GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH
Ministry of Local Government, Rural Development and Co-operatives
Local Government Division
Local Government Engineering Department

Emergency Multi Sector Rohingya Crisis Response Project (EMCRP)

Project ID: P167762 **IDA Credit No. 5561-BD**





Environmental Screening Report

For Ratna Palong Haludia Road with culverts and side drain under Cox's Bazar District.

Under the package no. EMCRP/W23

Funded by:

THE WORLD BANK
IBRD • IDA

Government of the People's Republic of Bangladesh & World Bank

Design and Supervision Consultancy:

ddc Development Design Consultants Ltd.

October-2020

Contents

1. INTRODUCTION 1

1.1 Project background 1

1.2 Elementary information of Work Package Components of W23.1: 2

1.3 Proposed intervention items of sub-projects 5

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS 5

2.1 Methodology 5

2.2 Important features/establishments within the PIA 6

2.3 Issues and Recommendations raised by the Participants in regards to component interventions for W23.1 7

3. ENVIRONMENTAL SCREENING 10

3.1 General 10

3.2 Major Findings 10

3.3 Climate Change Impact Screening 13

3.3.1 General Overview of the area 13

3.3.2 Site Specific Screening and outcome 14

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) 15

4.1 General 15

4.2 Health and Safety Measure under COVID Situation 18

4.3 Cost of Environmental Enhancement Works in BOQ 19

5. LIMITATION OF THIS STUDY 19

6. CONCLUSION AND RECOMMENDATIONS 19

Annexure-01: Important Environmental Features (IEFs) near site 21

Annexure-02: Attendance of consultation meetings for sub-projects 22

Annexure-03: Pictures of sub-project location and surrounding features with public consultation 24

Appendix-1: Environmental Screening Form for examining sub-projects 25

Appendix-2: Environmental and Social Management Plan (ESMP) 43

Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.1 51

Appendix-4: Elephant Migration Routes Map 57

Appendix-5: Location Map of Sub-project for W23.1 58

ACRONYMS

BOQ	Bill of Quantities
BFS	Brick Flat Soiling
D&SC	Design and Supervision Consultant
DoE	Department of Environment
DRP	Displaced Rohingya people
EA	Environmental Assessment
EC	Electrical Conductivity
EMCRP	Emergency Multi-Sector Rohingya Crisis Response Project
ESMP	Environmental and Social Management Plan
ERP	Emergency Response Plan
ESMF	Environmental and Social Management Framework
FDMN	Forcibly Displaced Myanmar National
FGD	Focus Group Discussion
FSM	Faecal Sludge Management
GBV	Gender Based violence
GPS	Government Primary School
GRM	Grievance Redress Mechanism
HBB	Herring Bone Bond
IEFs	Important Environmental Features
ISCG	Inter Sector Coordination Group
IUCN	International Union for Conservation of Nature
IWM	Institute of Water Modeling
LGED	Local Government Engineering Department
PIA	Project Influence Area
PIU	Project Implementation Unit
PMU	Project Management Unit
PPE	Personal Protective Equipment
PSC	Project Steering Committee
SMC	School Management Committee
SPM	Suspended Particulate Matter
SWM	Solid Waste Management
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
UNHCR	The United Nations High Commissioner for Refugees
VAT	Value-Added Tax
WB	World Band

1. INTRODUCTION

1.1 Project background

An estimated 730,000[1] people of Rohingya community has fled to neighboring Cox's Bazar district of Bangladesh since August 25, 2017 to escape extreme violence in Rakhine State of Myanmar, which caused the total number of Forcibly Displaced Myanmar National (FDMN) in the district to be about 923,033[2]. This huge number of displaced population account for about one-third of the total population of Cox's bazar, a district which was already facing many development challenges and suffering from resource-constrained social service delivery system even before the crisis evolved and the mass exodus of FDMN has worsened the situation further. Almost all of these displaced people are hosted in Ukhiya and Teknaf Upazila of Cox's Bazar, in extremely congested settlements in areas having very minimal access to basic infrastructure and services and is prone to natural disasters. The Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP) has been designed in order to reduce the vulnerability of Forcibly Displaced Myanmar National (FDMN) along with people from the host communities in Teknaf and Ukhiya Upazila under Cox's Bazar District, to different disasters and improve the social service delivery system and disaster resilience to both the communities. This project will follow a sustainable development pathway that is resilient to disaster and climate change effects.

The objective of the Project is to provide greater protection for the FDMN and host communities through:

- Reducing the vulnerability to natural disasters
- Improving social service delivery system and providing better communication facility through physical interventions
- Improving water and sanitation facilities
- Reducing vulnerability to accidental fire
- Provisioning better educational facilities and
- Strengthening and scaling up of GBV prevention services to the FDMN

The project is jointly being implemented by Local Government Engineering Department (LGED), Department of Public Health Engineering (DPHE) and Ministry of Disaster Management and Relief (MoDMR) under their respective mandate and scope of works. Apart from the interventions in Addressing Gender and Social Inclusiveness and Preventing Gender Based Violence with the Support from UNFPA and building Communication and Awareness among all affected parties through an effective engagement of BCCP (Bangladesh Center for Communication Programs) in the areas, LGED is implementing a good number of infrastructural facilities, namely improvement of hat bazars, roads (both inside and outside of the camps), bridges, culverts, construction of School cum multi-purpose disaster shelters, Satellite Fire Stations, Relief Distribution Center, Community Service Center and many other different types of facilities. Given the project interventions, sensitivity of the areas and volume of people in or around the sites, the project is more likely to trigger certain Operational Policies and Bank Procedures, namely Environmental Assessment (OP/BP 4.01), Natural Habitat (OP/BP 4.04), Forest (OP/BP 4.36) and Physical Cultural Resources (OP /BP 4.11).

[1] ISCG: Situation Report Rohingya Refugee Crisis, (September 27, 2018)
[2] IOM Needs and Population Monitoring round 12 as of October 10, 2018

1.2 Elementary information of Work Package Components of W23.1

It is imperative to recognize proposed components under Work Package-23.1 in Ukhiya Upazila in order to assess and verify its interventions according to stipulated screening requisites from WB. Acknowledging this matter, such details are accounted for as given below in Table 1.2.1 along with visual presentation (General Upazila Map) given in Figure 1.2.1. Aerial maps for each sub-project is given in Appendix -5.

Table 1.2.1: Basic Featured Information of components [Sources of data: Field survey, 2020: DDC & LGED]

COMPONENT'S NAME UNDER W-23	GPS COORDINATES	DISTANCE FROM UPAZILA HQ	UNION	WARD	LOCATIONS UNDER PROJECT INFLUENCE AREA	PRE-EXISTING CONDITION OF ROAD	PROPOSED ROAD TYPE	ROAD DIMENSION(M) (LENGTH X WIDTH) = FOOTPRINT (SQ.M) *
Ratna Palong Haludia Road Id:422945003	**Starting Point** 21.27254^0 N 92.10818^0 E **Ending Point** 21.28279^0 N 92.10856^0 E	4.5km	Ratnapalong & Holudiapalong	8	Khandakarpara, Tekpara, Kotbazar, East Rotna, West Rotna, Klassipara	HBB (Broken), BFS (Broken)	Bituminous Carpeting (BC)	(1205m X 4.9m) = 5,904.5 sq.m

*Note: Roads are proposed to have average carriage way of 3.7m with 0.6m shoulder on each side; special conditions may prompt further adjustments while in construction period. However, footprint for roads are calculated with an average of 4.9 meters.

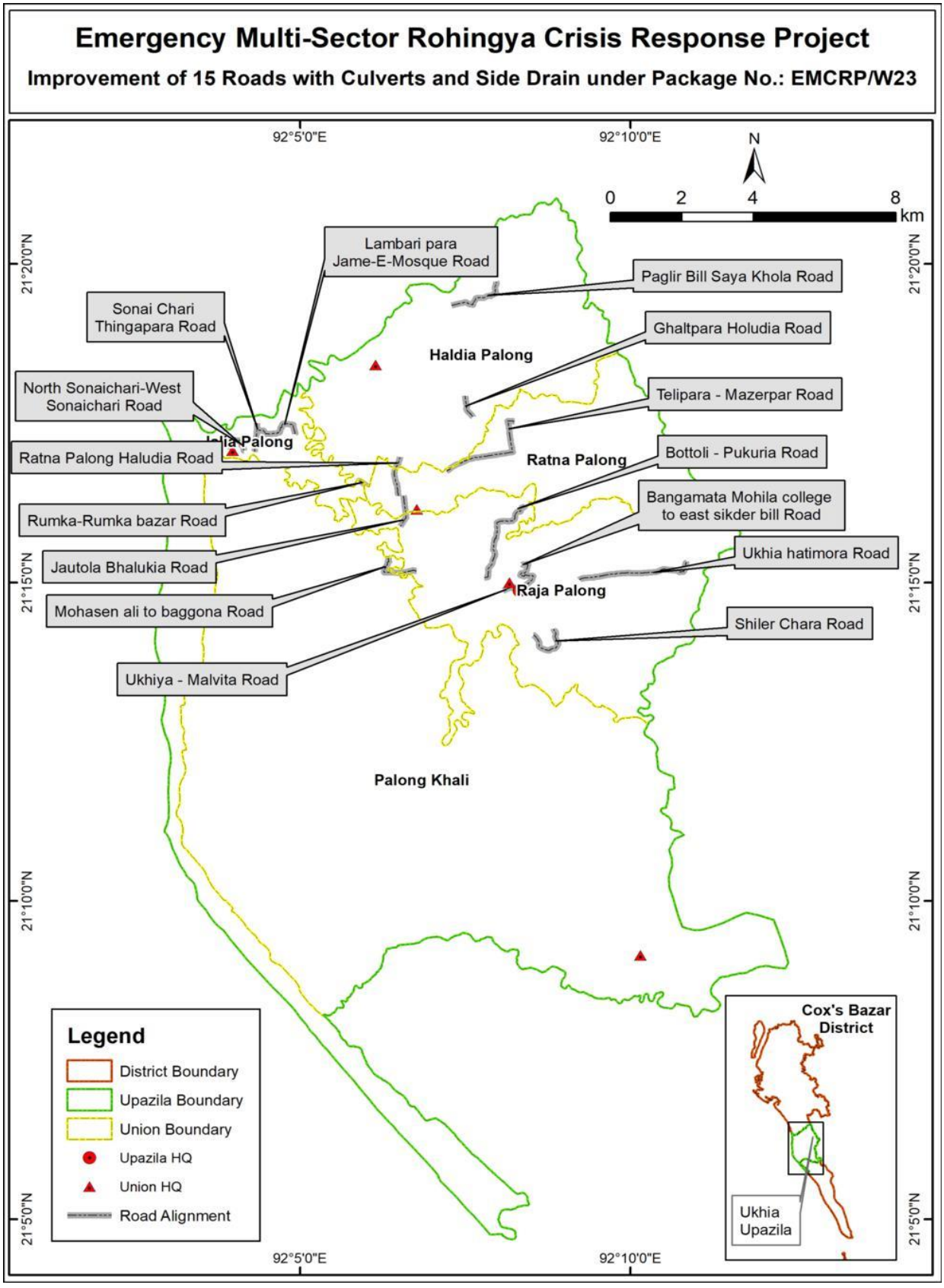


Figure 1.2.1: Map illustrating Roads of Work Package EMCRP/W23 locations in the Ukhiya Upazila

1.3 Proposed intervention items of sub-projects

The roads under work package W23.1 have been proposed with specific need basis dimensions to accommodate and ensure best quality interventions for local stakeholders. In context of governing environmental circumstances and geo-meteorological conditions, protection work items have been added to construction design for safety and sustainability of each proposed roads. These roads are abutting agriculture hence, construction and improvement works will descent these roads into new circumstances in some parts. These items have been included on the basis of field survey and analysis of these conditions. Please follow the table to acknowledge these items.

Table 1.3.1: Proposed safety interventions of sub-project for W23.1

W23-1: Ratna Palong Haludia Road Id:422945003
08 nos. Cross Drain (dimension: 0.975mX 0.975m) at Ch. 1100m, Ch. 1188m, Ch. 1413m, Ch. 1519m, Ch.1630m, Ch. 1873m, Ch.2030m, Ch. 2285m, and 01 **nos. Box Culverts** (dimension: 2.0mX2.0m) at Ch. 1362, **779.0 m L-Drain** at different chainage, **100.0m Palisading wall** and **45.0m Toe wall, Road safety** work and **Environmental Mitigation and Enhancement** works are also included. Description of safety works and environmental enhancement works can be found in BOQ attached in Appendix-03.

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS

2.1 Methodology

Public participation and community consultation have been taken up as an integral part of environmental assessment process of the project. As part of the impact assessment, participatory public consultation was conducted in areas of concern for proposed road by the field level staffs and consultants from PIU and D&SC. The consultation meeting was attended by disparate social groups representing local habitants, separate age groups, social class and occupations. In some cases, IUCN employees in charge of elephant watch tower were present where frequent elephant movements occur. The participants were also selected from different segments of stakeholders, and some of whom will have major active roles before, during and even after the construction works. Therefore, the meeting was organized in an informed, expressive and unbiased manner, wherefrom different views and concerns came across which will be properly taken care of during the design and construction phases. In order to serve our screening process, relevant items were thrown towards the audience to discuss and troubleshoot confusing or worrying matters regarding the proposed intervention under package work. Impacts in regards to environment, socio-economic matters during pre-construction, construction and post construction phase has been put forth. Possible mitigation measures and relevant needs have turned out during these sessions as well. Moreover, their comprehension as a stakeholder has been up lifted in light of project guidelines.

However, public consultation is a living process as the types of problems/ difficulties, involved parties or stakeholders and mode of settlement or resolution processes are more likely to differ with time. Thus, consultation with different parties or stakeholders will be continued throughout the sub-project implementation period and records of resolutions, whatsoever and wherever possible, will

be kept in writing at the site and made available on any enquiries or requests by all parties concerned.

All components under the work package have been put through review for locating impediments or possible adversity effecting future environment and socio-economic conditions. In order to comprehend surrounding features and impacts which may stipulate with it, screening has acknowledged having a Project Influence Area (PIA) of 0.5-kilometer radius. Sensitive findings have been identified if any, and relevant mitigation or minimization measures were suggested to subdue such complication for over the project construciton period. Moreover, evaluation was inspired to enhance environmental features and include monitoring initiatives under ESMP budget to ensure exertion of environmental improvement propositions. Contractor's responsibility has been taken into account while identifying possible impacts through sets of intervention accounts. These steps have been initiated strictly following ESMF guidelines and requirements. Environmental screening procedure was motivated by ingredients highlighted in Appendix-2 of ESMF. During survey, detail chainage length of the sub-projects was taken into account for detailing environmental and socio-cultural features within 100 meters buffer zone of both Left and Right side from the center line of the road. Longitudinal intervals of 300 meters have helped to identify positions of sensitive or near-sensitive socio-cutural features. These findings are illustrated in **Annexure-01**.

2.2 Important features/establishments within the PIA

Initial screening process is conducted through direct involvement of PIU and D&SC in the influence area of the proposed component, which allows to raise significant questions and ideas towards participants. In combination of both field walk-through and inputs of audience, a register of existing features is formed. Allow the following table to describe such elements in all the work package components.

Table 2.2.1: Important features within Project Influence Area for W23.1

Component's name under W-23	Direction	Important features/ establishment (approx. distance from the proposed site)
Ratna Palong Haludia Road Id:422945003	North	Darogamora Graveyard/Mosque(500m), Fatematuz zohora Madrassa(500m), Torshakhali khal(500m), Kotbazar Ideal KG School (20m NW)
	South	Matborpara jame Mosque(180m), New Jhautola Mosque(400m)
	East	Ahmadia Rahmania Hefzokhana and Madrassa (180m), Palong High School(200m), Rotnapalong GPS (200m), Rotnapalong Buddhist Mandir(400m)
	West	Households (30m)

2.3 Issues and Recommendations raised by the Participants in regards to component interventions for W23.1

After inauguration has set in motion, their valuable opinions and remarks came pouring out. At this point, we find our field base knowledge for assessment attributed impact degrees and possibilities. Please follow the table 2.3.1 given below to recognize participants' inputs arranged in relevance with this component. Consultation meeting summary, attendance sheets and pictures of separate meetings with proposed location for this sub-project component can be found in Table 2.3.2 and Annexure-02 and Annexure-03 respectively.

Table 2.3.1: Issues and Recommendations raised by the Participants

COMPONENT'S NAME UNDER W-23.1	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
Ratna Palong Haludia Road Id:422945003	•They are very much concerned with absence of reliable path route in Khandakarpara, Tekpara, Kotbazar, Ratna (East, West), Classipara area. • In case of emergency conditions such as ambulance services cannot reach these locations. • Travelers are prone to accidents due to bad road conditions.	• Local people considered that the selected site is suitable for the construction of this road from both the technical and social-environmental (direct savings in the cost of operating vehicles, time savings by travelers and freight, wider effects can less accident rates, road being waterproof and dust free, much more durable) point of view. It will provide better mobility and access to services in due time. •The road should consider water flow during rainy seasons thereby ensuring the

COMPONENT'S NAME UNDER W-23.1	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
	•Possible dust and noise pollution during the construction works. •Safety of children and adults at the sites during construction works. •Elephant movement is not present. •Local community wish to have a better drainage system along with the road in order to allow waters from undulated terrains to find an uninterrupted pathway not causing harm to agriculture fields and wash away top soil of adjacent grounds residing alongside the road. It will protect the top soil for future growth of crops and aid vegetable farming. •The participants have expressed their greater interest for this intervention and believes this will bring nothing but prosperity for the entire catchment dwellers. •Household boundary fences along the road should not be affected while construction • No trees should be harmed for improvement of this road • Available pathway to usher material delivering vehicles • Labor shed availability in the target location •Identification of material storage location based on consultation with local communities.	construction is not affected by mass water flow. •Enough pathway is expected for vehicle movement so that comfort travel is achieved. •Construction site safety should be ensured to avoid any mishaps or accidents during work periods. •They also requested to involve the local community to construction work and they will welcome any outside key labor. •During construction period, alternate route to pass through this area is available. •Since the road is passing alongside homestead gardens and agriculture fields, the intervention will invite air pollution on moderate level during construction period. However, preventive actions and measures can be taken to keep air quality from degrading. •Women should be recruited equally, wherever possible. •They have also ascertained that the selected site is free from any events related to resettlement and major environmental impacts. The adverse environmental impacts that may come in the way of air quality, noise, solid waste, occupational health & safety during the construction period, and will be of short duration, yet proper management/conservative options should be adopted. •Alongside the road since there are available open space, these can be used as labor shed and material storage • An access point called bhalukia road is available for ancillary access.

Table 2.3.2: Consultation Meetings Summary

Road Package Number	Date DD-MM-YYYY	Venue	Main Participant Groups	No. of Participants	Remarks (If any)
W23-1	06-10-2020	Infront of Kabir Miya's House	Host Community	35	The local individuals, elites, chairman and/or member of respective Union Parishad, representatives from different agencies participated in those consultation events.

3. ENVIRONMENTAL SCREENING

3.1 General

This section identifies the potential impacts that the various elements of the proposed Project may have on the physical, biological and socio-economic environment within half a kilometer of the radial distance around the site. Environmental Assessment (EA) based on this screening study for the Sub-project has been conducted to identify and determine which potential Project impacts may be significant and therefore require the application of reasonable and effective management and/or mitigation measures.

In order to realize the exact physical, biological, socio-economic and environmental impacts of the proposed sub-project sites and the influence area in regards to the implementation measures, an extensive field visit was carried out in each proposed sub-project PIA. Environmental Screening form, as adopted in **Appendix 2** of the Environmental and Social Management Framework of EMCRP, was administered for identifying the impacts and their extents.

The screening data and information for this sub-project component and details screening summary have been formulated and shown in **Appendix-01.**

3.2 Major Findings

A complete view of current environmental conditions of individual sub-projects in relation to interested queries has been congregated in order to understand the degree of impacts corresponding with marked interventions. Interestingly, most sub-project has correspondence with its surrounding features and upholds interchangeable impacts. However, the degree is not an interchangeable factor since scale is not parallel to each of these components which is where, mitigation measure differentiation is implied. There are some cases where unique circumstances have been met with while environmental screening took place which is also accounted for and should be a matter of concern for other parts of the ESMF initiative. The significant issues observed for this sub-project component is enlisted in following Table 3.2.1 with pertaining impacts. Moreover, impacts that are adventitious has also been embraced for promoting best practices.

Table 3.2.1: Concerning environmental issues relating to each proposed subproject and influence area for W23.1

COMPONENT'S NAME UNDER W-23.1	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
RATNA PALONG HALUDIA ROAD ID:422945003	It is not located within any major environmentally sensitive area.	It will not cause any severe negative effects to the environmental settings of the area neither to important environmental features.
	Construction period will induce air pollution while preparing for bitumen and loading-unloading raw materials. Impacts on air quality during the construction phase may turn to negative. The main impacts include dust generation from crushers, vehicles and the transportation of all types of construction materials.	It will invite waste production which may in turn cause minor air pollution due to deposited dust and airborne particles less than PM_{10}. Dust pollution may slightly suffocate photosynthesis however this can be minimized through regular water sprinkling as suggested in ESMP.
	Noise emission from construction machineries and equipment can cause nuisance to local residents and workers.	The ambient noise level might have potential to increase temporarily and intermittently in the close vicinity of active construction fronts.
	No agriculture, fish farming and significant vegetation coverage is located in the ROW nor does it stand over such items. Nonetheless agriculture fields and homestead gardens/forest are found beside the road.	No agriculture land or any forest coverage will get degraded or lost for construction. Liquid waste such as left-over oils or chemicals might run into these adjacent features.
	Construction works will involve chemical usage and preparation of on-site add-ons to the road. Generating scraps and residues.	The runoff from work site may enter existing pond and frustrate the water quality which will be acute however.
	Few amounts of bush (sapling) will be cut down during construction phase at different chainage.	No severe damage will occur or damage to habitat will be faced. It can be managed by introducing small plantation incentives around the proposed location.
	Elephant Movement is not present in the vicinity of the subproject location.	No impact is expected
	No heavy earth excavation work will be involved.	Consequently air, noise and dust pollution will be occurred within a small-scale during construction period only.
	Construction related activities and setting up of labor camps along with associated facilities and their management can cause adverse impacts.	Noise pollution from pilling or drilling, air pollution caused by dust or gaseous emissions from vehicle movement, running of motorized equipment and land clearing, odors and soil pollution from leaking of latrines and fecal sludge, will more likely to take place.
	Chemical spills or improper disposal of construction waste materials due to lack of worker training and misconduct of contractor's safety initiatives.	During the construction period, soil may get contaminated from activities such as handling of hazardous construction materials (such as fuel, lubricants, paints, and solid waste and sewage).

