorganic wastes can be given to the vender free of cost.

The Contractor will collect construction waste as mentioned above separately and dump in to the designated room at the construction camp. Just after filling the room, Contractor will sale these waste to the vender for re-cyclic.

The Contractor will maintain log book for the measurement of quantity of the wastes (especially hazardous wastes) disposed every day.

6. Institutional Arrangement

Contractor is mainly responsible for design, construction, maintenance as well as environmental monitoring for the disposal of waste. Environmental Specialist of the MDSC is responsible for monitoring of the disposal. The PIU of the Municipality will setup a 'Waste Management Committee' with the representatives of the MDSC and contractor to effectively disposing the wastes and distribution of organic fertilizer to the farmers and inorganic wastes to the venders. The committee is also responsible for monitoring procedure for the collection and carrying of wastes without causing any environmental hazards.

Appendix 3: Sample Site Specific EMP of Road and Drain sub-project

Sl. No.	Activity	Management Measures	Action By	When
01	Preparation & mobilization of field office	• A detailed plan and drawing of the semi-pucca site office (Area: 50 sq. m.) with the arrangement of sufficient natural light, fan, toilet, safe drinking water, hit protecting ceiling, damp proofing equipment, and so on will be developed & submitted to the Pourashava before beginning the construction work.	Contractor	Before the construction
02	Camp for the workers,	• Camp for the workers will provide properly. Adequate disposal of sanitary waste will be considered in order to follow best waste management practices. Basic hygiene and cleanliness in the worker cam. In particular, usable toilet facilities separate Male & Female, Kitchen waste collection & dumping will be exist & well-maintained with basic provision of soak pits & septic tanks. Safe drinking water will be provided to the workers. Fire extinguisher would be provided, First Aid Box with Doctor's Name, Mobile number & necessary emergency Ambulance number.	Contractor	Before the construction
03	Storing construction material	• Well-defined area for storage with suitable containment, proper labelling of different items, and determines locations prior to award of contract will be ensured.	Contractor	Before the construction

Sl. No.	Activity	Management Measures	Action By	When
04	Worker safety & security	• Provision of personal protection equipment (PPE) such as helmets, safety shoes & glass, gloves, and face masks, safety sign for the workers; provision of first aid box with basic apparatus will be available. (Bangladesh Labour Law of 2006, Bangladesh labor service rules 2015 and all applicable laws and standards on workers H & S.),	Contractor	During the construction
06	Safe drinking water	• Tube well is the source of drinking water in this area. Thus, tube well water will be provided to labors for drinking & other purposes. Water quality is good in this area, water quality will be monitor when necessary.	Contractor	During the construction
07	Excavation/ cutting, filling and clearing of proposed sub-project	• During excavating / cleaning work of the safety measures will be taken by the construction crew wearing protective clothing, shoes, gloves and face masks. Collected earth and sand will be covered during transportation.	Contractor	During the construction
08	Dust & cleaning	• Regular sprinkling of water in the vicinity of the construction site is necessary so that dust is not re-suspended. Frequency of the sprinkling to be three (3 or 4) times a day or more based on the extent of activity and dryness of the season; Cleaning will be done in a manner that it does not generate or re-suspend dust.	Contractor	During the construction
09	Cutting/digging of proposed schemes	• Proper notification will be provided to the public surrounding the construction site. A notice board informing the proposed work should be erected two weeks prior to actual work. An alternative road/detour route will be ensured for temporary passing the people, rickshaw, van, car private etc.	Contractor	During the construction
10	Tree-cutting & safeguarding	• Compensatory tree plantation in the ratio of 2 trees planted for each tree that had to be cut due to construction activities; • Any tree saved from cutting will be barricaded and protected.	PIU & Contractor	During the construction
11	Debris management	• Well-defined onsite area for storing of any debris generated; transporting debris with proper coverage; Disposal in an approved dump yard / landfill will be ensured.	Contractor	During the construction
12	Safety measures	• Protection of traffic at all times along the existing sub-project, necessary barricades, warning lights & guide signs etc. will be ensured.	Contractor	During the construction
13	Other existing amenities for community welfare	• Safety signage at all sites visible to public will be provided. • Safety barriers near any trenches, and cover trenches with planks during non-work hours will be provided. • If construction work is expected to disrupt users of community water bodies, notice to the affected community shall be served 7 days in advance and again 1 day prior to start of construction. • Properties and utilities will be restored or compensated to pre-work conditions if any damage occurred.	Contractor	During the construction
14	Transporting construction material	• Transporting with adequate safety precautions, (e.g., not to use undersized trucks) as well as adequate covering of trucks that are used to transport material to and from the construction site will be maintained properly.	Contractor	During the construction