COMPONENT'S NAME UNDER W-23.1	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
	Vibration effects generated from pilling, drilling or other construction works	Any vibration would result in nuisance effects to nearby faunal species, but will be localized and temporary and will unlikely to result in structural damages to buildings or walls of the adjacent private properties.
	Sensitive environmental, cultural, archaeological, religious sites within 1 kilometer of site includes including Darogamora Graveyard/Mosque(500m), Fatematuz zohora Madrassa(500m), Torshakhali khal(500m), Kotbazar Ideal KG School (20m NW) to the North. Matborpara jame Mosque(180m), New Jhautola Mosque(400m) to the south. Ahmadia Rahmania Hefzokhana and Madrassa (180m), Palong High School(200m), Rotnapalong GPS (200m), Rotnapalong Buddhist Mandir(400m) to the east and Households (30m) to the west.	No disturbance to all these establishments/features is anticipated due to construction activities for the sufficient distance from the construction site, and strict construction site management system- including restrictive work schedule during the daytime only, water-sprinkling twice a day on and around the site, safe storage of materials, etc.

A few incidents of human elephant conflict have been reported in 2018. The IUCN has conducted a study on such conflict. With the support from UNHCR, IUCN has been marking elephant routs and corridors and informing local communities and stakeholders of avoiding the marked areas. As part of the mitigation options, different initiatives have been undertaken, such as formation and capacity development of Elephant Response Teams (ERTs); providing equipment to ERTs to divert in-coming elephants; and setting up elephant deterrent tools (e.g. trip alarms and watch-towers). Though the current chances of occurrence of conflicting incidence are zero, any recurrence would be managed by the ERTs and they will be called if there appears any minute possibility to recur. A map of elephant movement is given in Annexure 04.

In order to offset the loss or attenuating the environmental degradation, a set of mitigation measures will be adopted, on top of general practice of standard construction procedure or following the relevant codes of practices.

3.3 Climate Change Impact Screening

3.3.1 General Overview of the area

Cox's Bazar is one of the coastal districts of Bangladesh and is prone to the effects of climate change due to its geomorphological siting and climate induced effects. The hilly tracts of Cox's Bazar could foster further environmental crisis brought on by indiscriminate deforestation and diminishing groundwater reservoirs, which have been taken place in recent months as the Rohingya crisis evolved. A recent study conducted by World Bank[3] has found that Cox's Bazar will be the worst-hit district in South Asia as average temperatures rise and rainfall patterns become disruptive, by 2050, if greenhouse gas emissions continue unabated.

The hilly region of the country, especially the part in Cox's Bazar is characteristically of muddy soil structure, not of any rocky formation and the stability comes from the roots of the trees. Also rainfall, proximity to the sea, elevation, and land cover are very important factors for analyzing the risk of cyclone. Denudation of trees from hilltops in order for the huge settlement of Rohingya people has already increased the vulnerability to the risk of hill collapse by destabilizing the terrain. Also deforestation at a rapid speed uncovers the land and raise the risk of occurrence of cyclones, as forests protect land from high wind and storm surges where demolishing the trees would make the area vulnerable.

Together with the above-mentioned hazardous situation, again due to sudden extraction of huge amount of groundwater, availability of potable water from shallow tube wells that pump water up from about 150 feet has already reached to a critical level. Averting the problem requires new tube wells to be plumbing deeper into the poorly mapped aquifer, but going deeper than 700 feet in some places may cause salt water to contaminate freshwater resources.

In this case, it is possible that a stationary position of the freshwater-saltwater transition zone can be established via proper management of pumping in the confined aquifer.

The groundwater resource is seen to suffer more from the climate change impact. The impact on groundwater due to climate change impact include

- Sea-level rise could result in a transgression of the sea and a loss of land area. This could also lead to the secondary effect of population migration in the new coastal band due to migration of the coastal population from the encroaching sea, thereby increasing domestic water needs in the new coastal area.

- Transgression of the coast implies that saline storm surges of 1 or more meters depth would penetrate beyond the new coast to new land areas. Storm surges transport saline water far inland of the coast and much of this floodwater may infiltrate the ground in areas where the aquifer is not fully saturated. Even where the aquifer is saturated, denser saline water may

[3] https://openknowledge.worldbank.org/bitstream/handle/10986/28723/9781464811555.pdf

sink into the aquifer during the flood and later from pools of saltwater that remain following the flood[4].

- It has been identified that the salinity is found in the shallow aquifers along the coastline. So the salinity which are found in the groundwater are of lesser concern as salinity will subside over time

- Several researches show that through modeling of groundwater flow that the depletion of groundwater in the host community will persist up until 2022 and the replenishment of water will take place.

Considering the general climate change effects in Cox's Bazar area and offsetting the aggravating environmental situation due to the mass arrival of Rohingya communities, several specific measures including tree planation in sub-project areas, rainwater harvesting from every disaster shelter, construction of drainage facilities along the road length and installing thunder arrester across the areas, have been suggested and will be implemented.

3.3.2 Site Specific Screening and outcome

Climate Change impact on a particular subproject is tough to deduce as the highest resolution of climate model simulation done over Bangladesh is 50km. Depending on the simulation ensemble of Cox's Bazar district, the temperature and precipitation are likely to increase with time.

Site specific climate change impacts are often not so easy to measure or deduce plausibly while the site is confined to a narrow strip of roadways, and associated mitigation or offsetting measures are really hard to plot on the impact areas, though an overall set of measures are often considered in practical aspect. Fig:1 shows the inundation risk map of the subprojects under W-23, none of the subprojects are in vicinity of the severe river flood inundation area. So the risk of flooding is low around the sub-project area

[4] "Implications of Climate Change for Fresh Groundwater Resources in Coastal Aquifers in Bangladesh", World Bank report.2010

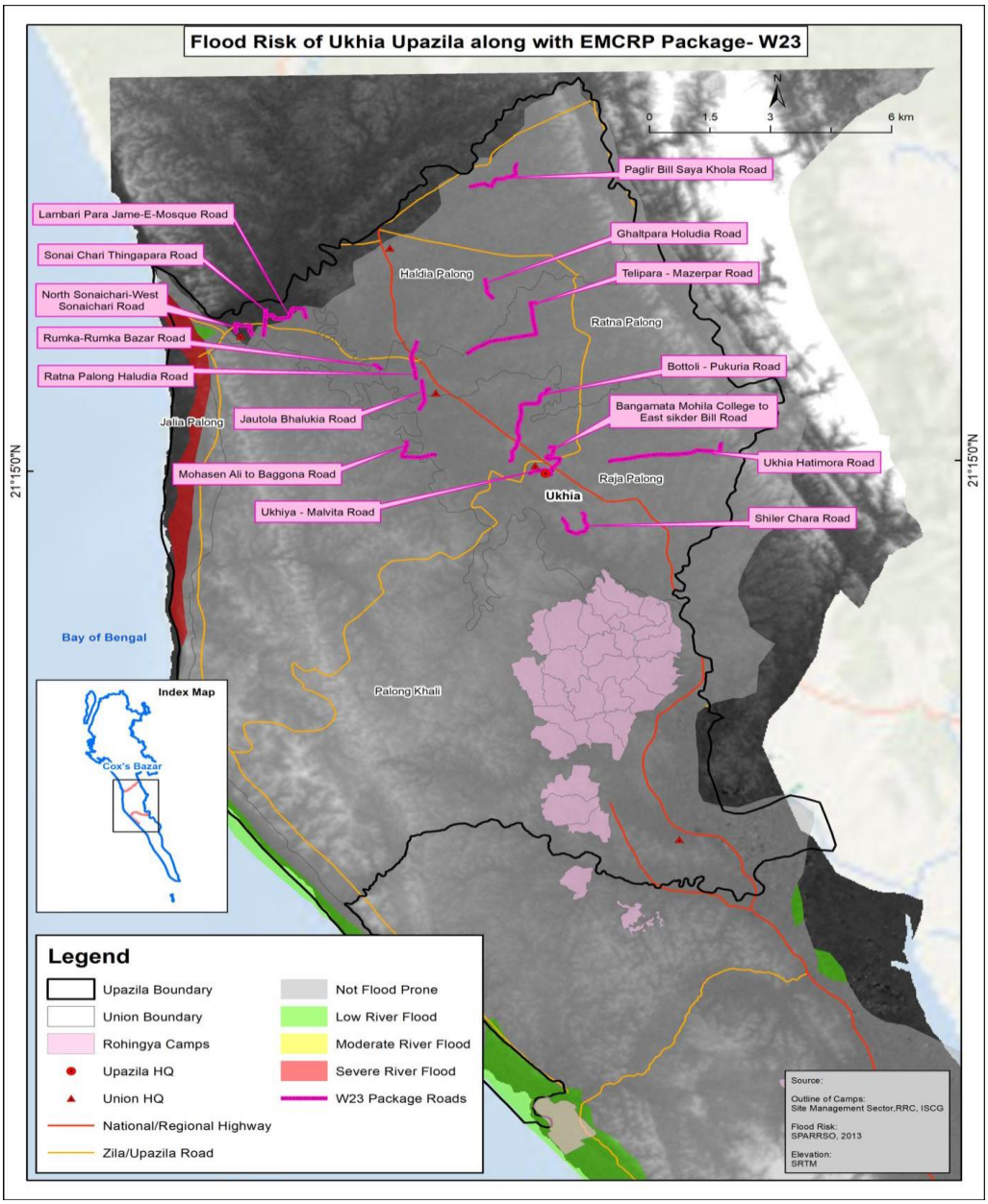


Figure 3.3.2.1: Flood inundation risk map near the subprojects.

Also, in order to avoid the devastation caused by the thunderstorm, state-of the-art thunder arrester (lightning protection system) has been suggested to install having a coverage area of 25,434 sq.m for a single arrester. In addition, tree planation on the road slope/ within the premises is also suggested to sooth the temperature effect and increase the water retaining capacity of soil, at the same time.

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

4.1 General

Considering the environmental settings of the sub-project area, it can be assumed that possible impacts would be largely construction-related, and could be addressed through adoption of good engineering practices; good housekeeping; better *in-situ* construction materials management; and observance of health and safety protocols during the implementation period.

Table 4.1.1: Site Specific Impact and Mitigation Plan under package W23.1

Component's name under W-23.1	Impacts	Mitigation plan
Ratna Palong Haludia Road Id:422945003	To the north Kotbazar Ideal KG School (20m NW) and settlements located adjacent to the sub-project area might get affected during the construction period with the generated debris and dust, though for the time being.	Contractor must adhere to the best practice debris management procedure and regular adoption of dust control measures (spraying of water at least twice a day) to minimize the effect to the level best.
	Proposed subproject area arises water logging problem during the monsoon sometimes. On the other hand, some part of the proposed road is passing by the agricultural land. Box culvert and Cross drain will be constructed to terminate rainwater for one side to another side during rainy season and also help for rapidly remove excess soil water to reduce or eliminate waterlogging during monsoon and return soils to their natural field capacity and will help to maintain the water balance of both roadside agricultural land to provide a sustainable irrigated agricultural system. It will also help to prevent flood and not to allow water to overflow and also help to divert water for farming. Some high land is found beside the road. So, L-Drain will be constructed for drainage high land eel water during rainy season. Some low land is found beside the proposed road so palisading wall will be constructed during construction period for used to "correct" the natural slope. There are points on the road where slope preparation cannot be done due to having low lying agriculture lands and water bodies. Slope preparation refers to resettlement issues as well in those locations. In such cases Toe Wall is proposed which helps to restrain the horizontal surface pressure. This is an adaptation technique and a precaution measure to not allow any damage to sideline existing low-lying features. There are low lands along the road where agriculture fields and ponds are present. This also excludes high chance of soil quality degradation.	08 nos. Cross Drain (dimension: 0.975mX 0.975m) at Ch. 1100m, Ch. 1188m, Ch. 1413m, Ch. 1519m, Ch.1630m, Ch. 1873m, Ch.2030m, Ch. 2285m, and 01 nos. Box Culverts (dimension: 2.0mX2.0m) at Ch. 1362, 779.0 m L-Drain at different chainage, 100.0m Palisading wall and 45.0m Toe wall. Road safety work and Environmental Mitigation and Enhancement.

Further construction related activities which may result in adverse impacts in the surrounding environment of the sub project must be kept under close consideration and appropriate mitigation and management measures will be taken with due care and vigilance. Once the effects are minimized to its least level and controlled efficiently, it will turn into a welcoming and beneficial project for the local communities. The subproject specific environmental

management plans have been outlined in **Appendix-2**. The mitigation measures as well as monitoring program of ESMP have also been incorporated in the management plan.

Environmental quality enhancement: Under the additional financing to the EMCRP project, Forest Department of the Government of Bangladesh will afforest along 200 km of road length area, primarily under the Ukhiya and Teknaf Upazila of Cox's Bazar district in order to offset the environmental and ecological devastation, that had been occurred due to the evolution of Rohingya Crisis, to an achievable level. Many of these road lengths will go through and by the Rohingya Camps, up on the hill and are already denuded of trees or vegetation. Local Government Engineering Department (LGED) will allocate and channelize the finance to the Forest Department under the said additional financing component and oversee the progress of works with due diligence. However, this enhancement work will improve the environmental quality of the area and reinstate some parts of the ecosystem services to those areas, though primarily.

4.2 Health and Safety Measure under COVID Situation

Apart from the established Occupational Health and Safety (OHS) measures being followed in construction sites, offices, and labor camps, a set of additional measures has to be taken and practiced throughout the daily cycle by each labor, staff and any involved parties, due to the ongoing pandemic coronavirus situation. Staffs and consultants at PIU and D&S, along with the pool of consultants under different firms/agencies for different services, and all the representatives or staffs of construction contractors and suppliers have to play much sensitive, (pro-) active and responsible roles in abiding by the rules and measures by themselves and getting the involved workers and different stakeholders adhered to the same. A detailed guideline containing a set of measures with shared responsibilities has been sketched out in order to fight the exposure and further spread of this potentially fatal situation. This plan or guideline shall constitute an integral part of ESMP measures for every sub-project, though is not included in this report to keep it concise and specific, and the contractor is required to keep the copy of that guideline at every site office.

However, among many other relevant issues, the guidelines emphasize on following line of directives:

a. Contractor must designate one of his employees as H&S/Safeguards supervisor to lead, coordinate and interface in order to fight the COVID 19 situation under the direct guidance of COVID focal at PIU of EMCRP project.
b. All workers, supervising and supporting engineers and staffs, consultants, service providers and other concerned parties must adhere to the personal health and hygiene rules, social distancing, and other protective measures in full in order to protect themselves and contain the infections any further. Necessary training and awareness campaign will be aligned with the specific sub-project scenario and prevailing conditions.
c. General practice of cleaning and hygiene has to be maintained in all project/site offices and camp sites, and supply of necessary PPEs and cleaning /disinfecting materials along with proper use of those is to be ensured.
d. Public consultation and stakeholder engagement are to be carried out considering the prevailing risks of virus transmission in the target areas, scope of interventions and level of ICT penetrations among the target stakeholders, and so on.
e. Necessary protocols have to be established and maintained in case of handling a sick employee or worker, and appropriate compensation to a sick disengaged labor is required to be given with due documentation.
f. Budgeting for suggested protective measures, along with necessary supervision and monitoring for the required interventions has to be ensured.

Following the additional health and safety measures presented in that guideline, sub-project component specific BOQ items have been inserted to supplement the budget considering the country-specific situation, capacities, and scope of interventions. The additional cost to Health and Safety Measures under COVID 19 situation is shown in **Appendix-3.**

4.3 Cost of Environmental Enhancement Works in BOQ

In consideration to the above-mentioned environmental impacts and their mitigation measures for this sub-project component, a set of items are included in the BOQ of this sub-project component. Social Safeguard Personnel for Environmental and Social Management for Work Package EMCRP/W23 has also been added in the whole BOQ in order to take supervision and leadership to organize Environmental Management under Environmental Enhancement Works. The total costing and estimation have included enhancements such as Grass turfing plans, Tree plantation initiatives, Dust Suppression mechanisms. On the other hand, in order to ensure health safety and sanitary measures of workers PPE, First Aid Box, Labor shed, Environmental management, drinking water facility with water tests, Temporary latrine for both male and female as well as waste disposal systems has been accounted for. Ensuring sustainable labor performance in regards to environmental and social considerations motivational training has been taken into account. An overview of the estimation is given below and the detailed estimated cost to implement the ESMP is shown in **Appendix-3**.

5. LIMITATION OF THIS STUDY

Bangladesh government has imposed a nationwide lockdown to curb the spread of the novel coronavirus in the wake of series of deaths and infections. Authorities declared a ban on passenger travel on all sector from March 24 while all public transport on roads have been suspended from March 26 to stem the spread of virus, officially known as COVID-19. All office works have been postponed and an intended visit to the sites for further consultation with the relevant stakeholders has had to cancel due to this crisis. Therefore, some relevant information and arrangement needs awaiting for recovering this pandemic crisis.

6. CONCLUSION AND RECOMMENDATIONS

The overall conclusion is that if the mitigation, compensation and enhancement measures are implemented in full, there will be no significant negative environmental impacts in regards to the selection of location, design, construction, and/or operation procedure of the proposed Sub-project. There will in fact be tremendous benefits from recommended mitigation and enhancement measures and major improvements in quality of life, opportunities in business, trading jobs and ensuring social safety and security will be achieved once the scheme is in operation.

The conclusions of the Screening study can be summarized as follows:

- The communities will receive large benefits through improved infrastructural facilities, transportation & communication etc.
- The short-term negative impacts that may come by the way of air quality, noise, solid waste, occupational health & safety need to be minimized through the management plan.
- The project will create employment for those who live in the vicinity of the construction site and will provide them a short-term economic gain.
- The green belt development, if necessary, for the road site, with large-growing trees at the periphery of the site will give the places a more natural and pleasing appearance.
- A comprehensive Environmental and Social Management Plan (ESMP) has been prepared to mitigate and reduce the adverse impacts that will come out from the Subproject activities.

Implementation of this Sub-project will have large positive impacts to the communities in terms of improved infrastructural transportation & communication facilities, which would eventually develop the socio-economic condition of the catchment areas. So, strong recommendation should be put in place to implement the sub-project within shortest possible period of time, and with great care and efficiency.

Annexure-01: Important Environmental Features (IEFs) near site

Detail Environmental features within 100m of the both sides from the center line were collected @300m longitudinal intervals. The findings of the survey for the aforementioned road can be seen in the table below:

Table: Detailed Chainage length and features of the Sub-Project component

Road Name	Ratna Palong Haludia Road Id:422945003 **(W23-1)**	**Total Chainage**	1205m

Chainage (m)	**Left**	**Right**	**Features**
000-300	L		Brick wall, graveyard, wired fence with RCC pole, pond, trees, Electric Pole, bamboo fence, household connecting road to the left, tin fence, vegetable yard
		R	Bamboo fence, wired fence with RCC pole, nut tree garden, wired fence, nut tree garden, tin fence, Households, household connecting road to the right, graveyard, households, nut trees, vegetable yard
300-600	L		households, brick wall, bush, vegetable yard, bush, trees, vegetable yard, bamboo fence
		R	Household connecting road to the right, trees, vegetable yard, tin fence, bamboo fence, settlements, bush, vegetable yard, tin fence, households, wired fence with RCC pole, Tin fence
600-900	L		Pond, bamboo fence, households, wired fence with RCC pole, tin fence, Households, Electric pole, household connecting road to the left, bamboo fence, tin fence, household connecting road, pond, wired fence with RCC pole, crop field, wired fence
		R	Brick wall, bush, garden, tin fence, household connecting road to the right, brick wall, households, open space, tin fence, households, bridge (khandakar para bridge), agriculture field
900-1205	L		Bamboo fence, bush, household connecting road to the left, tin fence, bamboo fence, garden, households, household connecting road to the left, open space, households, tin fence, vegetable yard, household connecting road to the left, households on the high ground
		R	Bush, wired fence, open space, tree, wired fence, tree, shop, household, bamboo fence, tine fence, earthen small mound

Annexure-02: Attendance of consultation meeting

EMCRP/W23.1

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)
জরুরী ভিত্তিতে রোহিঙ্গা সংকট মোকাবেলায় বহুখী সেক্টর প্রকল্প
Local Government Engineering Department (LGED)
Public Consultation Participants List

Focus Group Discussion

সময়: 11:45 AM তারিখ: 06/10/2020

উপ-প্রকল্প/কার্যালয়ের নাম: Ratnapalong Holudia Road

সভা স্থানের স্থান: In front of Lebin Miah house

ইউনিয়ন: Ratnapalong ওয়ার্ড নং: 08 মৌজার: Ratnapalong উপজেলা: Ukhiya জেলা: কক্সবাজার

সভা পরিচালনা করেন: EMCRP/W23.1

অংশগ্রহণকারীদের তালিকা (পরিচয় ও স্বাক্ষর)

ক্রম নং	নাম	বয়স	পুরুষ/মহিলা	গ্রাম	স্বাক্ষর / টিপসই
০১	মোঃ মোজাম্মেল হোসেন	২৮	পুরুষ	হলদিয়া	মোজাম্মেল
০২	মোছাঃ আমেনা খাতুন	২৪	নারী	হলদিয়া	আমেনা
০৩	মোছাঃ জাহানারা মুসলিমা চাকমা	২৫	নারী	হলদিয়া	জাহানারা
০৪	মোঃ আবু হাসেম	৪২	পুরুষ	হলদিয়া	আবু হাসেম
০৫	মোঃ আবুল্লাহ	৪০	পুরুষ	হলদিয়া	[illegible]
০৬	মোঃ ইসলাম হাসিন	৪১	পুরুষ	হলদিয়া	[illegible]
০৭	মোঃ আবুল খায়ের	৫০	পুরুষ	হলদিয়া	[illegible]
০৮	মোঃ আবুল কাশেম	৫১	পুরুষ	হলদিয়া	[illegible]
০৯	মোঃ আবুল্লাহ আল হারুন	৪৪	পুরুষ	হলদিয়া	[illegible]
১০	মোছাঃ আয়েশা খাতুন চৌধুরী	৫৪	পুরুষ	হলদিয়া	[illegible]
১১	মোছাঃ আয়েশা খাতুন চৌধুরী	৫৩	পুরুষ	হলদিয়া	[illegible]
১২	মোঃ সফিক আহমদ	৫৫	পুরুষ	হলদিয়া	[illegible]
১৩	মোঃ আমিনুল্লাহ	৩১৫	পুরুষ	হলদিয়া	[illegible]
১৪	মোঃ সফিউল্লাহ তালিব	৪০	পুরুষ	হলদিয়া	[illegible]
১৫	মোঃ মোহাম্মদ ফিরোজ	৩৫	পুরুষ	হলদিয়া	[illegible]
১৬	মোঃ নিজাম উদ্দিন	২২	পুরুষ	হলদিয়া	[illegible]
১৭	মোঃ হুসাইন মিঠির	৩৮	পুরুষ	হলদিয়া	[illegible]

EMCRP/W23.1

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)
জরুরী ভিত্তিতে রোহিঙ্গা সংকট মোকাবেলায় বহুমুখী সেক্টর প্রকল্প
Local Government Engineering Department (LGED)
Public Consultation Participants List

Focus Group Discussion

সময়: 11:45 AM তারিখ: 06/10/2020
উপ-প্রকল্প/আলোচনার এর নাম: Ratnapalong Holudia Road
যে স্থানে হবে: In front of Kabir Miah House
ইউনিয়ন: Ratnapalong ওয়ার্ড নং: 08 উপজেলা: Ratnapalong জেলা: Ukhiya বিভাগ: চট্টগ্রাম
আলোচনা নং: EMCRP/W23.1

অংশগ্রহণকারীদের তালিকা (পরিচয় ও স্বাক্ষর)

ক্রম নং	নাম	বয়স	পুরুষ/মহিলা	গ্রাম	স্বাক্ষর / টিপসই
১৬	মোঃ জসিমউদ্দিন	২৮	পুরুষ	পশ্চিম পাড়া	
১৭	মোঃ নুরুল আমিন	৫৮	পুরুষ	পশ্চিম পাড়া	
২০	মোঃ সেলিম	৩০	পুরুষ	পশ্চিম পাড়া	SALEM
২১	মোহাম্মদ শাহজাহান	৪৫	মহিলা	পশ্চিম পাড়	
২২	আমেনা বেগম	২৫	মহিলা	"	
২৩	মাহিনা আক্তার	৩০	"	"	
২৪	জসিম উদ্দিন	৪০	মহিলা	পশ্চিম পাড়	
২৫	হাসিনা বেগম	৪১	"	পশ্চিম পাড়	
২৬	সফিকুর বেগম	২৮	"	পশ্চিম পাড়	
২৯	রহিমুন বেগম	৩৮	"	পশ্চিম পাড়	
২৮	অধ্যাপক মোহাম্মদ আলী	৫৫	পুরুষ	"	

Figure: Attendance of consultation meeting for W23-1

Annexure-03: Pictures of sub-project component location and surrounding features with public consultation













Figures: Present condition of Ratna Palong Haludia Road (W23-1) & Public Consultation meeting with Host community

Appendix-1: Environmental Screening Form for examining sub-project component

Environmental Screening Form for Sub-project W23-1

Sub-Project Description Form:

EMCRP/W23- Improvement of 15 roads and construction of culverts with side drains under Cox's Bazar District

Name of Sub-Project: Ratna Palong Haludia Road Id:422945003

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Estimated total cost of sub-project (in Taka): 417,036,298.10 Tk.