Sl. No.	Activity	Management Measures	Action By	When
15	Air quality	• Damp down exposed soil and any sand stockpiled on site by spraying with water when necessary, during dry weather will be accelerated; • Use tarpaulins to cover soils, sand and other loose material when transported by trucks will be ensured. • And hot-mix plants, batching plants and crushers 350.00m will be situated far from residence.	Contractor	During the construction
16	Noise	• Use of ear plugs / muffs by all construction workers during operation of heavy equipment/ machinery will be ensured. • Wherever feasible, noise absorption padding / enclosures will be used surrounding the noise-generating machinery.	Contractor	During the construction
17	Public awareness campaign	• Public awareness events will be held before and during construction work. This awareness campaign may be done through miking, deployment of the watchmen, sticking/hanging posters, banners and sign board (size: 1.2mx0.9m Plane CI Sheet) near the construction site.	PIU & Contractor	During the construction
18	Pedestrian & traffic safety	• Extensive barricades of the construction zone will be provided so that pedestrians do not come into direct contact with the machines, tools, material and other accessories; • Provision of barricading will be done so that these do not create traffic safety problems. Supplementary aids / tools such as signboards, reflectors and night lighting will be used to avoid possible accidents.	Contractor	During the construction
19	Existing utilities	• Preparation of Soils management plan and traffic management plan will strongly be maintained.	Contractor	During the construction

**Site specific EMP will be ensured from contactor before start of the construction work

Appendix 4: Health Safety Manual of Construction Workers

Parameters/issues	Workplace Hazards	Suggested PPE
Eye and Face protection	Flying particles, molten metal, liquid fuel, gases or vapors, light radiation.	Safety glasses with side-shields, protective shades, etc.
Head Protection	Falling objects, inadequate height clearance, and overhead power cords.	Helmets with top and side impact protection.
Hearing protection	Noise, ultra-sound.	Hearing protectors (ear plugs of ear muffs.)
Foot Protection	Falling or rolling objects, pointed objects. Corrosive or hot liquids.	Safety shoes and boots for protection against moving & falling objects, liquids and fuels.
Hand Protection	Hazardous materials, cuts or lacerations, vibrations, extreme temperatures.	Gloves made of rubber or synthetic materials (Neoprene), leather, steel, insulating materials, etc.
Respiratory Protection	Dust, vapors.	Facemasks with appropriate filters for dust removal and air purification spray, mists, vapors and gases). Single or multi-gas personal monitors, if available.
	Oxygen deficiency	Portable or supplied air (fixed lines.) on site rescue equipment.
Body/leg Protection	Extreme temperatures, hazardous materials, biological agents, cutting and laceration.	Insulating clothing, body suits, aprons etc. of appropriate materials.

Appendix 5: Consultation workshop Participant List

Participants List of Consultation Meetings at Ward 3, Bhanga Pourashava, Laxmipur District.

Urban Governance and Infrastructure Improvement Programme (UGIIP), LGED

Project Readiness Services

Public Consultation Meeting for Social and Environmental Safeguards

Name of the Pourashava: Bhanga

Name of Location: Now Para Ward No 02

Visit/ Meeting Date: 02/11/2022 Time: 3.45 pm

List of Participants

Serial (ক্রমিক)	Name (নাম)	Address/ Contact No (ঠিকানা,মোবাইল)	Age (বয়স)	Occupation (পেশা)	Signature (স্বাক্ষর)
১	ADV Zahurul Haque	01711038437	46	Councilor	[signature]
২	Mirza Kamal	01712573619	65	Farmer	[signature]
৩	Asaduzzaman	01712066644	41	Business	[signature]
৪	Ibrahim Munshi	0171222882 89	60	Farmer	[signature]
৫	Mirza Rabiul	01787467415	58	Business	[signature]
৬	Mirza Rabbi	01764620593	29	"	[signature]
৭	Shekh Afsar	01740231564	52	Farmer	[signature]
৮	Shahin Munshi	0177255533 23	38	Business	শাহিন
৯	Muslemuddin	01752086684	48	Electrician	[signature]
১০	Tutul Shekh	01766748429	35	Business	Tutul
১১	Alamgir Shardar	01751611012	27	Farmer	আলমগীর
১২	Hobi Mollah	01746414013	39	Business	[signature]
১৩	Mohiuddin Munshi	0173136 8266	55	"	[signature]
১৪	Gulzar Mollah	01719762534	68	Farmer	[signature]
১৫	Siddik Mollah	0186956605 21	70	—	[signature]

16. Mirza Mannu = 01832748152 - 60 - Farmer - [signature]
17. Mirza K Zaman = 01849553744 - 40 - Business - K Zaman

Appendix 6: SOP for Oil & Chemical Handling

1. Aim and Scope

The objective of this SOP is to specify detailed rules, times and responsibilities related to the use, storage and handling of oils and chemicals (hereunder referred to as “chemicals”) within working areas by the Contractor.

This document is to be given by the PIU Responsible person to the Contractor when the contract becomes effective. The Responsible Engineer shall ensure that the Contractor has clearly understood these good practices for chemical handling and shall abide by them.

2. Responsibilities

- Contractor personnel responsible for the task
- Coordinate and ensures that the Contractor is working in accordance with this SOP
- Ensures that personnel assigned to handle and transport chemicals are properly trained and equipped to handle chemicals safely, and prepared to contain and clean accidental spills
- Ensures that chemicals are labelled and placed in designated location according to this SOP
- Provides Safety Data Sheet of the chemicals to be used to the responsible person
- Carry out handling of chemicals from one location to another
- Responsible for regular checks required in the implementation of this SOP

3. Operative Rules

The responsible person of Contractor is to ensure that the SOP is following as per the requirement. This procedure also defines the training requirements, handling methods and precautions to be taken during transportation of chemicals from one site to another, in order to minimize any hazards these chemicals might pose to human beings as well as to the environment.