Estimated construction period duration: 1 year

Estimated total cost of the component (in Taka): **21,451,376.45 Tk.**

Estimated Operation and Maintenance period (life of sub-project): Project design life more than 15 (Fifteen) years but Government policies on how long projects can operate in the camps.

District: Cox's Bazar **Sub-District**: Ukhiya **Union**: Ratnapalong and Haldiapalong

Name of Community/Local Area: Khandakarpara, Tekpara, Kotbazar, Ratna(East, West), Classipara

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):

The Sub-Project is categorized as a village road-A with a proposed design of Bituminous Carpeting through construction of Earth Work. **08 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 1100m, Ch. 1188m, Ch. 1413m, Ch. 1519m, Ch.1630m, Ch. 1873m, Ch.2030m, Ch. 2285m, and 01 **nos. Box Culverts** (dimension: 2.0mX2.0m) at Ch. 1362, **779.0 m L-Drain** at different chainage, **100.0m Palisading wall** and **45.0m Toe wall, Road safety** work and **Environmental Mitigation and Enhancement** works are also included. Road safety works are also included in the project activity.

Estimated footprint / land area for this sub-project is 5,904.5 sq. meter

Brief description of sub-project site: (e.g. present land use, Important Environmental Features (IEFs) near site, etc.:

Proposed road is situated within the catchment area of Khandakarpara, Tekpara, Kotbazar, Ratna (East, West) and Classipara Village stretching 1205 meters. This road starts at Jhautola road which runs through bhalukia road and ends at Holudiapalong classipara village. Being one of the local communities of Ukhia upazila these locations are very familiar to any other part of rural Bangladesh having mosques, village households, agriculture fields to grow crops and vegetation that serves as subsistent gardening. The surrounding area is dominated with agriculture practices as rice production, betel leaf production, vegetable farming etc. Majority of the surrounding space of this intervention is covered with homestead gardens and forests. However, there are no significant eco-sensitive features on the pathway of this proposed road.

Overall Comments

The proposed component of the sub-project (Road improvement) is not located within any remarkable environmentally sensitive area and will not cause any severe affect to the environmental settings of the area, thus not going to create intimidation to important environmental features. No drainage congestion/water loggings have been observed in the road area. But, some local trees like betel nut tree, rain tree, mango tree, bamboo bushes etc., or additional vegetation may need to clear out due to construction activities, with appropriate offsetting measures to be taken. No agricultural productive soil will be used for the purpose. Earth will be compacted for stabilization. The inputs will be mainly at construction phase and limited within project boundary. Moreover, mitigation measures will be taken according to the ESMP for minimizing the air, dust and noise pollution.

It has been revealed that this project's scopes of works do not intend to overtake their area of lodgment and funding entity has no intention to do so. Moreover, other issue has also been brought to their attention that drainage system and a bridge have also been included into the evaluation of this project since runoff from higher grounds are also a concerning matter during rainy season.

People of the subproject area are very much optimistic about the success of the project and are also eager to participate in the project activities. The subproject is environmentally sustainable and socially acceptable. The local community attended in the participatory public consultation meeting. Their community representatives as teachers, shop owners, farmers and elders have no objection to the construction this infrastructure in the proposed site; the community also appreciated the initiative of LGED to ensure safe access and better portability. The public consultation meeting results confirmed that improvement of this road will increase socio-economic interest in the communities and make lives easier for these people. They also requested to construct the road in accessible width so that small auto and motor vehicles can pass easily. Water flow from undulated terrains is a factor that should be considered for construction because 1 week worth of rain invites water flow which makes this surrounding area logged in several places. On another matter, locals requested to involve the local community to construction works and material storage monitoring duties.

The road is not located within any identified environmentally sensitive area, and therefore, does not seem to cause any adverse impact on the important environmental features. No significant impact is expected on the ecosystem and biodiversity, no agricultural land/ activities or fish farming will be disturbed, due to the construction of the sub projects. Only forest is found as homestead forest on high grounds of the location.

Types of waste to be generated during construction and operation phase:

During construction period solid waste will be generated due to construction activities. The types of wastes are brick pit, unused sand, wood, gravels, bitumen etc. The types of wastes are gravel, stones, rock, wood, copper wires, concrete, iron, plastic etc. Negligible amount of plastic will come as residue. Moreover, liquid waste will include chemicals of bitumen leftovers, motor oils, used oil, Degreasing solvents etc. Human wastes and kitchen wastes will be generated from labor camps as well.

Sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site including elephant migration routes and remaining forests:

Within the influence area of the subproject no historical sites were identified. Sensitive environmental, cultural, archaeological, religious sites within 1 kilometer of site includes including Darogamora Graveyard/Mosque(500m), Fatematuz zohora Madrassa(500m), Torshakhali khal(500m), Kotbazar Ideal KG School (20m NW) to the North. Matborpara jame Mosque(180m), New Jhautola Mosque(400m) to the south. Ahmadia Rahmania Hefzokhana and Madrassa (180m), Palong High School(200m), Rotnapalong GPS (200m), Rotnapalong Buddhist Mandir(400m) to the east and Households (30m) to the west. Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists.

Human settlements and agricultural land are found around the sub-project area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). Elephant migration routes were about 4-5 km away from this sub-project. No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below

Section A: Sub-Project Overview

Description of sub-project/component interventions:

This intervention will include the following items;

- **08 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 1100m, Ch. 1188m, Ch. 1413m, Ch. 1519m, Ch.1630m, Ch. 1873m, Ch.2030m, Ch. 2285m,
- 01 **nos. Box Culverts** (dimension: 2.0mX2.0m) at Ch. 1362,
- **779.0 m L-Drain** at different chainage,
- **100.0m Palisading wall**
- **45.0m Toe wall,**
- **Road safety** work and **Environmental Mitigation and Enhancement** works are also included (description of such items can be found in BOQ)

Sub-project Location:

Important Features	
ID	422945003
District	Cox's Bazar
Upazila	Ukhiya
Union	Ratnapalong and Holudiapalong
WARD	08
Proposed Chainage	1205m
Road Type	Village Road-A
Proposed Intervention Type	BC
Distance from Upazila HQ	4.5km
Road Starting Point Coordinates and name	Latitude: 21.272540 N Longitude: 92.108180 E Road starts at Jhautola Road
Road Ending Point Coordinates	Latitude: 21.282790 N

and name	Longitude: 92.108560 E Road ends at Holudiapalong union classipara village

Land ownership
Government Land

Expected construction period: 1 Year

Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water bodies, etc. and historical or socio-cultural assets): Please also explain any analysis on alternative location was conducted:

Darogamora Graveyard/Mosque(500m), Fatematuz zohora Madrassa(500m), Torshakhali khal(500m), Kotbazar Ideal KG School (20m NW) to the North. Matborpara jame Mosque(180m), New Jhautola Mosque(400m) to the south. Ahmadia Rahmania Hefzokhana and Madrassa (180m), Palong High School(200m), Rotnapalong GPS (200m), Rotnapalong Buddhist Mandir(400m) to the east and Households (30m) to the west.

Within the influence area of the subproject no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (checked with local IUCN representative).

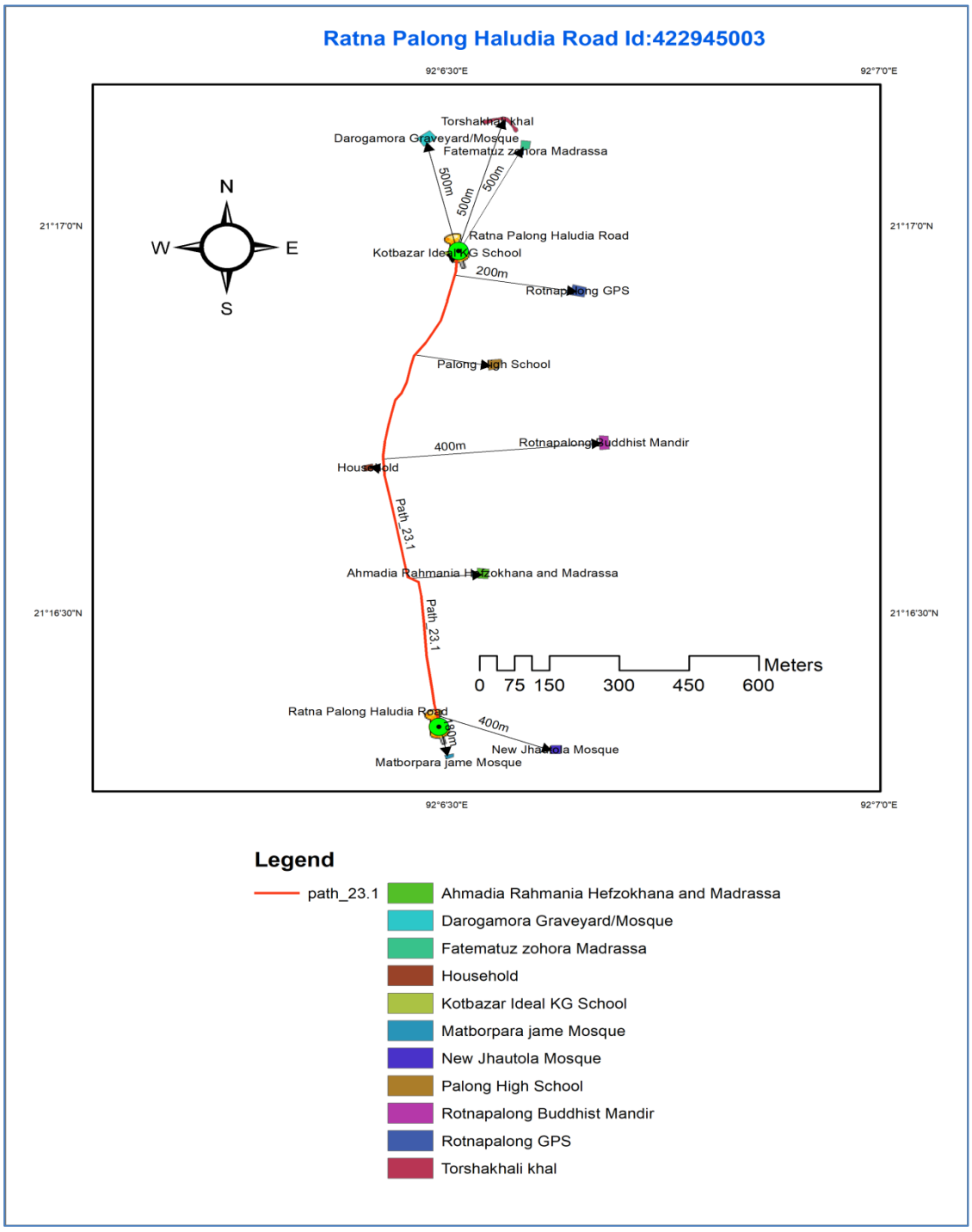
Section B: Environmental Screening
***B.1*: Environmental feature of sub-project location**

Description of cultural properties (if applicable, including distance from site):
Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests:

Darogamora Graveyard/Mosque(500m), Fatematuz zohora Madrassa(500m), Torshakhali khal(500m), Kotbazar Ideal KG School (20m NW) to the North. Matborpara jame Mosque(180m), New Jhautola Mosque(400m) to the south. Ahmadia Rahmania Hefzokhana and Madrassa (180m), Palong High School(200m), Rotnapalong GPS (200m), Rotnapalong Buddhist Mandir(400m) to the east and Households (30m) to the west.

There are no other sensitive environmental, cultural, archaeological sites within the catchment area of this sub-project.

A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas are shown below.



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive features found in the footprint area, except matured vegetation on the sides of the road which are homestead gardens and forest. Several mosques, madrasa and local settlement were found during the survey. It will not be affected by the construction works, as the activities will be carried out within the existing subproject boundary and necessary preventive and mitigation measures will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*
No. There is no existence of Elephant corridor/ route now, which have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) potential impacts on remaining forests in/around camps Yes/No
N/A (This activity will be confined within the existing subproject boundary)

(3) Other issues: N/A

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:
Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of vehicle-related pollutants 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/ preventable by mitigation measures.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, tractor, trailer, etc. move on roads adjacent to sub-project throughout the day and night generate noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation):

Landslide potential is low. There is low possibility of soil erosion or landslide during construction period of targeted sub-project. The impacts are negative but very small scale, site-specific within a relatively small area and adjustable by mitigation measures.

Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH):

Groundwater is the main source of potable water in the Sub-project area. The shallow depth is about 80 feet to 120 feet and deep tube well depth is 800 to 900 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 400-800ft (Field

survey, 2019). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer. Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)
Status of wildlife movement: **N/A** (None of the information was found about the wildlife movement in or across the area)
State of forestation: Patches of vegetation containing large and matured trees are present in local and homestead gardens across the road side of the proposed subproject area which are located within 200m radial distance.
Summary of water balance analysis (For water supply scheme only): **N/A**

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g. status of access road or any other facility required for sub-project to be viable): An access point called bhalukia road is available. It is possible to carry the construction materials on this road to the construction site with limited traffic flow since this road has small corridor to pass large vehicles.
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction: Toilet and water supply facilities will be ensured by the contractor in the vicinity of the construction area for all the components of the sub-project, electric connection will be established with the accommodation facility due for the workforce. Electricity is available in the area.
Possible location of labor camps: Labor camp can be established along the road since there are available open private lands. However, this will have to be done with the consent of land owner under a mutual agreement, with the supervision of the Engineer in charge.
Requirement and type of raw materials (e.g. sand, stone, wood, etc.): i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction.
Identification of access road for transportation (Yes/No):

Yes. An access point called bhalukia road is available as connecting road
Location identification for raw material storage: Adjacent to labor camp or different location is available. However, this will need placement on open fields and should be consulted with local committee. Material storage area must be well fenced and materials will be covered with tarpaulins.
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.): Earth/ mud, plastics, brick chips, dust from bricks during construction of project components will be produce. Also, sludge will be produced from labor camp latrines and kitchen waste mostly composing of organic matters as fiber, starch, carbohydrates and proteins. 10% of the kitchen waste may be classified as plastics or non-biodegradables. Solid waste may amount to 20 kg daily and sludge may amount to 5 kg per day.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g. Solids wastes, liquid wastes, etc.): **Solid waste:** Residual waste from the labor camps will be generated. Equipment maintenance/vehicles on-site and scrap material will occur during construction works which are mostly solid waste. Leftover oils or spills from machinery can be a high probability generating liquid waste. Waste from civil works. And the quantity will be tentatively 150 kg. **Liquid waste**: During construction period fecal sludge will be generated from the labor camp and the quantity would be nearly 6 kg per day, which would be reduced in weight in course of time. Leftover oils or spills from machinery can be a high probability generating liquid waste.
Type and quantity of raw materials used (wood, bricks, cement, water, etc.): **Type:** i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction. **Quantity**: It is difficult to give exact figures of construction waste produced on a typical construction site.
Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards: No such vegetation is present in the right of way. Specific soil amount is not needed for the project. The current condition explains that there is no aggregated soil on the right of way.
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation)

The possibility is Medium, for stagnant water bodies to occur. Because water usage will be higher during the construction period. By default, this area has no water logging troubles due to being natural channels. Moreover, no possibilities of stagnation of water in long run. So, local communities have stated that they do not have severe troubles with mosquitos or other disease vectors.
Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No pre - existing drainage channel.
Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. Because under this intervention, there is very little scope of damage to terrestrial or aquatic ecosystems or endangered species.
Activities that can lead to landslides, slumps, slips and other mass movements in road cuts: Scope of work leading to low scale effects of landslide. The impacts are negative but short-term and site-specific. It can be managed through mitigation measures.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description) Low, since both sides of the road is more or less similar elevation. The concentrated outflow will be managed since the sub-project has included drains.
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: No
Chance of long-term or semi-permanent destruction of soils: (High/Medium/Low with description) No
Possibility of odor and water, soil quality impacts from SWM and FSM disposal system: (High/Medium/Low with description) No
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation)

There is no possibility of stagnant water bodies remained for encouraging mosquito breeding and other disease vectors, during the operation phase.
Likely direct and indirect impacts on economic development in the project areas by the sub-project: Construction or implementation of a road project substantially contributes to the development of the project areas. It surely improves the communication network, reduces the transport time, increases the trade and business in/around the areas, and ensures access to better living conditions with amenities, better educational and job opportunities and health facilities. Thus, the direct and indirect impacts on economic development in the project areas would be enormous by this sub-project.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No existing drainage channels or surface water bodies found in the project area; therefore, no such effect can be anticipated
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. There are no protected areas in or around project sites, and no known areas of ecological interest.
Activities leading to landslides, slumps, slips and other mass movements in road cuts: The entire sub-project component area is nearly flat; thus, no such type of impacts is anticipated.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) No
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: Improved communication will definitely increase the traffic/ vehicular movement, which must increase the light and noise pollution, but air pollution effect will not be increased significantly, as the proposed BC road will reduce the pollution generated from dust on the muddy road, especially during the dry season and if the vehicles are maintained in good conditions

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

Section D: Environmental Screening Summary of the Work Package-W23.1

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
1: Sub-Project Interventions	**Air quality**	Under the subproject intervention the overall score is **low**.	• Limiting earthworks; • Watering of dry exposed surfaces and stockpiles of aggregates at least twice daily, as necessary; • Requiring trucks delivering aggregates or bricks and cement to have tarpaulin cover and Limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Covering of trucks; • Records of air quality inspection;	Visual monitoring of air quality and if requires, air quality test (CO, $PM_{2.5,10}$) once in construction period in winter season.
	Soil impacts	Under the sub-project intervention the overall score is **low.**	• Precautions might be taken when rainstorms are likely, when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms. • The earthwork sites where exposed land surface is vulnerable to runoff shall be consolidated and/or covered. • The material stockpile sites shall be far away from surface water bodies and areas prone to surface run-off. Loose materials shall be bagged and covered. • Channels, earth bunds, netting, tarpaulin and or sand bag barriers	Construction Contractor monitored by Consultant and PIU	• No visible degradation to nearby drainages, • *khals* or water bodies due to soil erosion. • Rain storms in construction phase.	Monitoring as weekly basis.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
			shall be used on site to manage surface water runoff and minimize erosion. • The overall slope of the work areas and construction yards shall be kept to a minimum to reduce the erosive potential of surface water flows elsewhere.			
	Hydrology (surface and groundwater)	Under the subproject intervention the overall score is **low**.	• All precautions to store chemicals/oil/fuel properly so that no chance of spill. • Workers must specify waste dump locations to avoid littering which in turn might negatively affect surface and ground water. • Monitor water quality according to the environmental management plan.	Construction Contractor and monitored by Consultant and PIU	• Areas for stockpiles, storage of fuels and lubricants and waste materials; • Records of water quality inspection; Water Quality Test • (National Drinking Water Quality Standard Parameters)if requires; • No visible degradation to nearby drainages, *khals* or water bodies due to	Water quality test (mainly GW) twice during the construction period in six months interval.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
					construction activities. • Records should be kept and logged.	
2: Pre-construction Phase	**Sanitation, water supply**	Under the subproject intervention the overall score is **low**.	• Provide suitable housing, adequate supplies of potable water, and toilet and bathing facilities within labor camp area for the assigned laborer. • Provide means for disposing of wastewater from toilets, baths and food preparation areas either through a septic tank and soak away, or holding tank with removal by vacuum truck. • Records for any type of training or awareness building sessions must be kept at site.	Construction Contractor and monitored by Consultant and PIU	• Site-specific H&S Plan; • Records of supply of uncontaminated water; • Record of Health &Safety orientation trainings; • Condition of sanitation facilities for workers	Visual inspection by PIU and supervision consultants on monthly basis
	Transportation	Under the subproject intervention the overall score is **low.**	• Contractor should verify vehicles for the suitability of carrying, loading and unloading of materials	Construction Contractor and monitored by Consultant and PIU	• Record of regular inspection. • Record of accidents/incidents	Monthly monitoring.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
	Storage of construction materials	Under the subproject intervention the overall score is **low**.	• Orienting concerned person and team assigned for the construction work.	Construction Contractor and monitored by Consultant and PIU	• List of materials and sources of materials;	During implementation phase, as necessary with discussion with PIU, Consultant
3: Construction Phase	**Wastes**	Under the sub-project intervention the overall score is **low.**	• Prepare and implement on-site waste water runoff and labor camp waste management plan approved by PIU and consultants. • Wastes must be placed in the designated bins which must be regularly emptied. These shall remain within demarcated areas and shall be designed to prevent wastes from being blown out by wind. • All waste must be removed from the site and transported to a disposal site.	Construction Contractor and monitored by Consultant and PIU	• Complaints from community; • Regular inspection of waste management activity; • Waste disposal record.	As work weekly progresses
	Cut and fill Activities (Cutting of hill slope and earth removal from borrow areas caused for soil erosion and	Under the sub-project intervention, the overall score is low.	• During construction cut and fill will be balanced as far as is possible. Designs shall ensure that as far as possible all cut and fill activities are balanced • Proper care will be taken during cutting and filling so that slope or toe of the road embankment	Contractor, environmental specialist of D&SC	• Location of road alignment and slope.	Daily as work progresses