Chemicals handling planning

- The person planning the transfer of chemicals must be informed of quantities to be transferred, the type of packaging and the scheduled locations when assessing the methods and means necessary for the handling.
- The person in charge of the transfer and/or handling of chemicals must:
    - Clearly identify the chemical and be aware of the hazards involved.
    - Ensure that the chemicals being sanctioned for transfer are stored and stacked in a correct and safe manner as detailed in the subsequent clauses of this SOP to avoid accidental spills and possible injuries.
- The Contractor must provide his personnel with the Personal Protective Equipment (PPE), adequate means of transportation and spill control materials.

General safety requirements

- When a hazardous chemical is handled, the following recommendations should be observed:
- The Contractor must ensure that his personnel are trained in chemical handling and spill management.
- The Contractor must ensure that adequate manpower is assigned to the task in order to carry out the job safely.
- The Contractor has to ensure that the competent personnel are provided with the appropriate PPE.
- Adequate materials should be readily available for spill management and the action to be taken in case of Oil and/or Chemical Spills should include:
    - Use of appropriate PPE
    - Ensure that the necessary spill kit material is handy and used Isolate source
    - Inform responsible person so he can inform the required personnel so that the spill can be contained with minor consequences.
    - Contain spill as far as possible, especially if it can go into the road or drains
    - Inform the responsible person if the spill is in the road and can cause a hazard to traffic such that he can place warning signs and advice Police to assist controlling traffic, if necessary
    - Recover spill using suitable means:
        i. Bucket & shovel / dustpan work well on smooth floors
        ii. Absorbent pads which can each absorb (approx.) 1 litre
        iii. Sand or other oil absorbing particulates
    - Recovered chemical and absorbent material is to be dealt with as “hazardous waste”.

Chemicals Usage

When using chemicals on work premises, the Contractor has to ensure that the following rules/recommendations apply:

- Wherever possible, chemicals and their compounds used shall be free from Mercury, Chromium and Zinc.
- Use CFC and HCFC-free sprays and products.
- All chemicals used are to be accompanied by the “Safety Data Sheet (SDS)”.
- Wherever possible, the use of toxic and very toxic substances as well as carcinogenic substances shall be avoided.
- The Contractor should ensure that any chemicals used within work premises are not stored in a damaged container/drum and that they are labelled properly.

Labelling and identifying chemicals

The Contractor should ensure that:

- All bunded areas and basins, vessels, drums or cans and pipelines containing hazardous chemicals shall be properly labelled. The label/s shall not be removed and should be replaced if damaged or faded.
- In case the container or packaging needs to be changed or substances are to be transferred to a smaller container for safer handling, the Contractor must fix a label to the new container. It must be ensured that the label is firmly affixed to the container or alternatively, the name of the hazardous chemical, as indicated in the original label, is to be clearly written directly onto the new container. Apart from the chemical name, the common name of the chemical is also to be written on the container to ensure that the container's content is easily understood by the personnel who will be using it. Moreover, each container should depict pictograms to indicate constituent chemical properties.
- When reusing a container, it must be ensured that the original label on the old container is removed to eliminate any possibility of incorrect use of the chemical.
- When identifying containers, cans, etc. of chemicals, it must be ensured that a permanent marker is used and text is written clearly (preferably in block letters) and in an adequate font size to allow for easy identification.

Handling chemicals

All Contractor personnel handling chemicals should adhere to the following rules and recommendations:

- Handler/end user should be trained in chemical handling prior any handling
- Use of PPE is mandatory
- The specific SDS of the chemicals are always to be consulted prior to the handling of a chemical
- Chemical SDSs for each chemical being used, and safety and environmental information shall be available on site where the chemicals are being used
- Mixing or pouring of chemicals should be performed on waterproof surfaces to prevent soil contamination
- Handling of hazardous chemicals (transportation, change of containers, etc.) should always be kept to a minimum
- Chemical containers are not to be left open and are always to be kept closed when not in use
- Mixing of hazardous chemicals should be avoided since mixing of incompatible chemicals can induce emissions of toxic gases and other dangerous reactions
- The right amount of product is to be used (check product instructions to dilute chemicals)
- Hazardous chemicals are never to be left unattended

Storage of chemicals

If any chemicals are to be stored on work premises for the duration of works, the Contractor must ensure that the following rules are put into practice:

- It should be verified that all legal limits related to chemical storage are being met.
- Storage areas for the chemicals are to be defined.

- All dangerous chemicals must be located in the appropriate storage area unless currently in use.
- Storage areas should always be bunded and covered to avoid leaching of pollutants through rainwater.
- The capacity of the chemical storage basin or containment should always be the greater
- Any spill occurring within the bunded storage area shall be isolated from the drainage and sewage systems.
- It must be ensured that the capacity and characteristics of storage areas, shelves and any other device used to store chemicals are adequate for the specific operation.
- Good housekeeping must be ensured in storage areas
- Chemicals cannot be stored and/or located in areas such as passageways, vehicles, and so on.
- It must be ensured that incompatible chemicals are segregated within the storage areas.
- Chemical products must be stored according to their compatibility. Acids are to be stored away from bases (such as Alkalis). Flammable products are to be stored away from all other products and especially away from potential fire hazards.
- Storage areas for explosives shall be designed in such a way as to prevent hits, falls or any other potential cause of explosion and to protect the surroundings against explosions. Chemicals should ideally not be stored under direct sunlight, in warm areas or near heat sources.
- When storing chemicals, the label and SDS are to be consulted for correct storage of each substance.
- Certain chemicals or substances have to be stored in well-ventilated areas or at a specific humidity and temperature.
- It must be ensured that all containers such as drums and their lids are in good condition, are safe to use and there is no possibility for spills or leakages.

Control and monitoring activities

The Contractor has the responsibility to:

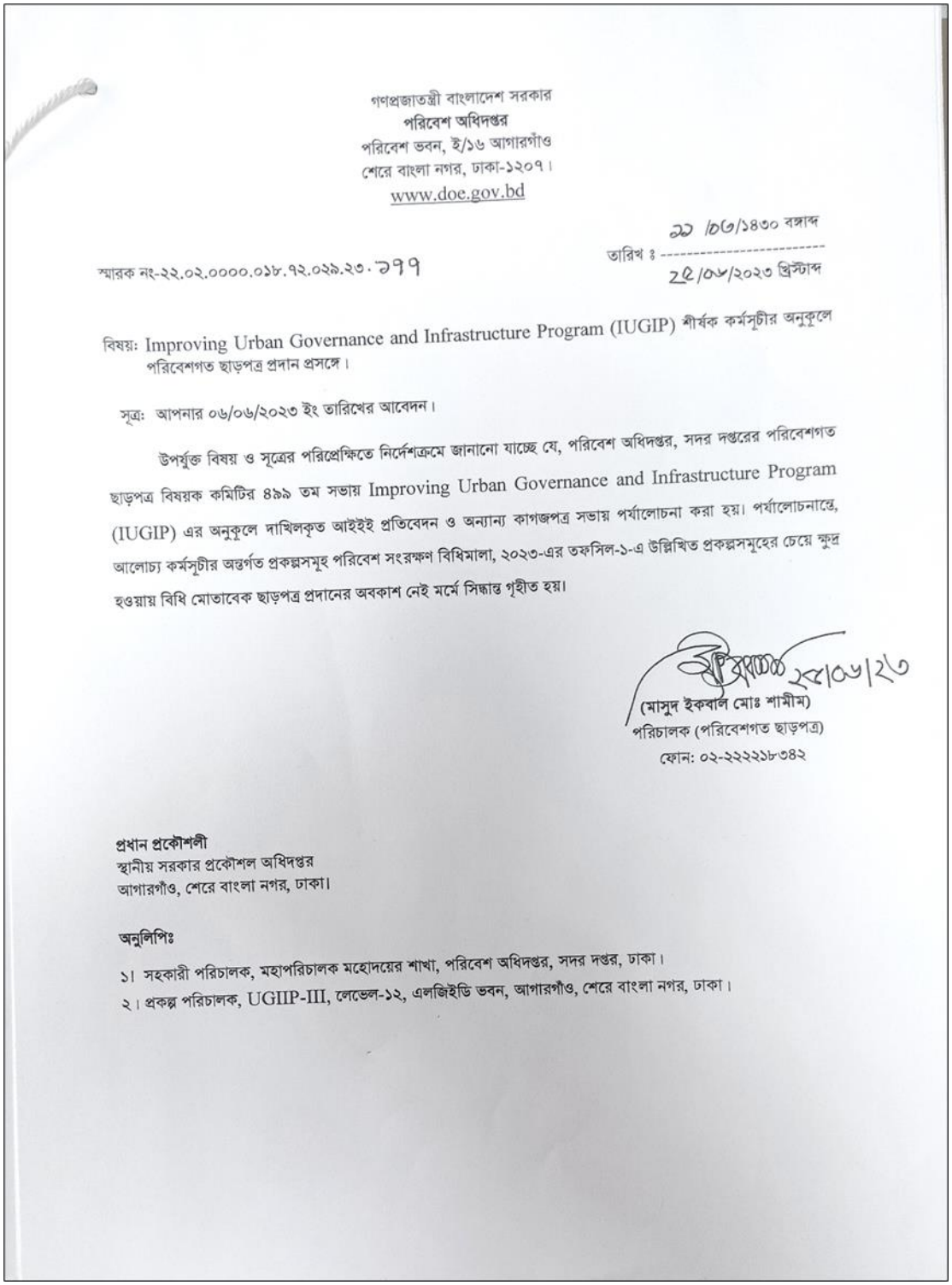
- Check periodically for correct identification, handling, use and storage of process chemicals at point-of-use;
- Check periodically that all waterproof areas where chemicals are located are in good
- condition and that there are no surface irregularities or cracks. This is especially important for storage of large containers;
- Check periodically for spills and leaks;
- Check periodically on the correct use of products by his personnel and give adequate training if deemed necessary.
- Visual checks shall suffice.