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
	landslides)		remain within the right of way and does not disturb the crop.			
	Storage of materials	Protected and safety storage to be needed for construction materials storage. Not interrupt natural land contours, disturbance in natural drainage patterns and logging of water and the overall score is **low.**	• With the assistance from site management committee in Camp to identify the storage site and other requirements, which will be approved by PIU and consultants.	Construction Contractor and monitored by Consultant and PIU	• List of materials and sources of materials; • Storage areas for materials and equipment.	Monthly basis during implementation phase, as necessary with discussion with PIU, Consultant
	Removal of Vegetation (May cause soil erosion and their deposition on nearby crop field, affecting soil quality and productivity)	Under the sub-project intervention, the overall score is **low.**	• If during detailed design cutting of trees is required, compensatory plantation for trees lost at a rate of 5 trees for every tree cut. • Prevent workers or any other person from removing and damaging any flora (plant/vegetation) and fauna.	Contractor, environmental specialist of D&SC	• Complaints from community;	Daily

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
	Noise pollution	Under the subproject intervention the overall score is **low.**	• Consultation with affected people; not to operate noisy equipment during working period; • No noisy work after 5.00 pm. • Sound suppression for equipment; • Ear protection for workers. • Conduct noise quality monitoring as per EMP.	Construction Contractor and monitored by Consultant and PIU	• Number of complaints from stakeholders; • Use of silencers in noise-producing equipment and sound barriers; • Noise Level following decibel meter (dB)	Inspection by PIU and supervision consultants on monthly basis;
	Air pollution	Under the subproject intervention the overall score is **low.**	• Water spraying for dust control; construction materials with potential for significant dust generation shall be covered; no smoke emitting equipment; and limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor and monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Records of air quality inspection.	Visual observation and monitoring of air quality during construction period.
	Road Safety and Accidents	Under the subproject intervention the overall score is **low.**	• Erection of suitable signage at construction sites • Direct observation and discussion with local people • Restrict the transport of oversize loads. • Operate construction vehicles to non-peak periods (night) to minimize the traffic disruption. • Enforce on-site and access road speed limits.	Construction Contractor, environmental specialist of D&Sc.	• Complaints from communities, pedestrians	Day basis during work time

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
			• The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc. • Local residents should be kept informed about planned Works			
4. Post Construction	**Road Safety**	Under the issue the overall score is **low**.	• Install traffic signs for speed limit, speed breaker where needed, Mile post and create adequate ***traffic*** detours, and sufficient ***signage*** & ***warning*** signs, Post speed limits and suitable bending on the road. • The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc.	Construction Contractor, environmental specialist of D&Sc	• Road signage and safety instruments at suitable locations and chainage	Immediately after the construction work is over.
	Tree re plantation	Under the issue the overall score is **low**.	• Replantation of trees during monsoon period • Maintain of trees properly • Check survival of trees and replant the dead trees	Construction Contractor, environmental specialist of D&Sc	• Number of complaints from stakeholders; • Records of trees number and tree plantation inspection;	Immediately after the construction work is over.
5.	**Maintenance**	Under the issue	• No advertisement/boardings shall	LGED	• Number of	During Operation

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
Operational Phase	**of road and assets** (Road accidents may increase due to higher number of vehicles using the roads at increased speeds)	the overall score is **low**.	be allowed within the Right of Way limits of the project road. • Regular maintenance and cleaning of assets such as sign boards, road safety sign etc. shall be undertaken. • Clear smooth speed breaker/rough surfaces should be clear in views. • Regular maintenance of road surface and shoulders.		complaints from stakeholders;	under LGED's regular maintenance program in each 3 years.

* Overall Impact Score: High = Likely to cause long-term E&S impacts; Medium = Likely to cause temporary impacts; Low = Likely to cause little, short-term impacts

**Post-construction phase denotes the time period contractor use to clear and clean up the sites after the construction work is ended, perform tree plantation, grass turfing, and minor rectification till the official handing over the site to LGED, or owner of the site.

Recommendation for further environmental and social assessment and/or site specific environmental and social management plan: Yes

**If yes, please specify what assessments/plans would be required.* Mention some recommendation on E&S assessment …. ESMP

If site specific environmental and social management plan (ESMP) is followed the impacts can be mitigated and monitored. ESMP is attached.

Appendix-2: Environmental and Social Management Plan (ESMP)

ESMP for Access and evacuation Roads; *(LGED/EMCRP-W23.1):* Ratna Palong Haludia Road Id:422945003

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
Pre-Construction Stage	Loss of land / and other physical assets	• No land acquisition is allowed within this sub-project activities So, there are no any mitigation measures according to this impact.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of livelihood	• Under this subproject, there is no scope of negative impact of adjacent livelihoods	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Stakeholders Engagement	• All of the project stakeholders should be consulted • Separate community level consultation meeting with the potential affected HHs • Consultation meeting with host communities about the project objectives and scope of works	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of right to access	• Project to ensure thorough analysis of alternatives that access enjoyed by the community remains intact. • In case of unavoidable circumstances, alternative access will be provided.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Site Selection & implementing interventions: Human-elephant conflict	• Selection of sub-project sites and all implementing interventions must take place outside of the elephant corridor/influence area.	PIU	Environmental Consultant of PIU, PSC
Pre-Construction Stage	Site Preparation: Soil Erosion; Alteration of natural drainage	• Our selected sites avoided the low land near the water bodies or natural flow path to avoid the flash flood or any kind or surface runoff.	PIU & Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Tubewell location within the construction site is not near to any kinds of latrine and soaks well which could be contaminated by those. • After completing the development we restored the place as like before to avoid the cut and fill operational problems. • This site is in the local community, so we discussed with the local community to avoid any conflicts related local habitation, culture. • Sub project intervention mustavoid of natural disturbance of existing slop and natural drainage. • The contractor ensuring sound environment for the local residents near the sub project site.		
Construction Activity	Noise from construction works	• Construction activities mostly will finish at day time within 05 PM, and must confirm proper measures for avoiding any disturbance. • All Personal Protective Equipments (PPEs) must be ensured in sites before starting any kinds of construction works.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Dust	• Acceptable range of emission of CO, particulate matter [SPM (**Suspended particulate matter)**, PM2.5, 10] and Hydrocarbons must be maintained through good construction work practices • Dust generation must be limited as a result of clearing, leveling and site grading operations with using water florescent manually and through water	Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		pipes. • Dust generation due to vehicle movement on connecting road shall be controlled by watering the path at limited level		
Construction Activity	Safety Issues	• Unauthorized entry is completely prohibited in our site and take necessary measures for preventing this problem • Before works started Contractor must provide proper training and guidelines on health and safety issues to the labors and associated staffs. • Records of every training must be kept at site. • All kinds of Child labour are completely prohibited in every site. • Every construction materials storage site will be well fenced by Tin and safety caution tape.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Traffic Management	• Contractors will maintain proper route for traffic management which is to beconsulted with and confirmed by the Executive Engineer of Cox's Bazar.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Conflicts with existing users due to the scarcity of resource base.	• A detailed assessment of the available resources and consent of the local representative for withdrawal of water from existing surface water sources shall be taken. • If ground water is withdrawn, adequate approvals from the appropriate department need to be undertaken before setting up bore wells. • Any type of consent letter or agreement for	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		withdrawing water from either surface or underground sources will be kept on site. • Local community must be consulted before any construction works starts.		
Construction Activity	Increase in road accidents	• Maintain safety measures during the movement of heavy machinery and equipment. • Local community will be trained up on traffic management and awareness.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Labour Base Camp: Conflicts with the local residents	• Awareness building session will be undertaken about prevention of child abuse, child marriage, GBV, sexual harassment, trafficking of women and children as well as illegal drug trade. Written records of this awareness building session shall be kept on site. • Work force should be prohibited from disturbing the flora, fauna including hunting of animals, wildlife hunting, poaching and tree felling. • Adequate facilities ensuring sanitation for labour camps will be put in place • Treated water will be made available at site for drinking purpose. • Adequate accommodation arrangements for labour forces. • Labor code of conduct is to be disclosed through consultation.	Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Construction Activity	Waste Management: Improper management and handling of	Preparation of a waste management plan covering the following aspects:	Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
	hazardous and non-hazardous waste during construction.	• Residual waste from the temporary accommodation facilities for labor Waste and from equipment maintenance/vehicles on-site • After completion of construction works. So, recycling process is not applicable. • Proper consents for hazardous waste management.		
Construction Activity	Health & Safety Risks: • The potential for exposure to safety events such as tripping, working at height activities, fire from hot works, smoking, failure in electrical installation, mobile plant and vehicles, and electrical shocks. • Exposure to health events during construction activities such as manual handling and musculoskeletal disorders, hand-arm vibration, temporary or permanent hearing loss, heat stress, and dermatitis.	• All construction equipment will be properly inspected timely. • The risk assessment will be prepared and communicated prior to the commencement of work for all types of work activities on site. • Preparation of proper walkways and clearly designation as a walkway has to be ensured; all walkways shall be provided with good conditions underfoot; signposted and with adequate lighting. • Proper Signpost at any slippery areas will be ensured in construction site. • Fire extinguishers will be located at identified fire points around the site. The extinguishers must be appropriate to the nature of the potential fire. • This sub project has Proper communicative emergency response plan (ERP) with all parties, the ERP to consider such things as specific foreseeable emergency situations, organizational roles and authorities' responsibilities and expertise, emergency response and evacuation procedure and personnel will	PIU & Contractor	Environmental Consultant as well as Social Development and Gender Specialists of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		be trained and drilled to test and ensure the coherence with the plan. • All people of construction site will be concerned about the safety and maintenance of Electrical equipment; works will be carried out on live systems. • Provision to first aid box in sub-project areas will be ensured. • Proper Emergency evacuation response plan will exist in sub-project area. • All safety equipment will be available in sub-project site (safety, size, power, efficiency, ergonomics, cost, user acceptability etc.), the lowest vibration tools will be provided that are suitable and can do the works. • Awareness training will be given to all personnel involved during the construction phase in order to highlight the heat related illnesses of working in hot conditions such as heat cramps, heat exhaustion, heat stroke, and dehydration. Written records of this awareness training shall be kept on site. • Adequate quantities of drinking water will be available at all Sites, on different locations within the site. • Provision to maintain proper PPE wherever necessary and to ensure that there are satisfactory washing and changing facilities. • Provision to ensure all workers exposed to a risk are aware of the possible dangers and also given thorough		

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		training on how to protect themselves and there should be effective supervision to ensure that the correct methods are being used.		
Operation &Maintenance	Noise disturbances to fauna	• Provision to maintain noise and vibration from the operation and maintenance of machinery and equipment by proper monitoring and measures. • Provision to take necessary lighting, caution for the works and necessary maintenance should be done in day light.	PIU	Environmental Consultant of PIU, PSC. Union Member
Construction activity	Odours and pollution caused by leaking latrines and faecal sludge, and solid wastes impacting surrounding water bodies, flora and fauna	• Preventative maintenance schedule should be followed. • Solid organic wastes should be stored in bins and/ or skips and emptied regularly at a designated waste disposal area away from the camp site. If no designated site is available within the reach, a dug-hole at a nearby place can be used with periodic filling with soil layer for preventing pollution and generating nutrient rich compost soil over time.	PIU	Environmental Consultant of PIU, PSC. Union Member
Decommissioning during the project implementation period (including site clearance after the construction)	The impacts are similar to those listed in construction stage: • Pollution from waste materials • Health & Safety risks to workers and local community	• Contractor must prepare a demolition and waste management plan including following directive aspects given hereunder.	PIU / Contractor	Environmental Consultant of PIU, and Executive Engineer of Cox's Bazar

Waste Management Plan:

The Contractor shall develop a waste management plan for various specific waste streams (e.g., reusable waste, flammable waste, construction debris, food and organic waste etc.) prior to commencing of construction and submit to LGED for approval. The plans must include following principles or series of actions, which will be carried out/followed by the contractor and supervised by the Field level Environmental Specialist and Social Development Specialist.

For wastes:

- The quantity of waste materials shall be minimized by 3R (Reduce, Recycle and Reuse) approach, and wastes shall be segregated accordingly, wherever practical; and stored in designated places/facilities in the site.
- Construction site shall be maintained in a cleaner, tidy and safe condition and appropriate facilities shall be provided and maintained as temporary storage of all wastes before transportation and final disposal.
- Hazardous waste viz. waste oil etc. will be collected and stored in a paved and bounded area and subsequently sold to authorized recyclers.
- The scrap material generated from related construction activities will be collected and stored separately in the stack yard and sold to local recyclers.
- All wastes generated during construction shall be disposed off in an environmentally acceptable manner. This will include consideration of the nature and location of disposal site, so as to cause less environmental impact.
- Other leftover non-hazardous wastes, including construction debris shall be transported to an approved disposal site by pick up tracks or back loaded vehicles with proper care.
- Organic wastes produced in the camp site during the construction period shall be collected and transported in vehicles covered with tarps or nets to prevent spilling waste along the route to the designated disposal site;
- Burning of any type of wastes in the construction site shall be prohibited completely.

Prepared by: Harogopal Kabiraj, Environmental Focal Person, +8801714980171

Tanvir Ahsan Haque, Environmental Specialist, +8801688117059

Ms. Sadia Azad, Disaster and Climate Change Specialist, PIU.

Reviewed by: Md. Saiful Islam, Field Level Environmental Specialist, +8801913442006

Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.1

In consideration to the above-mentioned environmental impacts and their mitigation measures for all sub-projects, individual BOQ for each component has been prepared. Following tables will illustrate such items of enhancement and impact mitigation works as well as considering the emerged situation of COVID-19, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites.

Sl no.	Description of item	Quantity	Unit price	Total amount
1.	**Grass Turfing** Turfing on embankment top and slope & any critical place with good quality turf supplied by the contractor of not less than 225mm square in dimension including placing and watering till grass is fully grown, etc. all complete as per direction of E.I.C. (Payment to be made only when grass is fully grown)	3615 Sq.m	@38.15 Tk. Per sqm	136050.53
2.	**Dust suppression measures** Dust suppression measures like water sprinkling on aggregates/unpaved roads, in and around the work site and as per direction of E-I-C	1205.0m	@ 2.56 BDT	3084.80
3.	**Water Supply and Sanitation** Providing and maintaining adequate portable water supply, sanitation, cleanliness facilities at camp site and work site to the entire satisfaction of Engineer-in-charge. **Temporary Toilet:** Construction of temporary toilets in work site/ rest area complete as per design and specifications and approved by the Engineer-in-Charge. There should be 1 camp in each site. In each camp, there should be 1 no of toilet for women and 1 no of toilet for men.	2 nos.	@12822.86 per toilet	25,645.72
4.	**First Aid Box** Supplying, equipping and maintaining adequate first-aid box throughout the working period at	1 no.	LS @5000 Tk. Per box	5,000

Sl no.	Description of item	Quantity	Unit price	Total amount
	worksite and site office, and erect conspicuous notice boards directing where these are situated and providing all requisite emergency medical first aid kits, including complying with the government medical or labour requirements at all times, and provide, equip and maintain necessary dressing kits throughout the working period for attending minor injuries, etc. all complete as per requirement and full satisfaction of Engineer-in-charge.			
5.	**Drinking Water Facilities** Providing continuous adequate drinking water supply at worksite and site office as well by installing necessary tube-well/s where applicable or any other means depending on local situation, also providing essential arrangement for storing drinking water by supplying portable best quality water tank equivalent to Gazi/Padma of adequate capacity depending on the number of users, including supplying 1 (one) no. best quality water filter of minimum capacity 30 liters with necessary kits, etc. all complete as per satisfaction and direction of the Engineer-in-charge.	2 no.	LS @ Tk. 30,000	60,000
6.	**Traffic Management** Maintaining traffic management at worksite from time of commencement of contractor's activities to time of completion activities, including ensuring that the road is safe for users, providing a safe working area for those involved in work on trafficked network and minimizing any disruption to smooth flow of traffic (this includes providing necessary barricades, warning signs/lights, guide signs, flagmen, maintaining diversion roads by cutting, filling, constructing, etc. or by any other means) in accordance with the full satisfaction of the Engineering-in-charge.	1 no.	LS @ Tk. 15,000	15,000

Sl no.	Description of item	Quantity	Unit price	Total amount
7.	**Personal Protection Equipment for Workers** Providing and maintaining appropriate (safe design, fit and comfort) personal protection equipment (PPE) to ensure the highest possible protection for employees in establishing and maintaining a safe and healthful working environment at workplace, including demonstrating, providing training on proper understanding and development of skill in the use of PPE, including supplying (i) best quality safety jacket, (ii) suitable hand protection gloves, (iii) appropriate foot protection shoes, (iv) best quality safety helmets, face shields, ear muffs etc. (v) suitable eye protection goggles	LS	LS @ Tk 30,000	30,000
8.	**Tree plantation** Tree plantation to compensate the felled down trees and enhance the ecological condition in the subproject area- preferably local fruits, flowers, medicinal and ornamental trees- Mango, Jackfruit, Jam, Kathbadam, Chalta, Krisnachura, Bokul, Jarul, Polash, Kadom, Shimul, Neem, Arjun, Amloki, Horitoki, Bohera, Mahogany, Palm Tree, Chambal, Rain Tree, Shil koroi, Satim, Sishu (including protection, fencing and conservation during project defect liability period): Preferably at both sides of Road where space is available (fencing as per LGED rate schedule 5.26.14) (Contractors will also be instructed by the consultant and PIU prior to the tree plantation work) at an interval of 10 feet.	50 nos.	@ Tk. 1000	50,000
9.	**Motivation training** Motivation training (twice: before and after construction start) of the Upazila Engineer 'sand Contractor's representatives on safety practice and as per direction of the E.I.C.	1 no.	LS @ Tk. 10,000	10,000
10.	**Waste disposal facility** Temporary camp site waste disposal facility improvement 2 nos. (1 no of organic waste and 1	LS	@ Tk. 5000	5,000

Sl no.	Description of item	Quantity	Unit price	Total amount
	no of inorganic waste disposal facility) and as per direction of E.I.C.			
11.	**Water Test (Drinking Water samples)** Water samples are to be collected periodically (half yearly) from the tube well at labor shed area for laboratory analysis of different parameters such as pH, arsenic, iron, chloride, hardness, total dissolved solids, nitrate, nitrite, coliform, electrical conductivity etc. all complete as per direction of E.I.C. (including the cost of actual fees for testing from reputed laboratory and report) as desired by E.I.C.	LS	@ Tk. 5000	5,000
12.	**Working labour shed:** Construction of Labor shed (Size: 30'x20') with C.I sheet Roofing, Tarza fencing and brick soling floor as per requirement and direction of the E-I-C.	1 no.	LS @ Tk. 30,000	30,000
13.	**Environmental management** Environmental management costs of the Environment & Social/ Safeguard Personnel for Environmental and Social Management and Monitoring during construction and operation phase for their salary & transport (Net payment excluding Tax &VAT). And as per direction of the E.I.C. **(One Safeguard Personnel for R1, R2, R4, R10, & R13)**	1 person	Monthly basis @Tk. 35,000.00 for 12 months. One person covering 5 roads i.e.35,000Tk.*12months*(1/5 one road).	84,000.00
	Subtotal Bill: Environmental facilities			**458,781.05**

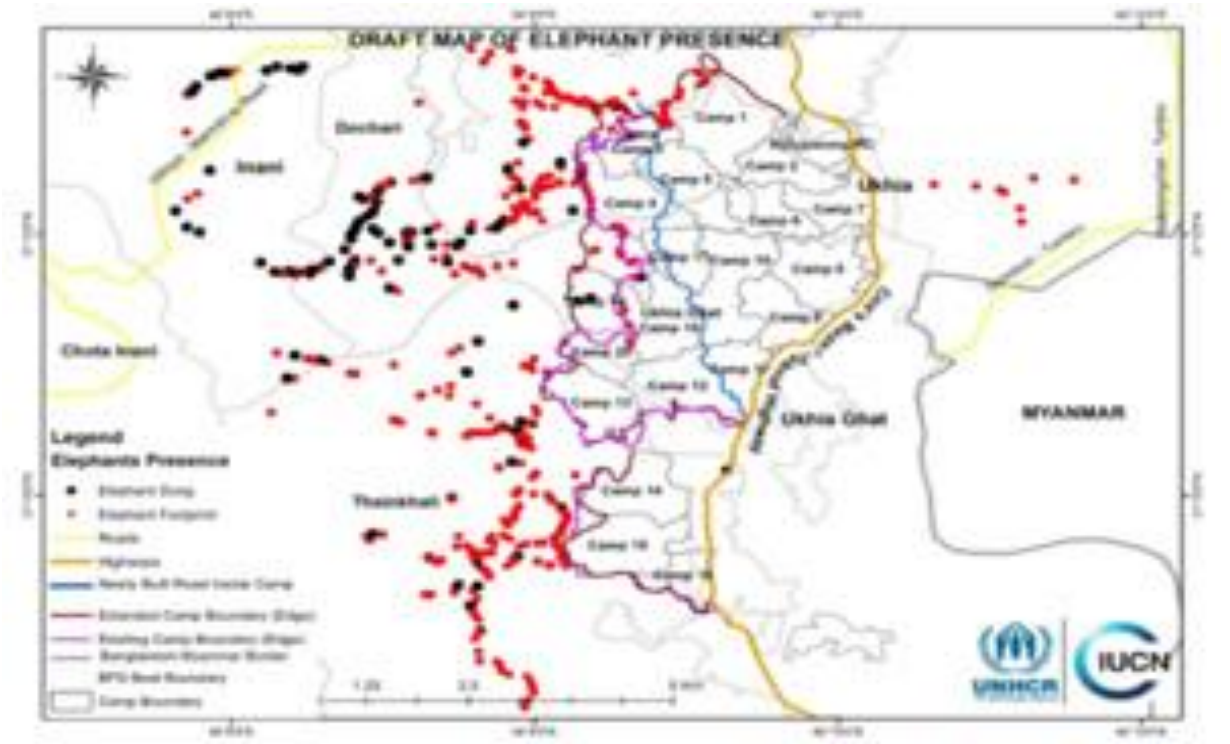
Cost of H&S Measures under COVID 19 Situations for W23-1