Abnormal conditions and emergency situations

In case of an accident or emergency such as spills, dangerous chemical reactions, etc., the Contractor shall ensure that the following recommendations are followed:

- Necessary safety protection devices (gloves, glasses, etc.) are to be worn
- The hazardous chemical causing the problem is to be identified
- If the level of risk is acceptable, all valves are to be isolated and taps turned off in order to stop the spill from spreading further out in the accident area as well as to contain the spill as much as possible and stop it from reaching unprotected areas, such as areas which are not waterproof, sewage discharges, etc.;
- The Responsible Person is to be informed so as to intervene;
- The accident area is to be cordoned off;
- Given that the danger level is acceptable, appropriate materials are to be used to clean up the spill. Rags, sawdust or other combustible materials are not to be used to collect combustible agents or flammable chemicals;
- Access to the area is only to be allowed when the spill has been contained, cleaned and the area is risk free.
- In case of damage to a container, this is to be replaced and it must be ensured that the container is clearly and correctly identifiable and disposed of in the appropriate manner.
- Proper absorbent materials should always be readily available for use close to all chemical storage and handling areas.

Appendix 7: Environmental Clearance Certificate



গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
পরিবেশ অধিদপ্তর
পরিবেশ ভবন, ই/১৬ আগারগাঁও
শেরে বাংলা নগর, ঢাকা-১২০৭।
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স্মারক নং-২২.০২.০০০০.০১৮.৭২.০২৯.২৩.৩৭৭

তারিখ ঃ ২২/০৬/১৪৩০ বঙ্গাব্দ
২৫/০৮/২০২৩ খ্রিস্টাব্দ

বিষয়: Improving Urban Governance and Infrastructure Program (IUGIP) শীর্ষক কর্মসূচীর অনুকূলে পরিবেশগত ছাড়পত্র প্রদান প্রসঙ্গে।

সূত্র: আপনার ০৬/০৬/২০২৩ ইং তারিখের আবেদন।

উপর্যুক্ত বিষয় ও সূত্রের পরিপ্রেক্ষিতে নির্দেশক্রমে জানানো যাচ্ছে যে, পরিবেশ অধিদপ্তর, সদর দপ্তরের পরিবেশগত ছাড়পত্র বিষয়ক কমিটির ৪৯৯ তম সভায় Improving Urban Governance and Infrastructure Program (IUGIP) এর অনুকূলে দাখিলকৃত আইইই প্রতিবেদন ও অন্যান্য কাগজপত্র সভায় পর্যালোচনা করা হয়। পর্যালোচনান্তে, আলোচ্য কর্মসূচীর অন্তর্গত প্রকল্পসমূহ পরিবেশ সংরক্ষণ বিধিমালা, ২০২৩-এর তফসিল-১-এ উল্লিখিত প্রকল্পসমূহের চেয়ে ক্ষুদ্র হওয়ায় বিধি মোতাবেক ছাড়পত্র প্রদানের অবকাশ নেই মর্মে সিদ্ধান্ত গৃহীত হয়।

২৫/০৮/২৩

(মোসুদ ইকবাল মোঃ শামীম)
পরিচালক (পরিবেশগত ছাড়পত্র)
ফোন: ০২-২২২২১৮৩৪২

প্রধান প্রকৌশলী
স্থানীয় সরকার প্রকৌশল অধিদপ্তর
আগারগাঁও, শেরে বাংলা নগর, ঢাকা।

অনুলিপিঃ

১। সহকারী পরিচালক, মহাপরিচালক মহোদয়ের শাখা, পরিবেশ অধিদপ্তর, সদর দপ্তর, ঢাকা।
২। প্রকল্প পরিচালক, UGIIP-III, লেভেল-১২, এলজিইডি ভবন, আগারগাঁও, শেরে বাংলা নগর, ঢাকা।

Appendix 8: Sample Spoil Management Plan

Purpose and Application: Spoil Management Plan (SMP) is to describe how IUGIP will manage the Spoil generated and reuse related to design and construction works. This is an integral part of EMP. The objective of SMP is to reuse of Spoil from works in accordance with the Spoil management hierarchy outlined in this document.

Objectives of SMP: The objectives of SMP are:

(i) To minimize Spoil generation where possible

(ii) Maximize beneficial reuse of Spoil from construction works in accordance with Spoil management hierarchy

(iii) Mange on site Spoil handling to minimize environmental impacts on resident and other receivers

(iv) Minimize any further site contamination of land, water and soil

(v) Manage the transportation of Soil with consideration of traffic impacts and transport related emissions

Structure of SMP:

Section1: Introduction of SMP

Section2: Legal and other requirements

Section3: Roles and responsibilities

Section4: Identification and assessment of Spoil aspects and impacts

Section5: Spoil volumes, characteristics and minimization

Section6: Spoil reuses opportunities, identification and assessment

Section7: On-site Spoil management approach

Section8: Spoil transportation methodology

Section9: Monitoring, Reporting, Review, and Improvements

Aspects and Potential Impacts

The key aspects of potential impacts in relation to SMP are listed in table below

Aspects	Potential Impacts
Air Quality	Potential for high winds generating air-borne dust from the stockpiles
Sedimentation	Potential for sediment laden site runoff from Soil stockpiles and potential for spillage of Soil from truck on roads
Surface and groundwater	Contamination of surface and ground water
Noise	Associated with Soil handling and haulage and storage
Traffic	Impacts associated with Soil haulage
Land Use	Potential for Soil to be transported to a that does not have permission for storage/disposal
Design specifications	Limitations on opportunities to minimize Soil generation
Sustainability	Limited sites for storage, reuse opportunities

Spoil volumes, Characteristics and Minimization

Spoil volume calculations: Estimate the volumes of Spoils produced from each of the construction sites.

Characterization of Spoil: Based on the type of Soil, characterization is done (sandstone, mud-mix materials, reusable materials

Adopt Soil Reduce, Reuse Opportunities: An overview of the assessment methodology to be used is mentioned below:

- Consideration of likely Spoil characteristics
- Identification of possible reuse sites
- Screening of possible reuse opportunities

Identification of possible safe disposal sites for Spoil: Those Spoils which can't be reuse shall be properly disposed in designated areas; such disposal areas should be identified in project locations. Such disposal areas should be safe from environmental aspects and there should be any legal and resettlement related issues. Such areas need to be identified and prior cliental approval should be obtained to use it as Soil disposal area. The local administration must be consulted and if required permission should be obtained from them.

Storage and Stockpiling Transportation and Haulage route

Based on the above, the contractor will prepare a SMP as an integral part of EMP and submit it to the PDSC for their review and approval.

Summary of Key Issues and Remedial Actions

Summary of follow-up time bound actions to be taken within a set time-frame.

Appendix 9: Traffic Management Plan Template

A. Principles

One of the prime objectives of this traffic management plan (TMP) is to ensure the safety of all the road users along the work zone, and to address the following issues:

- the safety of pedestrians, bicyclists, and motorists travelling through the construction zone;
- protection of work crews from hazards associated with moving traffic;
- mitigation of the adverse impact on road capacity and delays to the road users;
- maintenance of access to adjoining properties
- Avoid hazards in addressing issues that may delay the project.

B. Operating Policies for Traffic Management Plan

The following principles will help promote safe and efficient movement for all road users (motorists, bicyclists, and pedestrians, including persons with disabilities) through and around work zones while reasonably protecting workers and equipment.

- Make traffic safety and temporary traffic control an integral and high-priority element of every project from planning through design, construction, and maintenance.
- Inhibit traffic movement as little as possible.
- Provide clear and positive guidance to drivers, bicyclists, and pedestrians as they approach and travel through the temporary traffic control zone.

- Inspect traffic control elements routinely, both day and night, and make modifications when necessary.
- Pay increased attention to roadside safety in the vicinity of temporary traffic control zones.
- Train all persons that select, place, and maintain temporary traffic control devices.
- Keep the public well informed.
- Make appropriate accommodation for abutting property owners, residents, businesses, emergency services, railroads, commercial vehicles, and transit operations.

C. Analyze the Impact Due to Street Closure

Apart from the capacity analysis, a final decision to close a particular street and divert the traffic should involve the following steps:

- approval from the local authorities to use the local streets as detours;
- consultation with businesses, community members, traffic police, etc, regarding the mitigation measures necessary at the detours where the road is diverted during the construction;
- determining of the maximum number of days allowed for road closure, and incorporation of such provisions into the contract documents;
- determining if additional traffic control or temporary improvements are needed along the detour route;
- considering how access will be provided to the worksite;
- contacting emergency service, school officials, and transit authorities to determine if there are impacts to their operations; and
- developing a notification program to the public so that the closure is not a surprise. As part of this program, the public should be advised of alternate routes that commuters can take or will have to take as result of the traffic diversion.

If full road-closure of certain streets within the area is not feasible due to inadequate capacity of the Detour Street or public opposition, the full closure can be restricted to weekends.