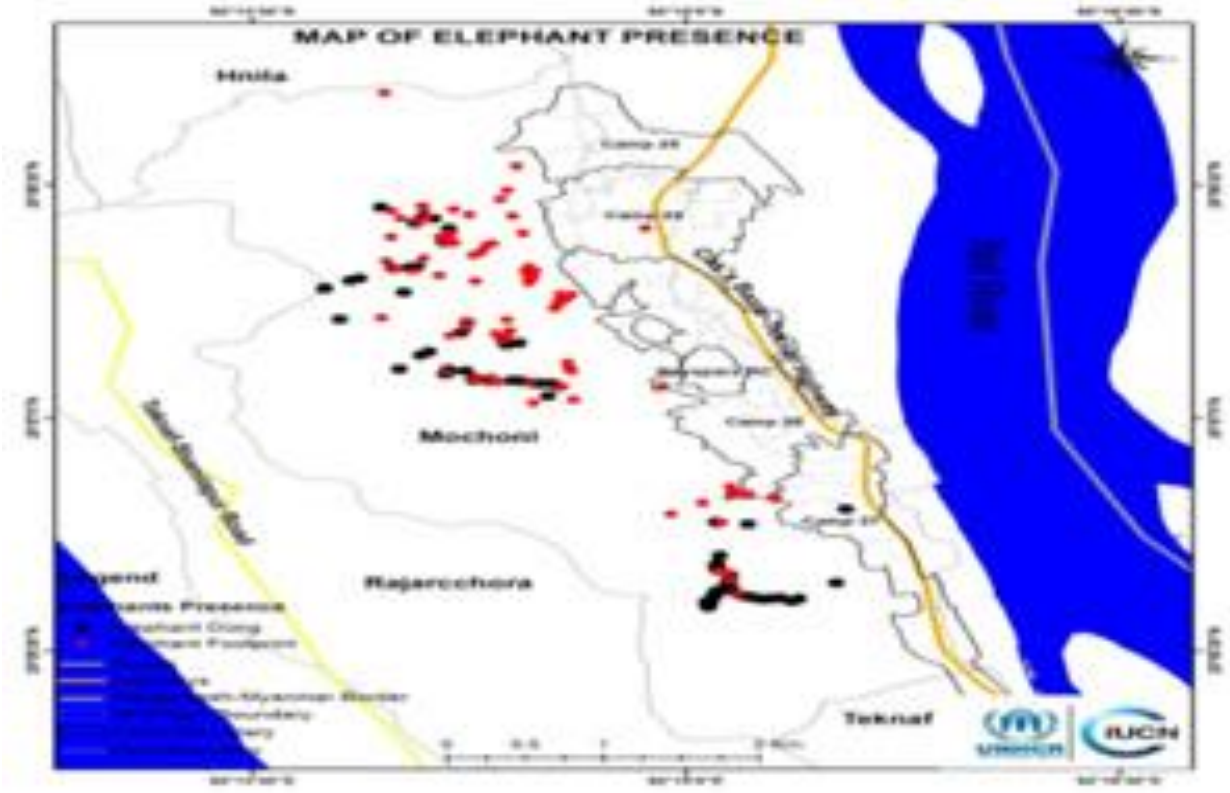
Considering the emerged situation, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites. The cost is estimated counting 25 workers for 270 active working days (9 months in a year) in a contract period for one site under this package (EMCRP/W-23.1).

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
1.	Non-Contact IR Digital Thermometer	01 nos. in each site	N/A	N/A	5,000.00	1	5,000.00	Each site office will have a thermometer for checking body temperature every morning at the entrance of the working site
2.	Wash Basin with Small Water Tank, Bucket and Mug (or piped water supply)	01 nos. in each site	N/A	01 nos. in each camp	10,000.00	2	20,000.00	Wash basin to be installed at favorable locations immediately after the entrance to the facility
3.	Trash bin (covered)/Paddle Bin	01 nos. in each site	N/A	01 nos. in each camp	550.00	2	1,100.00	
4.	Bar Soaps (150 gm each)	68		85	50.00	153	7,650.00	To be placed in a case/holder on the basin, for washing hands for max. 39 people a day and showering of 34 workers in each labor camp.
5.	Hand Sanitizer (2 nos. 250 ml bottle and 5 liter Can for Refill)	2 bottles and 1 Can for each site	N/A	N/A	4,000.00	1	4,000.00	2 bottles and a 5 litre can for each Site office
6.	Face Shield/ Protective Safety Goggles	15 nos. for each site		N/A	400.00	15	6,000.00	For labors who work in close contact, 15 in each site

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
7.	One time Mask (Disposable) for Contractors' Staffs	5 nos. each day in each site		N/A	12.00	1350	16,200.00	Reusing N95/KN95 mask will not be a manageable option in field scenario, one time disposable medical/surgery mask a good option instead.
8.	Cloth mask for Workers	N/A	25 nos. for each labor camp		35.00	450	15,750.00	A worker will use a mask for 15 days with everyday washing
9.	Floor Cleaner (1 litre Can)	1.5 Can	N/A	4 Can	250.00	5.5	1,375.00	
10.	Detergent Cleaner	N/A	1.750 kg in each camp/month		400.00	15.75	6,300.00	To be used for washing clothes, masks and tools & equipment, etc.
11.	Miscellaneous cost				20,000.00	1	20,000.00	Contingency cost for medical emergency and compensation for workers, subject to proper documentation
	Grand Total						**103,375.00**	

Appendix-4: Elephant Migration Routes Map





Elephant presence map (latest information published on 24 May 2018)

Appendix-5: Location Map of Sub-project for W23.1

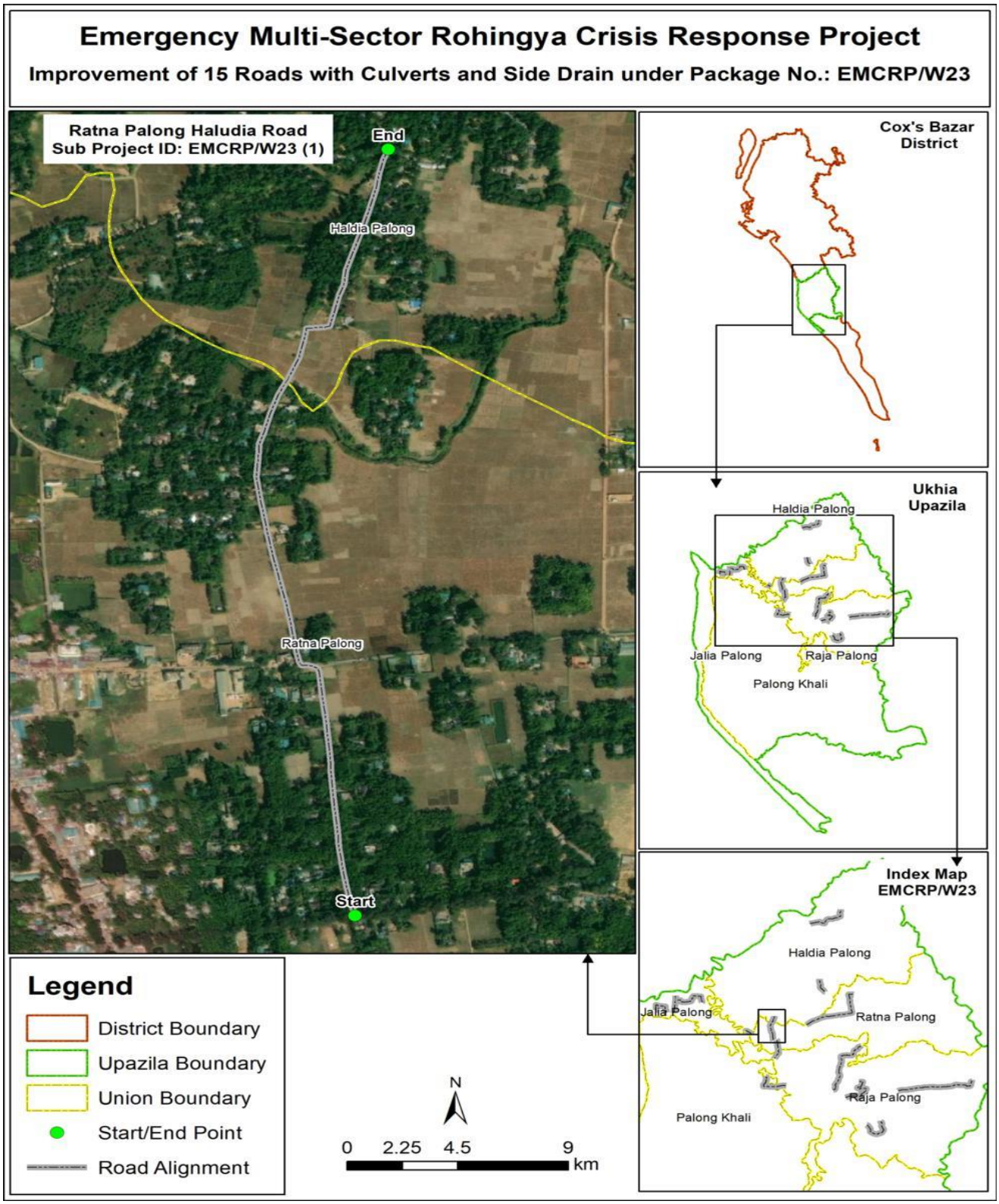
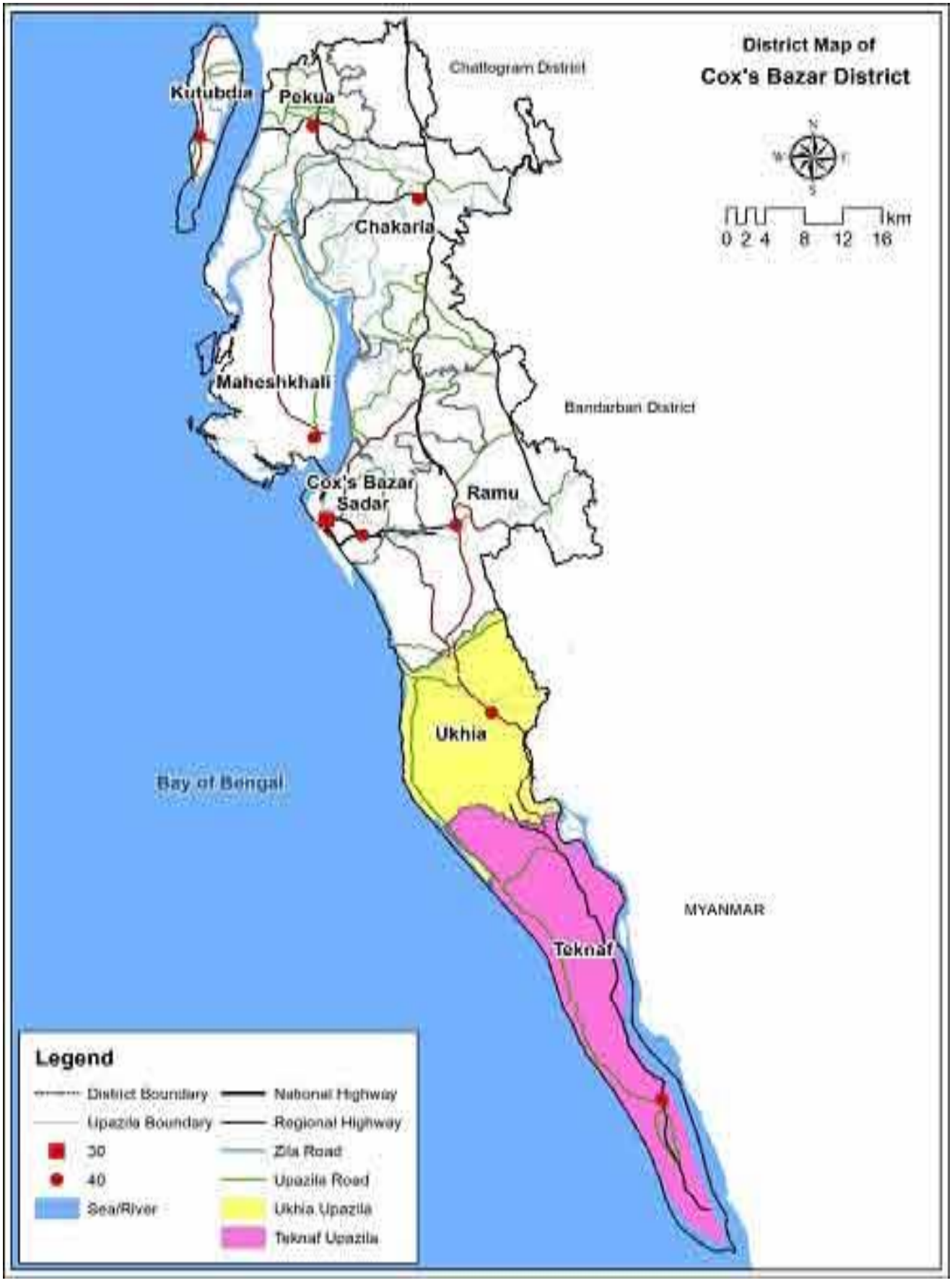
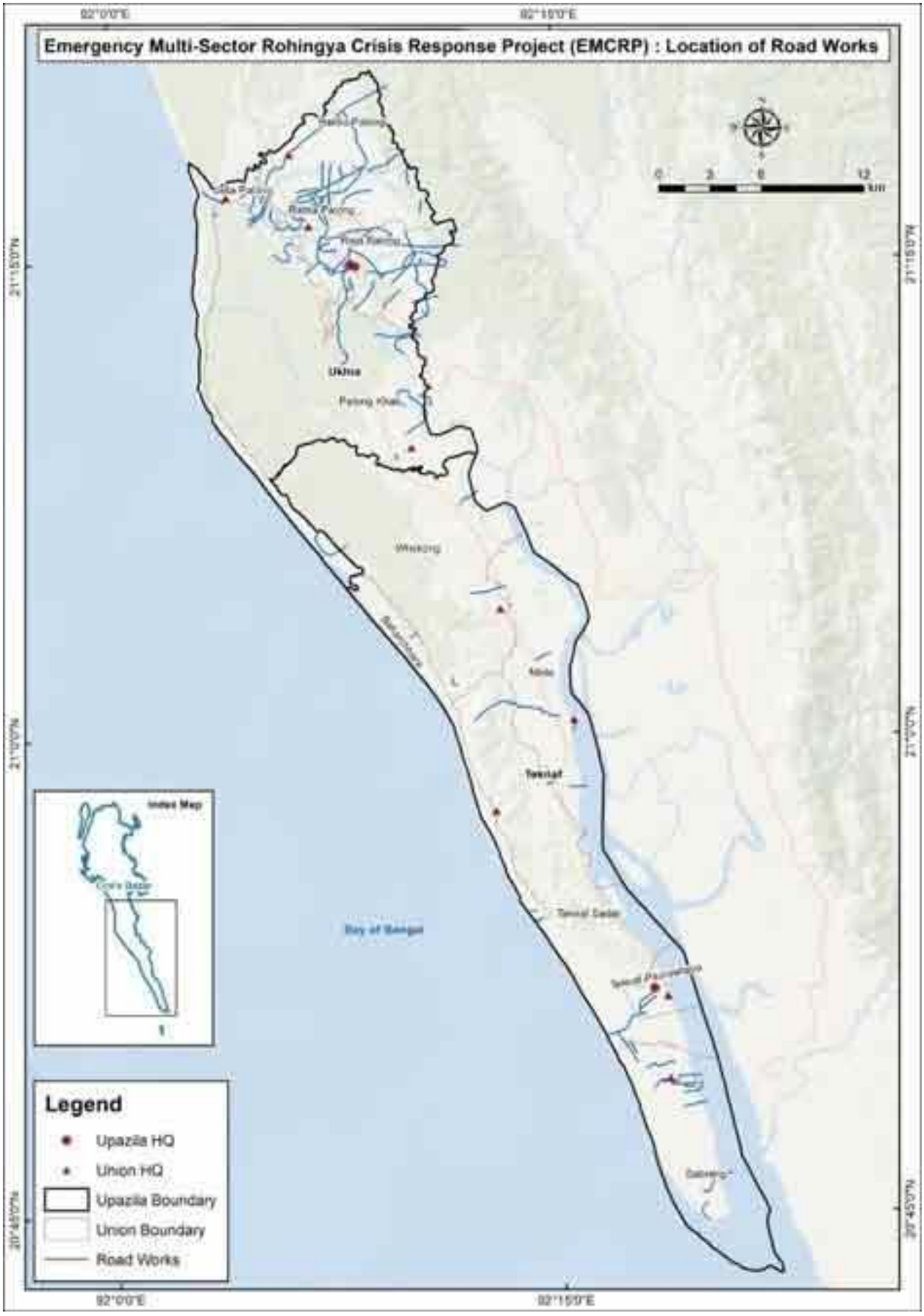


Figure: Location Map of W23-1



District map showing Ukhiya and Teknaf Upazila



Upazila map locating proposed road

GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH
Ministry of Local Government, Rural Development and Co-operatives
Local Government Division
Local Government Engineering Department

Emergency Multi Sector Rohingya Crisis Response Project (EMCRP)

Project ID: P167762 **IDA Credit No. 5561-BD**





Environmental Screening Report

For Jautola Bhalukia road with culverts and side drain under Cox's Bazar District.

Under the package no. EMCRP/W23

Funded by:

THE WORLD BANK
IBRD • IDA

Government of the People's Republic of Bangladesh & World Bank

Design and Supervision Consultancy:

Development Design Consultants Ltd.

October-2020

Contents

1. INTRODUCTION 1

1.1 Project background 1

1.2 Elementary information of Work Package Component of W23.2 2

1.3 Proposed intervention items of sub-projects 5

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS 5

2.1 Methodology 5

2.2 Important features/establishments within the PIA 6

2.3 Issues and Recommendations raised by the Participants in regards to component interventions for W23.2 8

3. ENVIRONMENTAL SCREENING 10

3.1 General 10

3.2 Major Findings 10

3.3 Climate Change Impact Screening 13

3.3.1 General Overview of the area 13

3.3.2 Site Specific Screening and outcome 14

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) 15

4.1 General 15

4.2 Health and Safety Measure under COVID Situation 18

4.3 Cost of Environmental Enhancement Works in BOQ 18

5. LIMITATION OF THIS STUDY 19

6. CONCLUSION AND RECOMMENDATIONS 19

Annexure-01: Important Environmental Features (IEFs) near site: 20

Annexure-02: Attendance of consultation meeting 21

Annexure-03: Pictures of sub-project component location and surrounding features with public consultation 22

Appendix-1: Environmental Screening Form for examining sub-project component 23

Appendix-2: Environmental and Social Management Plan (ESMP) 40

Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.2 48

Appendix-4: Elephant Migration Routes Map 54

Appendix-5: Location Map of the Sub-project component 55

ACRONYMS

BOQ	Bill of Quantities
BFS	Brick Flat Soiling
D&SC	Design and Supervision Consultant
DoE	Department of Environment
DRP	Displaced Rohingya people
EA	Environmental Assessment
EC	Electrical Conductivity
EMCRP	Emergency Multi-Sector Rohingya Crisis Response Project
ESMP	Environmental and Social Management Plan
ERP	Emergency Response Plan
ESMF	Environmental and Social Management Framework
FDMN	Forcibly Displaced Myanmar National
FGD	Focus Group Discussion
FSM	Faecal Sludge Management
GBV	Gender Based violence
GPS	Government Primary School
GRM	Grievance Redress Mechanism
HBB	Herring Bone Bond
IEFs	Important Environmental Features
ISCG	Inter Sector Coordination Group
IUCN	International Union for Conservation of Nature
IWM	Institute of Water Modeling
LGED	Local Government Engineering Department
PIA	Project Influence Area
PIU	Project Implementation Unit
PMU	Project Management Unit
PPE	Personal Protective Equipment
PSC	Project Steering Committee
SMC	School Management Committee
SPM	Suspended Particulate Matter
SWM	Solid Waste Management
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
UNHCR	The United Nations High Commissioner for Refugees
VAT	Value-Added Tax
WB	World Band

1. INTRODUCTION

1.1 Project background

An estimated 730,000[1] people of Rohingya community has fled to neighboring Cox's Bazar district of Bangladesh since August 25, 2017 to escape extreme violence in Rakhine State of Myanmar, which caused the total number of Forcibly Displaced Myanmar National (FDMN) in the district to be about 923,033[2]. This huge number of displaced population account for about one-third of the total population of Cox's bazar, a district which was already facing many development challenges and suffering from resource-constrained social service delivery system even before the crisis evolved and the mass exodus of FDMN has worsened the situation further. Almost all of these displaced people are hosted in Ukhiya and Teknaf Upazila of Cox's Bazar, in extremely congested settlements in areas having very minimal access to basic infrastructure and services and is prone to natural disasters. The Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP) has been designed in order to reduce the vulnerability of Forcibly Displaced Myanmar National (FDMN) along with people from the host communities in Teknaf and Ukhiya Upazila under Cox's Bazar District, to different disasters and improve the social service delivery system and disaster resilience to both the communities. This project will follow a sustainable development pathway that is resilient to disaster and climate change effects.