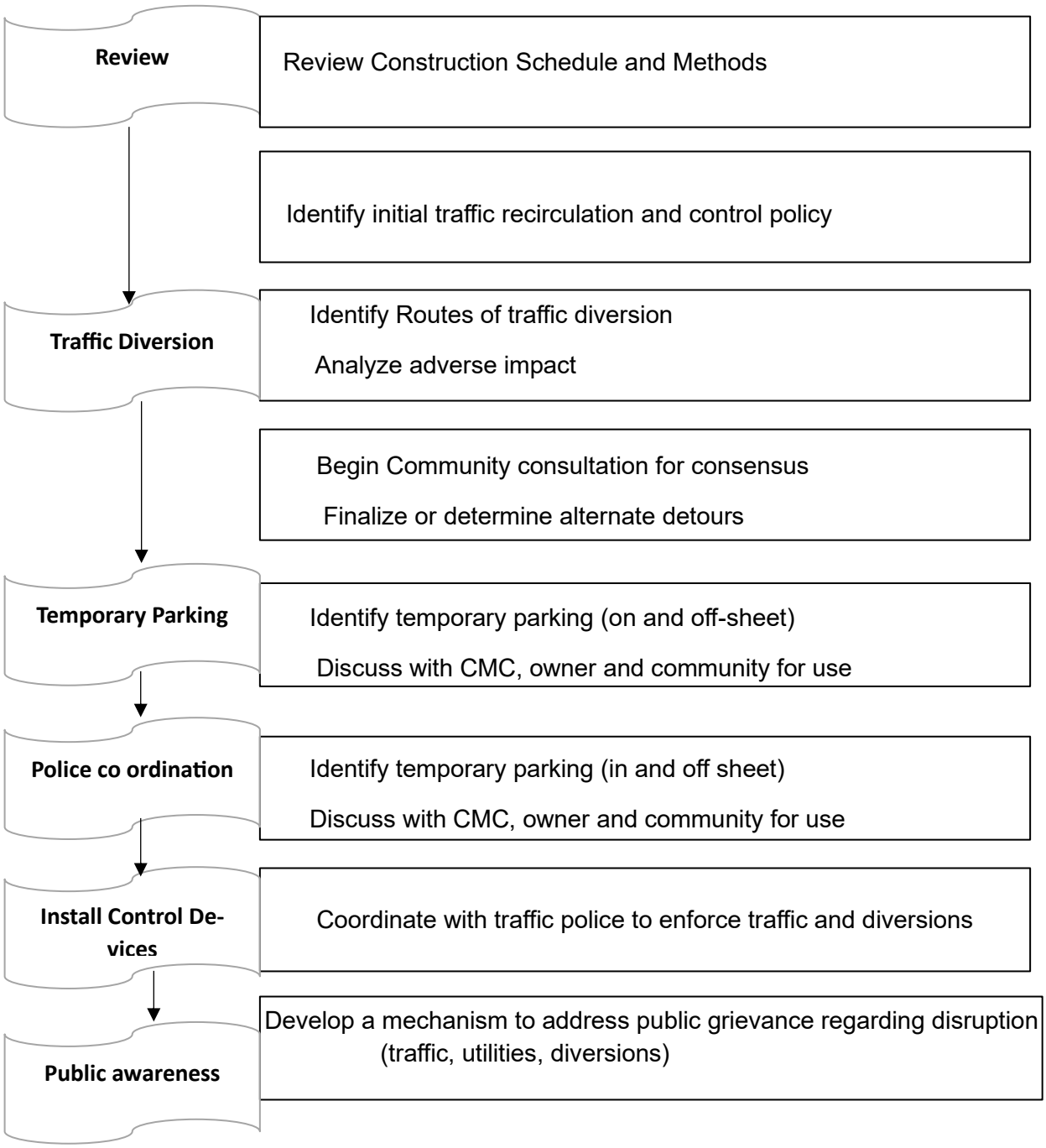

Figure: Policy Steps for the TMP

D. Public awareness and notifications

As per discussions in the previous sections, there will be travel delays during the constructions, as is the case with most construction projects, albeit on a reduced scale if utilities and traffic management are properly coordinated. There are additional grounds for travel delays in the area, as most of the streets lack sufficient capacity to accommodate additional traffic from diverted traffic as a result of street closures to accommodate the works.

The awareness campaign and the prior notification for the public will be a continuous activity which the project will carry out to compensate for the above delays and minimize public claims as result of these problems. These activities will take place sufficiently in advance of the time when the roadblocks or traffic diversions take place at the particular streets. The reason for this is to allow sufficient time for the public and residents to understand the changes to their travel plans. The project will notify the public about the roadblocks and traffic diversion through public notices, ward level meetings and city level meeting with the elected representatives.

The PMCU and PIU will also conduct an awareness campaign to educate the public about the following issues:

- traffic control devices in place at the work zones (signs, traffic cones, barriers, etc.);
- defensive driving behavior along the work zones; and
- reduced speeds enforced at the work zones and traffic diversions.

It may be necessary to conduct the awareness programs/campaigns on road safety during construction.

The campaign will cater to all types of target groups i.e. children, adults, and drivers. Therefore, these campaigns will be conducted in schools and community centers. In addition, the project will publish a brochure for public information. These brochures will be widely circulated around the area and will also be available at the PMCU, PIU and the contractor's site offices. The text of the brochure should be concise to be effective, with a lot of graphics. It will serve the following purpose:

- Explain why the brochure was prepared, along with a brief description of the project;
- Advise the public to expect the unexpected;
- Educate the public about the various traffic control devices and safety measures adopted at the work zones;

- Educate the public about the safe road user behavior to emulate at the work zones;
- Tell the public how to stay informed or where to inquire about road safety issues at the work zones (name, telephone, mobile number of the contact person; and
- Indicate the office hours of relevant offices.

E. Vehicle Maintenance and Safety

A vehicle maintenance and safety program shall be implemented by the construction contractor. The contractor should ensure that all the vehicles are in proper running condition and it comply with roadworthy and meet certification standards of Government of Bangladesh. All vehicles to be used shall be in perfect condition meeting pollution standards of Government of Bangladesh. The vehicle operator requires a prostate of shift checklist. Additional safety precautions will include the requirement for:

- Driver will follow the special code of conduct and road safety rules of Government of Bangladesh.
- Drivers to ensure that all loads are covered and secured drivers to ensure operation equipment can't leak materials hauled
- Vehicles will be cleaned and maintained in designed places.

F. Install traffic control devices at the work zones and traffic diversion routes

The purpose of installing traffic control devices at the work zones is to delineate these areas to warn, inform, and direct the road users about a hazard ahead, and to protect them as well as the workers. As proper delineation is a key to achieve the above objective, it is important to install good traffic signs at the work zones. The following traffic control devices are used in work zones:

- Signs
- Pavement Markings
- Channelizing Devices
- Arrow Panels
- Warning Lights

Procedures for installing traffic control devices at any work zone vary, depending on road configuration, location of the work, construction activity, duration, traffic speed and volume, and

pedestrian traffic. Work will take place along major roads, and the minor internal roads. As such, the traffic volume and road geometry vary. The main roads carry considerable traffic; internal roads in the new city areas are wide but in old city roads very narrow and carry considerable traffic. However, regardless of where the construction takes place, all the work zones should be cordoned off, and traffic shifted away at least with traffic cones, barricades, and temporary signs (temporary “STOP” and “GO”).

The work zone should take into consideration the space required for a buffer zone between the workers and the traffic (lateral and longitudinal) and the transition space required for delineation, as applicable. For the works, a 30 cm clearance between the traffic and the temporary STOP and GO signs should be provided. In addition, at least 60 cm is necessary to install the temporary traffic signs and cones.

Traffic police should regulate traffic away from the work zone and enforce the traffic diversion result from full street closure in certain areas during construction. Flaggers/ personnel should be equipped with reflective jackets at all times and have traffic control batons (preferably the LED type) for regulating the traffic during night time.

In addition to the delineation devices, all the construction workers should wear fluorescent safety vests and helmets in order to be visible to the motorists at all times. There should be provision for lighting beacons and illumination for night constructions.

The PIU and contractor will coordinate with the local administration and traffic police regarding the traffic signs, detour, and any other matters related to traffic. The contractor will prepare the traffic management plan in detail and submit it along with the EMP for the final approval.

Appendix 10: Sample outline of OHS and COVID-19 H&S Plan

Sl no	Activity	Hazard Associated with the activity	Condition	Impact	Control	Use of PPE
1	Mobilization, Clearing and Grub binging.	Injury during falling from height, materials handling, electric shock, slip & trip, vehicle movement etc.	Routine	Human injury &construction hampered	Awareness builds up, cleaning and daily checkup.	Hand gloves, Helmet, visible vest and boot
2	Earth / Sand Filling work	Injury during falling from height, materials handling, electric shock, slip & trip, vehicle movement etc.	Routine	Human injury & construction hampered	Awareness builds up, Cleaning and daily checkup.	Hand gloves, Helmet, visible vest and boot
3	Excavation	Injury during falling from height, materials handling, slip & trip, vehicle movement, edge collapse etc.	Routine	Human injury &construction hampered	Awareness builds up, cleaning and daily checkup.	Hand gloves, Helmet, visible vest and boot
4	Concrete Mixing /setting, carrying etc.	Chemical Hazard, Injury during materials handling, falling, electric shock, slip & trip, vehicle movement etc.	Routine	Human injury & Construction hampered	Follow SOP, Awareness build up, cleaning & daily	Hand gloves, Helmet, visible vest and boot
5	Electrical switchboard, wiring etc.	Noise, injury during materials handling, falling from high, electric shock, slip & trip, vehicle movement etc. during performing work.	Routine	Human injury & Construction hampered	Follow SOP, Awareness build up, cleaning & daily checkup.	Hand gloves, Helmet, visible vest and boot
6	Steel bar cutting, bending, welding etc.	Noise, injury during materials handling, falling from high, electric shock, slip & trip, vehicle movement etc. during performing work.	Routine	Human injury &construction hampered.	Follow SOP, Awareness build up, cleaning & daily checkup.	Hand gloves, Helmet, visible vest and boot

7	Wood / steel shutter making, erection, handling etc. work	Injury during materials handling, falling from high, electric shock, slip & trip, vehicle movement etc. during performing work.	Routine	Human injury &construction hampered	Follow SOP, Awareness build up, cleaning & daily checkup.	Hand gloves, Helmet, visible vest and boot
8	Asphalt / Prime Coat / Tack Coat laying, Dense Bituminous Surfacing, Scarify & hard bed preparation painting works	Injury during materials handling, slip & trip, vehicle movement, fire etc. during performing work.	Routine	Human injury &construction hampered	Follow SOP, Awareness build up, cleaning & daily checkup.	Hand gloves, Helmet, visible vest and boot
9	Plant, equipment, Vehicles movement.	Noise, stuck by, slip & trip, Injury during performing work.	Routine	Human injury & Construction hampered	Traffic management; Follow SOP, Awareness build up, cleaning &daily checkup.	Hand gloves, Helmet, visible vest and boot
10	Materials handling	Injury during falling from high, materials falling, electric shock, slip &trip, platform Collapse etc.	Routine	Human injury &construction hampered	Awareness build up, cleaning and daily checkup	Hand gloves, Helmet, visible vest and boot
11	Fire safety	Fire due to electric short circuit, asphalt laying &welding works	Routine	Human injury /fatality &construction Hampered.	Awareness build up &training, cleaning and daily checkup	Hand gloves, Helmet, visible vest and boot
12	Plaster / Brick on End Edging work, Sand blinding, Flush Pointing etc.	Stuck by, contact with chemicals, slip & trip, materials falling, etc.	Routine	Human injury /fatality &construction hampered.	Awareness build up, supervision training.	Hand gloves, Helmet, visible vest and boot