The objective of the Project is to provide greater protection for the FDMN and host communities through:

- Reducing the vulnerability to natural disasters
- Improving social service delivery system and providing better communication facility through physical interventions
- Improving water and sanitation facilities
- Reducing vulnerability to accidental fire
- Provisioning better educational facilities and
- Strengthening and scaling up of GBV prevention services to the FDMN

The project is jointly being implemented by Local Government Engineering Department (LGED), Department of Public Health Engineering (DPHE) and Ministry of Disaster Management and Relief (MoDMR) under their respective mandate and scope of works. Apart from the interventions in Addressing Gender and Social Inclusiveness and Preventing Gender Based Violence with the Support from UNFPA and building Communication and Awareness among all affected parties through an effective engagement of BCCP (Bangladesh Center for Communication Programs) in the areas, LGED is implementing a good number of infrastructural facilities, namely improvement of hat bazars, roads (both inside and outside of the camps), bridges, culverts, construction of School cum multi-purpose disaster shelters, Satellite Fire Stations, Relief Distribution Center, Community Service Center and many other different types of facilities. Given the project interventions, sensitivity of the areas and volume of people in or around the sites, the project is more likely to trigger certain Operational Policies and Bank Procedures, namely Environmental Assessment (OP/BP 4.01), Natural Habitat (OP/BP 4.04), Forest (OP/BP 4.36) and Physical Cultural Resources (OP /BP 4.11).

[1] ISCG: Situation Report Rohingya Refugee Crisis, (September 27, 2018)
[2] IOM Needs and Population Monitoring round 12 as of October 10, 2018

1.2 Elementary information of Work Package Component of W23.2

It is imperative to recognize proposed components under Work Package-23.2 in Ukhiya Upazila in order to assess and verify its interventions according to stipulated screening requisites from WB. Acknowledging this matter, such details are accounted for as given below in Table 1.2.1 along with visual presentation (General Upazila Map) given in Figure 1.2.1. Aerial maps for each sub-project is given in Appendix -5.

Table 1.2.1: Basic Featured Information of components [Sources of data: Field survey, 2020: DDC & LGED]

COMPONENT'S NAME UNDER W-23	GPS COORDINATES	DISTANCE FROM UPAZILA HQ	UNION	WARD	LOCATIONS UNDER PROJECT INFLUENCE AREA	PRE-EXISTING CONDITION OF ROAD	PROPOSED ROAD TYPE	ROAD DIMENSION(M) (LENGTH X WIDTH) = FOOTPRINT (SQ.M) *
Jautola Bhalukia Road Id:422945004	**Starting Point** $21^0$16'21.6" N $92^0$06'34.2" E **Ending Point** $21^0$15'52.7" N $92^0$06'31.1" E	6 Km	Ratnapalong	7, 8 & 9	Tekpara, Telipara & Shadrikata	BFS, HBB	Bituminous Carpeting (BC)	(810m X 4.9m) = 3,969 sq.m

*Note: Roads are proposed to have average carriage way of 3.7m with 0.6m shoulder on each side; special conditions may prompt further adjustments while in construction period. However, footprint for roads are calculated with an average of 4.9 meters.

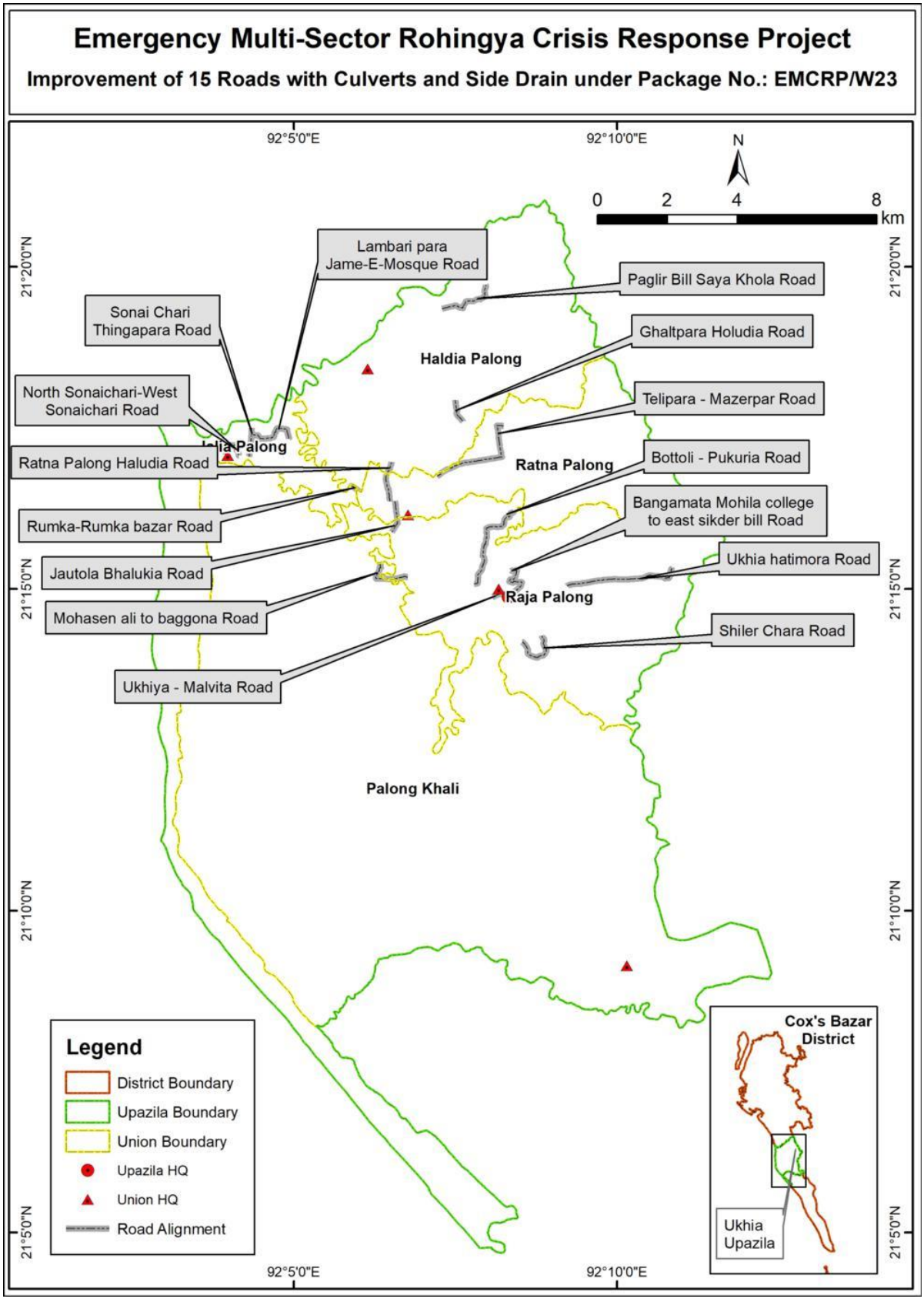


Figure 1.2.1: Map illustrating Roads of Work Package EMCRP/W23 locations in the Ukhiya Upazila

1.3 Proposed intervention items of sub-projects

The roads under work package 23.2 have been proposed with specific need basis dimensions to accommodate and ensure best quality interventions for local stakeholders. In context of governing environmental circumstances and geo-meteorological conditions, protection work items have been added to construction design for safety and sustainability of each proposed roads. These roads are abutting agriculture hence, construction and improvement works will descent these roads into new circumstances in some parts. These items have been included on the basis of field survey and analysis of these conditions. Please follow the table to acknowledge these items.

Table 1.3.1: Proposed safety interventions of sub-project for W23.2

W23-2: Jautola Bhalukia road Id:422945004
Construction of 07 nos. Cross Drain (dimension: 0.975mX 0.975m) at Ch. 141.0m, Ch. 155.0m, Ch. 262.0m, Ch. 294.0m, Ch. 355.0m, Ch. 477.0m & Ch. 642.0m of chainage and construction of **01 no. Box Culvert** (dimension: 2 vent: 4.50mX4.50m) at Ch. 800.0m of chainage, construction of **44.0m Toe wall** at different Chainage, Construction of **Earth** works, **Road safety** works and **Environmental Mitigation and Enhancement** works. Description of Environmental Mitigation and Enhancement works can be found in BOQ attached in Appendix-03.

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS

2.1 Methodology

Public participation and community consultation have been taken up as an integral part of environmental assessment process of the project. As part of the impact assessment, participatory public consultation was conducted in areas of concern for proposed road by the field level staffs and consultants from PIU and D&SC. The consultation meeting was attended by disparate social groups representing local habitants, separate age groups, social class and occupations. In some cases, IUCN employees in charge of elephant watch tower were present where frequent elephant movements occur. The participants were also selected from different segments of stakeholders, and some of whom will have major active roles before, during and even after the construction works. Therefore, the meeting was organized in an informed, expressive and unbiased manner, wherefrom different views and concerns came across which will be properly taken care of during the design and construction phases. In order to serve our screening process, relevant items were thrown towards the audience to discuss and troubleshoot confusing or worrying matters regarding the proposed intervention under package work. Impacts in regards to environment, socio-economic matters during pre-construction, construction and post construction phase has been put forth. Possible mitigation measures and relevant needs have turned out during these sessions as well. Moreover, their comprehension as a stakeholder has been up lifted in light of project guidelines.

However, public consultation is a living process as the types of problems/ difficulties, involved parties or stakeholders and mode of settlement or resolution processes are more likely to differ with time. Thus, consultation with different parties or stakeholders will be continued throughout the sub-project implementation period and records of resolutions, whatsoever and wherever possible, will

be kept in writing at the site and made available on any enquiries or requests by all parties concerned.

All components under the work package have been put through review for locating impediments or possible adversity effecting future environment and socio-economic conditions. In order to comprehend surrounding features and impacts which may stipulate with it, screening has acknowledged having a Project Influence Area (PIA) of 0.5-kilometer radius. Sensitive findings have been identified if any, and relevant mitigation or minimization measures were suggested to subdue such complication for over the project construciton period. Moreover, evaluation was inspired to enhance environmental features and include monitoring initiatives under ESMP budget to ensure exertion of environmental improvement propositions. Contractor's responsibility has been taken into account while identifying possible impacts through sets of intervention accounts. These steps have been initiated strictly following ESMF guidelines and requirements. Environmental screening procedure was motivated by ingredients highlighted in Appendix-2 of ESMF. During survey, detail chainage length of the sub-projects was taken into account for detailing environmental and socio-cultural features within 100 meters buffer zone of both Left and Right side from the center line of the road. Longitudinal intervals of 300 meters have helped to identify positions of sensitive or near-sensitive socio-cutural features. These findings are illustrated in **Annexure-01**.

2.2 Important features/establishments within the PIA

Initial screening process is conducted through direct involvement of PIU and D&SC in the influence area of the proposed component, which allows to raise significant questions and ideas towards participants. In combination of both field walk-through and inputs of audience, a register of existing features is formed. Allow the following table to describe such elements in all the work package components.

Table 2.2.1: Important features within Project Influence Area for W23.2

Component's name under W-23.2	Direction	Important features/ establishment (approx. distance from the proposed site)
Jautola Bhalukia road Id:422945004	North	Ratnapalong UP (800m), East Ratna Moitri Buddhist Temple (850m)
	South	Reju khal (15m), Tuturbill GPS (700m), Tuturbill jame mosque & graveyard (300m), Tuturbill Central Jame Mosque & Graveyard (450m)
	East	Baitun-nur-Hakim Ali mosque (300m), Telipara mosque & graveyard (400m), Palong garden community center (200m), Hijolia khal (500m)
	West	Madborpara jame mosque (15m), Shadrikata jame mosque (10m), Courtbazar (500m)

2.3 Issues and Recommendations raised by the Participants in regards to component interventions for W23.2

After inauguration has set in motion, their valuable opinions and remarks came pouring out. At this point, we find our field base knowledge for assessment attributed impact degrees and possibilities. Please follow the table 2.3.1 given below to recognize participants' inputs arranged in relevance with this component. Consultation meeting summary, attendance sheets and pictures of separate meetings with proposed location for this sub-project component can be found in Table 2.3.2 and Annexure-02 and Annexure-03 respectively.

Table 2.3.1: Issues and Recommendations raised by the Participants

COMPONENT'S NAME UNDER W-23.2	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
Jautola Bhalukia Road Id:422945004	•They are very much concerned with absence of reliable path route in Tekpara, Telipara and Shadrikata villages area. • In case of emergency conditions such as ambulance services cannot reach these locations. • Heavy transports are prone to accidents due to bad road conditions. •Possible dust and noise pollution during the construction works. •Safety of children and adults at the sites during construction works. •Elephant movement is not present. •Local community wish to have a better drainage system along with the road in order to allow waters from undulated terrains to find an uninterrupted pathway not causing harm to agriculture fields and wash away top soil of adjacent grounds residing alongside the road. It will protect the top soil for future growth of crops and aid vegetable farming. •The participants have expressed their greater interest for this intervention and believes this will bring nothing but prosperity for the entire catchment dwellers. •Household boundary fences along the road should not be affected while construction • No trees should be harmed for improvement of this road	• Local people considered that the selected site is suitable for the construction of this road from both the technical and social-environmental (direct savings in the cost of operating vehicles, time savings by travelers and freight, wider effects can less accident rates, road being waterproof and dust free, much more durable) point of view. It will provide better mobility and access to services in due time. •The road should consider water flow during rainy seasons thereby ensuring the construction is not affected by mass water flow. •Enough pathway is expected for vehicle movement so that comfort travel is achieved. •Construction site safety should be ensured to avoid any mishaps or accidents during work periods. •They also requested to involve the local community to construction work and they will welcome any outside key labor. •During construction period, alternate route to pass through this area is available. •Since the road is passing alongside homestead gardens and agriculture fields, the intervention will invite air pollution on moderate level during construction period. However, preventive actions and measures can be taken to keep air quality from degrading. •Women should be recruited equally, wherever possible. •They have also ascertained that the selected site is free from any events related to resettlement and major environmental impacts. The adverse environmental impacts that may come in the way of air quality, noise, solid waste, occupational health & safety during the construction period, and will be of short duration, yet proper

COMPONENT'S NAME UNDER W-23.2	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
	• Available pathway to usher material delivering vehicles • Labor shed availability in the target location •Identification of material storage location based on consultation with local communities	management/conservative options should be adopted. • On the alongside of the proposed improvement road since there are available open private lands are used as labor shed and material storage can be arranged • Nearly significant BC road called Telipara connecting road, Jhawtola connecting road and Muktijodha Shomsher Alom Chowdhury connecting road are available for Concerning ancillary access. Construction raw materials, access road for alternatives transportation and possible traffic movement will be used as these significant connecting roads

Table 2.3.2: Consultation Meeting Summary

Road Package Number	Date DD-MM-YYYY	Venue	Main Participant Groups	No. of Participants	Remarks (If any)
W23-2	06-10-2020	Shadrikata Kamal's Shop	Host Community	13	The local individuals, elites, chairman and/or member of respective Union Parishad, representatives from different agencies participated in those consultation events.

3. ENVIRONMENTAL SCREENING

3.1 General

This section identifies the potential impacts that the various elements of the proposed Project may have on the physical, biological and socio-economic environment within half a kilometer of the radial distance around the site. Environmental Assessment (EA) based on this screening study for the Sub-project has been conducted to identify and determine which potential Project impacts may be significant and therefore require the application of reasonable and effective management and/or mitigation measures.

In order to realize the exact physical, biological, socio-economic and environmental impacts of the proposed sub-project sites and the influence area in regards to the implementation measures, an extensive field visit was carried out in each proposed sub-project PIA. Environmental Screening form, as adopted in **Appendix 2** of the Environmental and Social Management Framework of EMCRP, was administered for identifying the impacts and their extents.

The screening data and information for this sub-project component and details screening summary have been formulated and shown in **Appendix-01.**

3.2 Major Findings

A complete view of current environmental conditions of individual sub-projects in relation to interested queries has been congregated in order to understand the degree of impacts corresponding with marked interventions. Interestingly, most sub-project has correspondence with its surrounding features and upholds interchangeable impacts. However, the degree is not an interchangeable factor since scale is not parallel to each of these components which is where, mitigation measure differentiation is implied. There are some cases where unique circumstances have been met with while environmental screening took place which is also accounted for and should be a matter of concern for other parts of the ESMF initiative. The significant issues observed for this sub-project component is enlisted in following Table 3.2.1 with pertaining impacts. Moreover, impacts that are adventitious has also been embraced for promoting best practices.

Table 3.2.1: Concerning environmental issues relating to each proposed subproject and influence area for W23.2

COMPONENT'S NAME UNDER W-23.2	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
JAUTOLA BHALUKIA ROAD ID:422945004	It is not located within any major environmentally sensitive area.	It will not cause any severe negative effects to the environmental settings of the area neither to important environmental features.
	Construction period will induce air pollution while preparing for bitumen and loading-unloading raw materials. Impacts on air quality during the construction phase may turn to negative. The main impacts include dust generation from crushers, vehicles and the transportation of all types of construction materials.	It will invite waste production which may in turn cause minor air pollution due to deposited dust and airborne particles less than PM_{10}. Dust pollution may slightly suffocate photosynthesis however this can be minimized through regular water sprinkling as suggested in ESMP.
	Noise emission from construction machineries and equipment can cause nuisance to local residents and workers.	The ambient noise level might have potential to increase temporarily and intermittently in the close vicinity of active construction fronts.
	Paddy land, boundary fencing and significant vegetation coverage is located in the ROW or does it stand over such items. However, trees, electric pole, household connecting road and homestead gardens are found beside the road.	No agriculture land or any forest coverage will get degraded or lost for construction. Liquid waste such as left-over oils or chemicals might run into these adjacent features.
	Few amounts of bush (sapling) clearings may need cutting at different chainage.	No severe damage will occur or damage to habitat will be faced. It can be managed by introducing small plantation incentives around the proposed location.
	Elephant Movement is not present in the vicinity of the subproject location.	No impact is expected
	No heavy earth excavation work will be involved.	Consequently air, noise and dust pollution will be occurred within a small-scale during construction period only.
	Construction related activities and setting up of labor camps along with associated facilities and their management can cause adverse impacts.	Noise pollution from mixing or grinding, air pollution caused by dust or gaseous emissions from vehicle movement, running of motorized equipment and land clearing, odors and soil pollution from leaking of latrines and fecal sludge, will more likely to take place.
	Chemical spills or improper disposal of construction waste materials due to lack of worker training and misconduct of contractor's safety initiatives.	During the construction period, soil may get contaminated from activities such as handling of hazardous construction materials (such as fuel, lubricants, paints, and solid waste and sewage).
	Vibration effects generated from grinding, mixing, drilling or other construction works	Any vibration would result in nuisance effects to nearby faunal species, and but will be localized and temporary and will unlikely to result in structural

COMPONENT'S NAME UNDER W-23.2	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
		damages to buildings or walls of the adjacent private properties.
	Sensitive environmental, cultural, archaeological, religious sites within 1 kilometer of site including at north side Ratnapalong UP (800m), East Ratna Moitri Buddhist Temple (850m), at south side Reju khal (15m), Tuturbill GPS (700m), Tuturbill jame mosque & graveyard (300m), Tuturbill Central Jame Mosque & Graveyard (450m), at east side Baitun-nur-Hakim Ali mosque (300m), Telipara mosque & graveyard (400m), Palong garden community center (200m), Hijolia khal (500m) and west side Madborpara jame mosque (15m), Shadrikata jame mosque (10m), Courtbazar (500m).	No disturbance to all these establishments/features is anticipated due to construction activities for the sufficient distance from the construction site, and strict construction site management system- including restrictive work schedule during the daytime only, water-sprinkling twice a day on and around the site, safe storage of materials, etc.

A few incidents of human elephant conflict have been reported in 2018. The IUCN has conducted a study on such conflict. With the support from UNHCR, IUCN has been marking elephant routs and corridors and informing local communities and stakeholders of avoiding the marked areas. As part of the mitigation options, different initiatives have been undertaken, such as formation and capacity development of Elephant Response Teams (ERTs); providing equipment to ERTs to divert in-coming elephants; and setting up elephant deterrent tools (e.g. trip alarms and watch-towers). Though the current chances of occurrence of conflicting incidence are zero, any recurrence would be managed by the ERTs and they will be called if there appears any minute possibility to recur. A map of elephant movement is given in Annexure 04.

In order to offset the loss or attenuating the environmental degradation, a set of mitigation measures will be adopted, on top of general practice of standard construction procedure or following the relevant codes of practices.

3.3 Climate Change Impact Screening

3.3.1 General Overview of the area

Cox's Bazar is one of the coastal districts of Bangladesh and is prone to the effects of climate change due to its geomorphological siting and climate induced effects. The hilly tracts of Cox's Bazar could foster further environmental crisis brought on by indiscriminate deforestation and diminishing groundwater reservoirs, which have been taken place in recent months as the Rohingya crisis evolved. A recent study conducted by World Bank[3] has found that Cox's Bazar will be the worst-hit district in South Asia as average temperatures rise and rainfall patterns become disruptive, by 2050, if greenhouse gas emissions continue unabated.

The hilly region of the country, especially the part in Cox's Bazar is characteristically of muddy soil structure, not of any rocky formation and the stability comes from the roots of the trees. Also rainfall, proximity to the sea, elevation, and land cover are very important factors for analyzing the risk of cyclone. Denudation of trees from hilltops in order for the huge settlement of Rohingya people has already increased the vulnerability to the risk of hill collapse by destabilizing the terrain. Also deforestation at a rapid speed uncovers the land and raise the risk of occurrence of cyclones, as forests protect land from high wind and storm surges where demolishing the trees would make the area vulnerable.

Together with the above-mentioned hazardous situation, again due to sudden extraction of huge amount of groundwater, availability of potable water from shallow tube wells that pump water up from about 150 feet has already reached to a critical level. Averting the problem requires new tube wells to be plumbing deeper into the poorly mapped aquifer, but going deeper than 700 feet in some places may cause salt water to contaminate freshwater resources.

In this case, it is possible that a stationary position of the freshwater-saltwater transition zone can be established via proper management of pumping in the confined aquifer.

The groundwater resource is seen to suffer more from the climate change impact. The impact on groundwater due to climate change impact include

- Sea-level rise could result in a transgression of the sea and a loss of land area. This could also lead to the secondary effect of population migration in the new coastal band due to migration of the coastal population from the encroaching sea, thereby increasing domestic water needs in the new coastal area.

- Transgression of the coast implies that saline storm surges of 1 or more meters depth would penetrate beyond the new coast to new land areas. Storm surges transport saline water far inland of the coast and much of this floodwater may infiltrate the ground in areas where the aquifer is not fully saturated. Even where the aquifer is saturated, denser saline water may

[3] https://openknowledge.worldbank.org/bitstream/handle/10986/28723/9781464811555.pdf

sink into the aquifer during the flood and later from pools of saltwater that remain following the flood[4].

- It has been identified that the salinity is found in the shallow aquifers along the coastline. So the salinity which are found in the groundwater are of lesser concern as salinity will subside over time

- Several researches show that through modeling of groundwater flow that the depletion of groundwater in the host community will persist up until 2022 and the replenishment of water will take place.

Considering the general climate change effects in Cox's Bazar area and offsetting the aggravating environmental situation due to the mass arrival of Rohingya communities, several specific measures including tree planation in sub-project areas, rainwater harvesting from every disaster shelter, construction of drainage facilities along the road length and installing thunder arrester across the areas, have been suggested and will be implemented.

3.3.2 Site Specific Screening and outcome

Climate Change impact on a particular subproject is tough to deduce as the highest resolution of climate model simulation done over Bangladesh is 50km. Depending on the simulation ensemble of Cox's Bazar district, the temperature and precipitation are likely to increase with time.

Site specific climate change impacts are often not so easy to measure or deduce plausibly while the site is confined to a narrow strip of roadways, and associated mitigation or offsetting measures are really hard to plot on the impact areas, though an overall set of measures are often considered in practical aspect. Fig:1 shows the inundation risk map of the subprojects under W-23, none of the subprojects are in vicinity of the severe river flood inundation area. So the risk of flooding is low around the sub-project area

[4] "Implications of Climate Change for Fresh Groundwater Resources in Coastal Aquifers in Bangladesh", World Bank report.2010

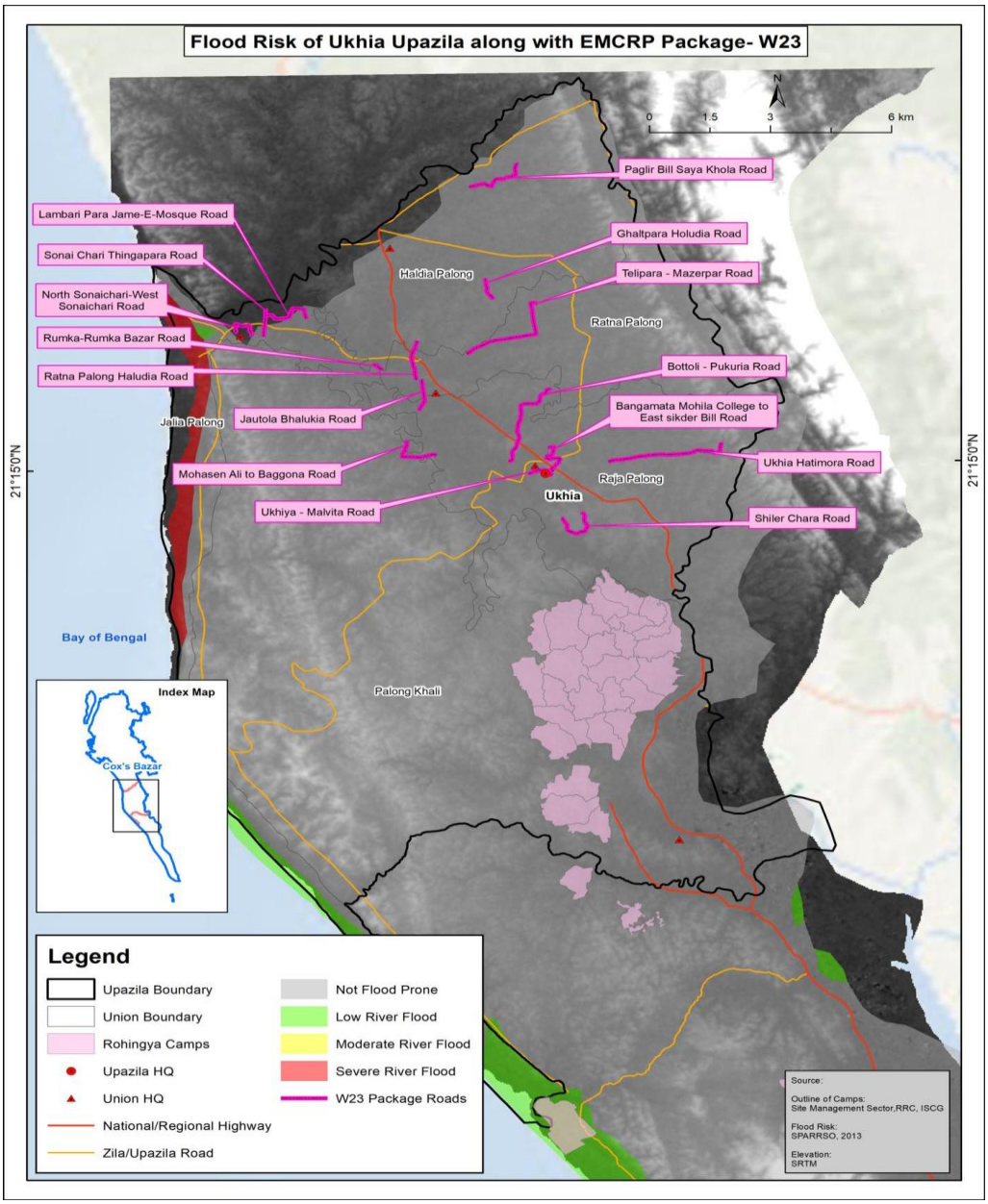


Figure 3.3.2.1: Flood inundation risk map near the subprojects.

Also, in order to avoid the devastation caused by the thunderstorm, state-of the-art thunder arrester (lightning protection system) has been suggested to install having a coverage area of 25,434 sq.m for a single arrester. In addition, tree planation on the road slope/ within the premises is also suggested to sooth the temperature effect and increase the water retaining capacity of soil, at the same time.

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

4.1 General

Considering the environmental settings of the sub-project area, it can be assumed that possible impacts would be largely construction-related, and could be addressed through adoption of good engineering practices; good housekeeping; better *in-situ* construction materials management; and observance of health and safety protocols during the implementation period.

Table 4.1.1: Site Specific Impact and Mitigation Plan under package W23.2

Component's name under W-23.2	Impacts	Mitigation plan
Jautola Bhalukia road Id:422945004	Reju khal (15m) to the south and Madborpara jame mosque (15m), Shadrikata jame mosque (10m) to the west. Further, some settlements located adjacent to the sub-project area might get affected during the construction period with the generated debris and dust, though for the time being.	Contractor must adhere to the best practice debris management procedure and regular adoption of dust control measures (spraying of water at least twice a day) to minimize the effect to the level best.
	Proposed subproject area arises water logging problem during the monsoon sometimes. On the other hand, some part of the proposed road is passing by the agricultural land. Cross drain and Box culvert will be constructed to terminate rainwater for one side to another side during rainy season and also help for rapidly remove excess soil water to reduce or eliminate water logging during monsoon and return soils to their natural field capacity and will help to maintain the water balance of both roadside agricultural lands to provide a sustainable irrigated agricultural system. It will also help to prevent flood and not to allow water to overflow and also help to divert water for farming. There are points on the road where slope preparation cannot be done due to having low lying agriculture lands and water bodies. Slope preparation refers to resettlement issues as well in those locations. In such cases Toe Wall is proposed which helps to restrain the horizontal surface pressure.	Proposed safety structures are **07 nos. Cross Drain** (dimension: 0.975mX 0.975m) at different chainage and **01 no. Box Culvert** (dimension: 2 vents: 4.50mX4.50m) at Ch. 800.0m of chainage, **44.0m Toe wall** at different Chainage, **Earth** works, **Road safety** works and **Environmental Mitigation and Enhancement** works.

Further construction related activities which may result in adverse impacts in the surrounding environment of the sub project must be kept under close consideration and appropriate mitigation and management measures will be taken with due care and vigilance. Once the effects are minimized to its least level and controlled efficiently, it will turn into a welcoming and beneficial project for the local communities. The subproject specific environmental management plans have been outlined in **Appendix-2**. The mitigation measures as well as monitoring program of ESMP have also been incorporated in the management plan.

Environmental quality enhancement: Under the additional financing to the EMCRP project, Forest Department of the Government of Bangladesh will afforest along 200 km of road length area, primarily under the Ukhiya and Teknaf Upazila of Cox's Bazar district in order to offset the environmental and ecological devastation, that had been occurred due to the evolution of Rohingya Crisis, to an achievable level. Many of these road lengths will go through and by the Rohingya Camps, up on the hill and are already denuded of trees or vegetation. Local Government Engineering Department (LGED) will allocate

and channelize the finance to the Forest Department under the said additional financing component and oversee the progress of works with due diligence. However, this enhancement work will improve the environmental quality of the area and reinstate some parts of the ecosystem services to those areas, though primarily.

4.2 Health and Safety Measure under COVID Situation

Apart from the established Occupational Health and Safety (OHS) measures being followed in construction sites, offices, and labor camps, a set of additional measures has to be taken and practiced throughout the daily cycle by each labor, staff and any involved parties, due to the ongoing pandemic coronavirus situation. Staffs and consultants at PIU and D&S, along with the pool of consultants under different firms/agencies for different services, and all the representatives or staffs of construction contractors and suppliers have to play much sensitive, (pro-) active and responsible roles in abiding by the rules and measures by themselves and getting the involved workers and different stakeholders adhered to the same. A detailed guideline containing a set of measures with shared responsibilities has been sketched out in order to fight the exposure and further spread of this potentially fatal situation. This plan or guideline shall constitute an integral part of ESMP measures for every sub-project, though is not included in this report to keep it concise and specific, and the contractor is required to keep the copy of that guideline at every site office.

However, among many other relevant issues, the guidelines emphasize on following line of directives:

a. Contractor must designate one of his employees as H&S/Safeguards supervisor to lead, coordinate and interface in order to fight the COVID 19 situation under the direct guidance of COVID focal at PIU of EMCRP project.
b. All workers, supervising and supporting engineers and staffs, consultants, service providers and other concerned parties must adhere to the personal health and hygiene rules, social distancing, and other protective measures in full in order to protect themselves and contain the infections any further. Necessary training and awareness campaign will be aligned with the specific sub-project scenario and prevailing conditions.
c. General practice of cleaning and hygiene has to be maintained in all project/site offices and camp sites, and supply of necessary PPEs and cleaning /disinfecting materials along with proper use of those is to be ensured.
d. Public consultation and stakeholder engagement are to be carried out considering the prevailing risks of virus transmission in the target areas, scope of interventions and level of ICT penetrations among the target stakeholders, and so on.
e. Necessary protocols have to be established and maintained in case of handling a sick employee or worker, and appropriate compensation to a sick disengaged labor is required to be given with due documentation.
f. Budgeting for suggested protective measures, along with necessary supervision and monitoring for the required interventions has to be ensured.

Following the additional health and safety measures presented in that guideline, sub-project component specific BOQ items have been inserted to supplement the budget considering the country-specific situation, capacities, and scope of interventions. The additional cost to Health and Safety Measures under COVID 19 situation is shown in **Appendix-3.**

4.3 Cost of Environmental Enhancement Works in BOQ

In consideration to the above-mentioned environmental impacts and their mitigation measures for this sub-project component, a set of items are included in the BOQ of this sub-project component. Social Safeguard Personnel for Environmental and Social Management for Work Package

EMCRP/W23 has also been added in the whole BOQ in order to take supervision and leadership to organize Environmental Management under Environmental Enhancement Works. The total costing and estimation have included enhancements such as Grass turfing plans, Tree plantation initiatives, Dust Suppression mechanisms. On the other hand, in order to ensure health safety and sanitary measures of workers PPE, First Aid Box, Labor shed, Environmental management, drinking water facility with water tests, Temporary latrine for both male and female as well as waste disposal systems has been accounted for. Ensuring sustainable labor performance in regards to environmental and social considerations motivational training has been taken into account. An overview of the estimation is given below and the detailed estimated cost to implement the ESMP is shown in **Appendix-3**.

5. LIMITATION OF THIS STUDY

Bangladesh government has imposed a nationwide lockdown to curb the spread of the novel coronavirus in the wake of series of deaths and infections. Authorities declared a ban on passenger travel on all sector from March 24 while all public transport on roads have been suspended from March 26 to stem the spread of virus, officially known as COVID-19. All office works have been postponed and an intended visit to the sites for further consultation with the relevant stakeholders has had to cancel due to this crisis. Therefore, some relevant information and arrangement needs awaiting for recovering this pandemic crisis.

6. CONCLUSION AND RECOMMENDATIONS

The overall conclusion is that if the mitigation, compensation and enhancement measures are implemented in full, there will be no significant negative environmental impacts in regards to the selection of location, design, construction, and/or operation procedure of the proposed Sub-project. There will in fact be tremendous benefits from recommended mitigation and enhancement measures and major improvements in quality of life, opportunities in business, trading jobs and ensuring social safety and security will be achieved once the scheme is in operation.

The conclusions of the Screening study can be summarized as follows:

- The communities will receive large benefits through improved infrastructural facilities, transportation & communication etc.
- The short-term negative impacts that may come by the way of air quality, noise, solid waste, occupational health & safety need to be minimized through the management plan.
- The project will create employment for those who live in the vicinity of the construction site and will provide them a short-term economic gain.
- The green belt development, if necessary, for the road site, with large-growing trees at the periphery of the site will give the places a more natural and pleasing appearance.
- A comprehensive Environmental and Social Management Plan (ESMP) has been prepared to mitigate and reduce the adverse impacts that will come out from the Subproject activities.

Implementation of this Sub-project will have large positive impacts to the communities in terms of improved infrastructural transportation & communication facilities, which would eventually develop the socio-economic condition of the catchment areas. So, strong recommendation should be put in place to implement the sub-project within shortest possible period of time, and with great care and efficiency.

Annexure-01: Important Environmental Features (IEFs) near site:

Detail Environmental features within 100m of the both sides from the center line were collected @300m longitudinal intervals. The findings of the survey for the aforementioned road can be seen in the table below:

Table: Detailed Chainage length and features of the Sub-Project component

Road Name	Jautola Bhalukia road Id:422945004 **(W23-2)**		**Total Chainage**	810.0m
Chainage (m)	**Left**	**Right**	**Features**	
000-300	L		Electric pole, paddy land, household connecting road, bridge on Chengchori chorra, bamboo bushes, paddy land, connecting road	
		R	Jhau tree, open space, mosque, Wash block, paddy land, tin shed household, open space, paddy land, household connecting road, pond, building under construction, culvert, paddy land	
300-600	L		Paddy land, household connecting road, electric pole, bridge on Jambunia chorra, brick boundary wall, paddy land, electric pole, shops, connecting road, big tree, bakery factory, brick boundary wall	
		R	Paddy land, brick boundary wall, building, building under construction, brick boundary wall, household connecting road, Jambunia Chorra, paddy land, mosque, shop, connecting road, big tree, electric pole, tin shed fencing, tin shed household, bamboo fencing, paddy land	
600-810	L		Brick boundary wall, household connecting roads, paddy land, electric pole, paddy land, open space	
		R	Paddy land, culvert, tin shed fencing, brick boundary wall, building, paddy land, household connecting road, tin shed fencing, tin shed household, bamboo fencing	

Annexure-02: Attendance of consultation meeting

EMCRP/W23.2

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)

স্থানীয় জিনিসে রোহিঙ্গা সংকট মোকাবেলায় মাল্টি সেক্টর প্রকল্প

Local Government Engineering Department (LGED)

Public Consultation Participants List

Focus Group Discussion

সময় : ১২:৪০ দুপুর তারিখ : 04.10.2020

উপ-প্রকল্প/কম্পোনেন্ট এর নাম : রাস্তাটিকা ডালুকিয়া রোড, ২৬(০২).

যে বিষয়ে হয় : ক্ষুদ্রাকারে কাজের দোকান,

ইউনিয়ন : কুতুপালং ওয়ার্ড নং : ০৮ মৌজা : কুতুপালং উপজেলা : উখিয়া জেলা : কক্সবাজার

সাব প্যাকেজ নং : EMCRP/W-23(2)

অংশগ্রহণকারীদের তালিকা (পরিচয় ও স্বাক্ষর)

ক্রম নং	নাম	বয়স	পুরুষ/নারী	গ্রাম	স্বাক্ষর / টিপসই
১।	ওসমানুল নাহার রিটিটি, এম, ইউ, নি ৭, ৮, ৯	৫২	নারী	মাদুকাটা	ওসমানুল নাহার
২।	মো: নুরুল হাকিম	৩৪	পুরুষ	মাদুকাটা	[illegible]
৩।	রেহেনা আক্তার	৩০	নারী	"	রেহেনা
৪।	মো: ফরহাদ	২৯	পুরুষ	মাদুকাটা	[illegible]
৫।	মো: সাইফুল ইসলাম	২৫	"	"	Saiful
৬।	আমির	৫৫	"	"	আমির
৭	কামাল উদ্দীন	৬০	"	"	কামাল
৮	মোঃ ইব্রাহিম	৪৮	"	"	ইব্রাহিম
৯	ইয়াছিন আরফাত	২০	"	"	ইয়াছিন
১০	সাহেদ	৬০	"	"	সাহেদ
১১	রুকিয়া	৪৫	নারী	"	রুকিয়া
১২	জেরিন	৩৮	"	"	জেরিন
১৩	দিলোয়ার	২৯	পুরুষ	"	দিলোয়ার

Figure: Attendance of consultation meeting for W23-2

Annexure-03: Pictures of sub-project component location and surrounding features with public consultation



Starting point of Jautola Bhalukia road


Agriculture Field on both side of the road


Existing bakery factory on the side of the road


Boundary wall & homestead garden on the side of the road


Agriculture field & Tin shed boundary on the side of the road


Consultation meeting with local community

Figures: Present condition of Jautola Bhalukia road (W23-2) & Public Consultation meeting with Host community

Appendix-1: Environmental Screening Form for examining sub-project component

Environmental Screening Form for Sub-project W23-2

Sub-Project Description Form:

Name of Sub-Project: (Improvement of 15 Roads with culverts and side drain under Cox's Bazar District. EMCRP/W23).

Name of the component: Jautola Bhalukia road Id: 422945004.

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Estimated total cost of sub-project (in Taka): 417,036,298.10 Tk.

Estimated construction period duration: 1 year

Estimated total cost of the component (in Taka): **14,593,897.51 Tk.**

Estimated Operation and Maintenance period (life of sub-project): Project design life more than 15 (Fifteen) years but Government policies on how long projects can operate in the camps.

District: Cox's Bazar **Sub-District**: Ukhiya **Union**: Ratnapalong

Name of Community/Local Area: Tekpara, Telipara, Shadrikata

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.): The Sub-Project is categorized as a village road and improvement with Bituminous Carpeting (BC) options. For drainage of rain water Construction of **07 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 141.0m, Ch. 155.0m, Ch. 262.0m, Ch. 294.0m, Ch. 355.0m, Ch. 477.0m & Ch. 642.0m of chainage and construction of **01 no. Box Culvert** (dimension: 2 vent: 4.50mX4.50m) at Ch. 800.0m of chainage, Due to the low land in different chainage for protection work of the road construction of **44.0m Toe wall** at different Chainage will be constructed as well as for **Earth** works, **Road safety** work and **Environmental Mitigation and Enhancement works** has been included in the estimation.

Estimated footprint / land area for this sub-project is 3,969 sqm.

Brief description of sub-project site: (e.g. present land use, Important Environmental Features (IEFs) near site, etc.:

This proposed Jautola Bhalukia road belongs to Tekpara, Telipara and Shadrikata villages at Ratnapalong union, Ward-7, 8 & 9 under Ukhiya Upazila. This road has started from Jhawtola road stretching 810 meters from North side to South side, along with ancillary connecting road, boundary fencing, shop, settlements, trees, mosques, household connecting road, agriculture fields, electric pole, chorra etc.

Overall Comments

The proposed component of the sub-project (Road improvement) is not located within any remarkable environmentally sensitive area and will not cause any severe affect to the environmental settings of the area, thus not going to create intimidation to important environmental features. No drainage congestion/water loggings have been observed in the road area. But, some local trees like betel nut tree, bushes etc., or additional vegetation may need to clear out due to construction

activities, with appropriate offsetting measures to be taken. No agricultural productive soil will be used for the purpose. Earth will be compacted for stabilization. The inputs will be mainly at construction phase and limited within project boundary. Moreover, mitigation measures will be taken according to the ESMP for minimizing the air, dust and noise pollution.

It has been revealed that this project's scopes of works do not intend to overtake their area of lodgment and funding entity has no intention to do so. Moreover other issue has also been brought to their attention that drainage system and a bridge have also been included into the evaluation of this project since runoff from higher grounds are also a concerning matter during rainy season.

People of the subproject area are very much optimistic about the success of the project and are also eager to participate in the project activities. The subproject is environmentally sustainable and socially acceptable. The local community attended in the participatory public consultation meeting. Their community representatives as teachers, shop owners, farmers and elders have no objection to the construction this infrastructure in the proposed site; the community also appreciated the initiative of LGED to ensure safe access and better portability. The public consultation meeting results confirmed that improvement of this road will increase socio-economic interest in the communities and make lives easier for these people. They also requested to construct the road in accessible width so that small auto and motor vehicles can pass easily. Water flow from undulated terrains is a factor that should be considered for construction because 1 week worth of rain invites water flow which makes this surrounding area logged in several places. On another matter, locals requested to involve the local community to construction works and material storage monitoring duties.

The road is not located within any identified environmentally sensitive area, and therefore, does not seem to cause any adverse impact on the important environmental features. No significant impact is expected on the ecosystem and biodiversity, no agricultural land/ activities or fish farming will be disturbed, due to the construction of the sub projects. Only forest is found as homestead forest on high grounds of the location.

Types of waste to be generated during construction and operation phase:

During construction period solid waste will be generated due to construction activities. The types of wastes are brick pit, unused sand, wood, gravels, bitumen etc. The types of wastes are gravel, stones, rock, wood, copper wires, concrete, iron, plastic etc. Negligible amount of plastic will come as residue. Moreover, liquid waste will include chemicals of bitumen leftovers, motor oils, used oil, Degreasing solvents etc. Human wastes and kitchen wastes will be generated from labor camps as well.

Sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site including elephant migration routes and remaining forests:

Within the influence area of the subproject no historical sites were identified. This sub-project is situated within Tekpara, Telipara and Shadrikata villages at Ratnapalong union, Ward-7, 8 & 9 of Ukhiya Upazila, Cox's Bazar. Some sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site are at north side Ratnapalong UP (800m), East Ratna Moitri Buddhist Temple (850m), at south side Reju khal (15m), Tuturbill GPS (700m), Tuturbill jame mosque & graveyard (300m), Tuturbill Central Jame Mosque & Graveyard (450m), at east side Baitun-nur-

Hakim Ali mosque (300m), Telipara mosque & graveyard (400m), Palong garden community center (200m), Hijolia khal (500m) and west side Madborpara jame mosque (15m), Shadrikata jame mosque (10m), Courtbazar (500m). Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists.

Some human settlements and agricultural land are found around the sub-project area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). Elephant migration routes were about 9-10 km away from this sub-project. No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below:

Section A: Sub-Project Overview

Description of sub-project/component interventions:

The Sub-Project is categorized as a village road. Based on field survey, this sub-project involves of Herring Bone Bond (HBB). According to the design this sub-project will be developed with Bituminous Carpeting (BC) from Ch. 00 to Ch. 810.0m.

Subproject interventions:

- **Bituminous Carpeting (BC)** options.
- **07 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 141.0m, Ch. 155.0m, Ch. 262.0m, Ch. 294.0m, Ch. 355.0m, Ch. 477.0m & Ch. 642.0m of chainage
- **01 no. Box Culvert** (dimension: 2 vent: 4.50mX4.50m) at Ch. 800.0m of chainage
- **44.0m Toe wall** at different Chainage,
- **Earth** works,
- **Road safety** works and
- **Environmental Mitigation and Enhancement** works (description of such items can be found in BOQ)

Sub-project Location:

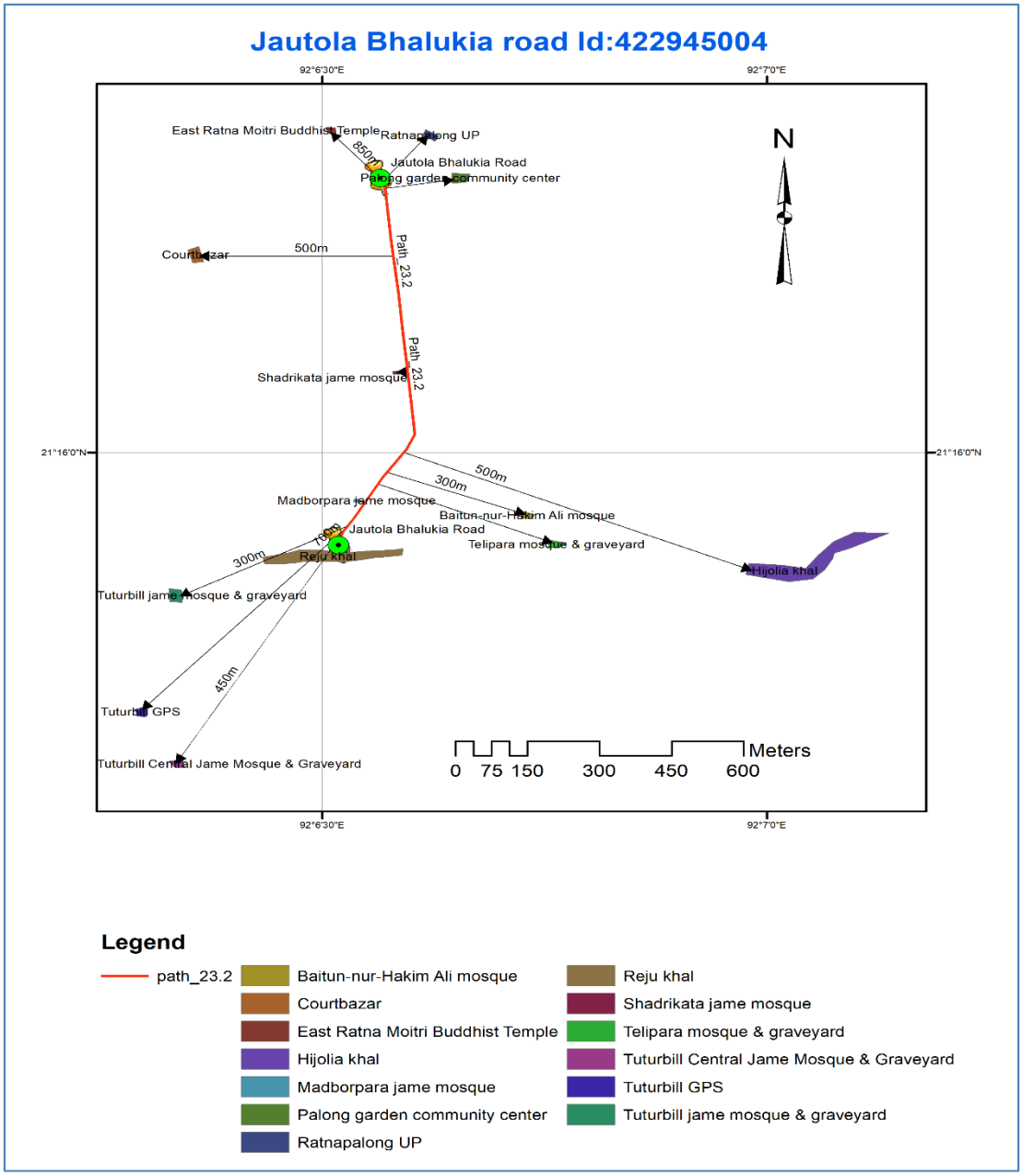
Important Features	
ID	422945004
District	Cox's Bazar
Upazila	Ukhiya
Union	Ratnapalong
WARD	7, 8 & 9
Total Chainage	810m
Proposed Chainage	810m
Road Type	Village Road
Proposed Intervention Type	Bituminous Carpeting (BC)
Road Starting Point Coordinates	Latitude: $21^0$16'21.6" N Longitude: $92^0$06'34.2" E
Road Ending Point Coordinates	Latitude: $21^0$15'52.7" N Longitude: $92^0$06'31.1" E

Land ownership Land is owned by Government.
Expected construction period: 1 year
Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water bodies, etc. and historical or socio-cultural assets): Please also explain any analysis on alternative location was conducted: Some existing interventions within the sub-project location at north side Ratnapalong UP (800m), East Ratna Moitri Buddhist Temple (850m), at south side Reju khal (15m), Tuturbill GPS (700m), Tuturbill jame mosque & graveyard (300m), Tuturbill Central Jame Mosque & Graveyard (450m), at east side Baitun-nur-Hakim Ali mosque (300m), Telipara mosque & graveyard (400m), Palong garden community center (200m), Hijolia khal (500m) and west side Madborpara jame mosque (15m), Shadrikata jame mosque (10m), Courtbazar (500m). Within the influence area of the subproject no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (checked with local IUCN representative).

Section B: Environmental Screening

***B.1*: Environmental feature of sub-project location**

Description of cultural properties (if applicable, including distance from site): **Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests:** Sensitive environmental, cultural, archaeological, religious sites within 1 kilometer of site including at north side Ratnapalong UP (800m), East Ratna Moitri Buddhist Temple (850m), at south side Reju khal (15m), Tuturbill GPS (700m), Tuturbill jame mosque & graveyard (300m), Tuturbill Central Jame Mosque & Graveyard (450m), at east side Baitun-nur-Hakim Ali mosque (300m), Telipara mosque & graveyard (400m), Palong garden community center (200m), Hijolia khal (500m) and west side Madborpara jame mosque (15m), Shadrikata jame mosque (10m), Courtbazar (500m). There are no other sensitive environmental, cultural, archaeological sites within the catchment area of this sub-project. **A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas are shown below.**



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive features found in the footprint area, except matured vegetation on the sides of the road which are homestead gardens and forest. Several mosques, madrasa and local settlement were found during the survey. It will not be affected by the construction works, as the activities will be carried out within the existing subproject boundary and necessary preventive and mitigation measures will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*

No. There is no existence of Elephant corridor/ route now, which have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) potential impacts on remaining forests in/around camps Yes/No

N/A (This activity will be confined within the existing subproject boundary)

(3) Other issues: N/A

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:

Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, tractor, trailer, etc. move on roads adjacent to sub-project throughout the day and night generate noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation):

Landslide potential is low. There is low possibility of soil erosion or landslide during construction period of targeted sub-project. The impacts are negative but very small scale, site-specific within a relatively small area and adjustable by mitigation measures.

Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH):

Groundwater is the main source of potable water in the Sub-project area. The shallow depth is about 60 feet to 70 feet and deep tube well depth is 700 to 800 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 400-800ft (Field survey, 2019). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer.

Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)

Status of wildlife movement:

N/A (None of the information was found about the wildlife movement in or across the area)

State of forestation:

Patches of vegetation containing large and matured trees across the road side and some social forest on hill of the proposed subproject area are located within 200m radial distance.

Summary of water balance analysis (For water supply scheme only):

N/A

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g. status of access road or any other facility required for sub-project to be viable): Existing BC roads named Telipara connecting road, Jhawtola connecting road and Muktijodha Somsher Alom Chowdhury connecting road are concerning ancillary facilities, the access road for the sub-project is proper in order for the equipment vehicles to arrive at the proposed location. Nonetheless, heavy four wheelers will not be a suitable option, this may cause more dust in the air also, the route has narrow curves.
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction: Toilet and water supply facilities will be ensured by the contractor in the vicinity of the construction area for all the components of the sub-project, electric connection will be established with the accommodation facility due for the workforce. Electricity is available in the area.
Possible location of labor camps: Labor camp can be established along the road since there are available open private lands for Faruk Ahmed's private land at Tekpara, Ula Mia and Female UP Member's private land at Shadrikata. However, this will have to be done with the consent of land owner under a mutual agreement, with the supervision of the Engineer in charge.
Requirement and type of raw materials (e.g. sand, stone, wood, etc.): i) Bricks ii) Sand iii) cement iv) Gravel v) water vi) Aggregates vi) steels vii) Bitumen are the most common type of road materials used in construction.
Identification of access road for transportation (Yes/No): Yes. Existing BC roads named Telipara connecting road, Jhawtola connecting road and Muktijodha Somsher Alom Chowdhury connecting road are available for the access road.
Location identification for raw material storage: Adjacent to labor camp or different location is available. However, this will need placement on open fields and should be consulted with local committee. Material storage area must be well fenced and materials will be covered with tarpaulins.
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.): Earth/ mud, plastics, brick chips, cement dusts, dust from bricks, steel wires, during construction which can be identified as solid wastes. Also, sludge will be produced from labor camp latrines and kitchen waste mostly composing of organic matters as fiber, starch, carbohydrates and proteins. 10% of the kitchen waste may be classified as plastics or non-biodegradables. Solid waste may amount to 20 kg daily and sludge may amount to 5 kg per day.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g. Solids wastes, liquid wastes, etc.): **Solid waste:** Residual waste from the labor camps will be generated. Equipment

maintenance/vehicles on-site and scrap material will occur during construction works which are mostly solid waste. Leftover oils or spills from machinery can be a high probability generating liquid waste. Waste from civil works. And the quantity will be tentatively 150 kg. **Liquid waste**: During construction period fecal sludge will be generated from the labor camp and the quantity would be nearly 6 kg per day, which would be reduced in weight in course of time. Leftover oils or spills from machinery can be a high probability generating liquid waste.
Type and quantity of raw materials used (wood, bricks, cement, water, etc.): **Type:** i) Bricks, ii) Sand iii) cement iv) aggregates v) water vi) concretes vii) Bitumen are the most common type of road materials used in construction. **Quantity**: It is difficult to give exact figures of construction waste produced on a typical construction site.
Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards: No such vegetation is present in the right of way. Specific soil amount is not needed for the project. The current condition explains that there is no aggregated soil on the right of way.
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) The possibility is Medium, for stagnant water bodies to occur. Because water usage will be higher during the construction period. By default, this area has no water logging troubles due to being natural channels. Moreover, no possibilities of stagnation of water in long run. So, local communities have stated that they do not have severe troubles with mosquitos or other disease vectors.
Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) Chengchori chorra, Jambunia Chorra and Reju Khal are the existing drainage channel around the sub-project location.
Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. Because under this intervention, there is very little scope of damage to terrestrial or aquatic ecosystems or endangered species.
Activities that can lead to landslides, slumps, slips and other mass movements in road cuts: Scope of work leading to low scale effects of landslide. The impacts are negative but short-term and site-specific. It can be managed through mitigation measures.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description) Low, since both sides of the road is more or less similar elevation. The concentrated outflow will be managed since the sub-project has included drains.
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: No
Chance of long-term or semi-permanent destruction of soils:(High/Medium/Low with description) No
Possibility of odor and water, soil quality impacts from SWM and FSM disposal system:(High/Medium/Low with description) No
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) There is no possibility of stagnant water bodies remained for encouraging mosquito breeding and other disease vectors, during the operation phase.
Likely direct and indirect impacts on economic development in the project areas by the sub-project: Construction or implementation of a road project substantially contributes to the development of the project areas. It surely improves the communication network, reduces the transport time, increases the trade and business in/around the areas, and ensures access to better living conditions with amenities, better educational and job opportunities and health facilities. Thus, the direct and indirect impacts on economic development in the project areas would be enormous by this sub-project.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No existing drainage channels or surface water bodies found in the project area, therefore, no such effect can be anticipated.
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. There are no protected areas in or around project sites, and no known areas of ecological interest.
Activities leading to landslides, slumps, slips and other mass movements in road cuts: The entire sub-project component area is nearly flat; thus, no such type of impacts is anticipated.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) No
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: Improved road communication will definitely increase the traffic/ vehicular movement, which must increase the light and noise pollution, but air pollution effect will not be increased significantly, as the proposed BC road will reduce the pollution generated from dust on the muddy road, especially during the dry season and if the vehicles are maintained in good conditions.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

Section D: Environmental Screening Summary of the Work Package-23.2

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
1: Sub-Project Interventions	**Air quality**	Under the subproject intervention the overall score is **low**.	• Limiting earthworks; • Watering of dry exposed surfaces and stockpiles of aggregates at least twice daily, as necessary; • Requiring trucks delivering aggregates or bricks and cement to have tarpaulin cover and Limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Covering of trucks; • Records of air quality inspection	Visual monitoring of air quality and if requires, air quality test (CO, $PM_{2.5,10}$) once in construction period in winter season.
	Soil impacts	Under the sub-project intervention the overall score is **low.**	• Precautions might be taken when rainstorms are likely, when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms. • The earthwork sites where exposed land surface is vulnerable to runoff shall be consolidated and/or covered. • The material stockpile sites shall be far away from surface water bodies and areas prone to surface run-off. Loose materials shall be bagged and covered. • Channels, earth bunds, netting, tarpaulin and or sand bag barriers shall be used on site to manage surface water runoff and minimize	Construction Contractor monitored by Consultant and PIU	• No visible degradation to nearby drainages, • *khals* or water bodies due to soil erosion. • Rain storms in construction phase.	Monitoring as weekly basis.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
			erosion. • The overall slope of the work areas and construction yards shall be kept to a minimum to reduce the erosive potential of surface water flows elsewhere.			
	Hydrology (surface and groundwater)	Under the subproject intervention the overall score is **low**.	• All precautions to store chemicals/oil/fuel properly so that no chance of spill. • Workers must specify waste dump locations to avoid littering which in turn might negatively affect surface and ground water. • Monitor water quality according to the environmental management plan.	Construction Contractor and monitored by Consultant and PIU	• Areas for stockpiles, storage of fuels and lubricants and waste materials; • Records of water quality inspection; Water Quality Test • (National Drinking Water Quality Standard Parameters)if requires; • No visible degradation to nearby drainages, *khals* or water bodies due to construction activities. • Records should	Water quality test (mainly GW) twice during the construction period in six months interval.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
					be kept and logged.	
2: Pre-construction Phase	**Sanitation, water supply**	Under the subproject intervention the overall score is **low**.	• Provide suitable housing, adequate supplies of potable water, and toilet and bathing facilities within labor camp area for the assigned laborer. • Provide means for disposing of wastewater from toilets, baths and food preparation areas either through a septic tank and soak away, or holding tank with removal by vacuum truck. • Records for any type of training or awareness building sessions must be kept at site.	Construction Contractor and monitored by Consultant and PIU	• Site-specific H&S Plan; • Records of supply of uncontaminated water; • Record of Health &Safety orientation trainings; • Condition of sanitation facilities for workers	Visual inspection by PIU and supervision consultants on monthly basis
	Transportation	Under the subproject intervention the overall score is **low.**	• Contractor should verify vehicles for the suitability of carrying, loading and unloading of materials	Construction Contractor and monitored by Consultant and PIU	• Record of regular inspection. • Record of accidents/incidents	Monthly monitoring.
	Storage of construction materials	Under the subproject intervention the overall score is **low**.	• Orienting concerned person and team assigned for the construction work.	Construction Contractor and monitored by Consultant and PIU	• List of materials and sources of materials;	During implementation phase, as necessary with discussion with PIU, Consultant

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
3: Construction Phase	**Wastes**	Under the sub-project intervention the overall score is **low.**	• Prepare and implement on-site waste water runoff and labor camp waste management plan approved by PIU and consultants. • Wastes must be placed in the designated bins which must be regularly emptied. These shall remain within demarcated areas and shall be designed to prevent wastes from being blown out by wind. • All waste must be removed from the site and transported to a disposal site.	Construction Contractor and monitored by Consultant and PIU	• Complaints from community; • Regular inspection of waste management activity; • Waste disposal record.	As work weekly progresses
	Cut and fill Activities (Cutting of hill slope and earth removal from borrow areas caused for soil erosion and landslides)	Under the sub-project intervention, the overall score is low.	• During construction cut and fill will be balanced as far as is possible. Designs shall ensure that as far as possible all cut and fill activities are balanced • Proper care will be taken during cutting and filling so that slope or toe of the road embankment remain within the right of way and does not disturb the crop.	Contractor, environmental specialist of D&SC	• Location of road alignment and slope.	Daily as work progresses
	Storage of materials	Protected and safety storage to be needed for	• With the assistance from site management committee in Camp to identify the storage site and other requirements, which will be	Construction Contractor and monitored by Consultant and PIU	• List of materials and sources of materials; • Storage areas for	Monthly basis during implementation phase, as necessary

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
		construction materials storage. Not interrupt natural land contours, disturbance in natural drainage patterns and logging of water and the overall score is **low.**	approved by PIU and consultants.		materials and equipment.	with discussion with PIU, Consultant
	Removal of Vegetation (May cause soil erosion and their deposition on nearby crop field, affecting soil quality and productivity)	Under the sub-project intervention, the overall score is **low.**	• If during detailed design cutting of trees is required, compensatory plantation for trees lost at a rate of 5 trees for every tree cut. • Prevent workers or any other person from removing and damaging any flora (plant/vegetation) and fauna.	Contractor, environmental specialist of D&SC	• Complaints from community;	Daily
	Noise pollution	Under the subproject intervention the overall score is **low.**	• Consultation with affected people; not to operate noisy equipment during working period; • No noisy work after 5.00 pm. • Sound suppression for equipment; • Ear protection for workers.	Construction Contractor and monitored by Consultant and PIU	• Number of complaints from stakeholders; • Use of silencers in noise-producing equipment and	Inspection by PIU and supervision consultants on monthly basis;

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
			• Conduct noise quality monitoring as per EMP.		sound barriers; • Noise Level following decibel meter (dB)	
	Air pollution	Under the subproject intervention the overall score is **low.**	• Water spraying for dust control; construction materials with potential for significant dust generation shall be covered; no smoke emitting equipment; and limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor and monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Records of air quality inspection.	Visual observation and monitoring of air quality during construction period.
	Road Safety and Accidents	Under the subproject intervention the overall score is **low.**	• Erection of suitable signage at construction sites • Direct observation and discussion with local people • Restrict the transport of oversize loads. • Operate construction vehicles to non-peak periods (night) to minimize the traffic disruption. • Enforce on-site and access road speed limits. • The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc.	Construction Contractor, environmental specialist of D&Sc.	• Complaints from communities, pedestrians	Day basis during work time

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
			• Local residents should be kept informed about planned Works .			
4. Post Construction	**Road Safety**	Under the issue the overall score is **low**.	• Install traffic signs for speed limit, speed breaker where needed, Mile post and create adequate ***traffic*** detours, and sufficient ***signage*** & ***warning*** signs, Post speed limits and suitable bending on the road. • The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc.	Construction Contractor, environmental specialist of D&Sc	• Road signage and safety instruments at suitable locations and chainage	Immediately after the construction work is over.
	Tree re plantation	Under the issue the overall score is **low**.	• Replantation of trees during monsoon period • Maintain of trees properly • Check survival of trees and replant the dead trees	Construction Contractor, environmental specialist of D&Sc	• Number of complaints from stakeholders; • Records of trees number and tree plantation inspection.	Immediately after the construction work is over.
5. Operational Phase	**Maintenance of road and assets** (Road accidents may increase due to higher number of	Under the issue the overall score is **low**.	• No advertisement/boardings shall be allowed within the Right of Way limits of the project road. • Regular maintenance and cleaning of assets such as sign boards, road safety sign etc. shall be undertaken.	LGED	• Number of complaints from stakeholders;	During Operation under LGED's regular maintenance program in each 3 years.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
	vehicles using the roads at increased speeds)		• Clear smooth speed breaker/rough surfaces should be clear in views. • Regular maintenance of road surface and shoulders.			

* Overall Impact Score: High = Likely to cause long-term E&S impacts; Medium = Likely to cause temporary impacts; Low = Likely to cause little, short-term impacts

**Post-construction phase denotes the time period contractor use to clear and clean up the sites after the construction work is ended, perform tree plantation, grass turfing, and minor rectification till the official handing over the site to LGED, or owner of the site.

Recommendation for further environmental and social assessment and/or site specific environmental and social management plan: Yes

**If yes, please specify what assessments/plans would be required.* Mention some recommendation on E&S assessment …. ESMP

If site specific environmental and social management plan (ESMP) is followed the impacts can be mitigated and monitored. ESMP is attached.

Appendix-2: Environmental and Social Management Plan (ESMP)

ESMP for Access and evacuation Roads; *(LGED/EMCRP-W23.2): Jautola Bhalukia road Id:422945004*

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
Pre-Construction Stage	Loss of land / and other physical assets	• No land acquisition is allowed within this sub-project activities So, there are no any mitigation measures according to this impact.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of livelihood	• Under this subproject, there is no scope of negative impact of adjacent livelihoods	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Stakeholders Engagement	• All of the project stakeholders should be consulted • Separate community level consultation meeting with the potential affected HHs • Consultation meeting with host communities about the project objectives and scope of works	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of right to access	• Project to ensure thorough analysis of alternatives that access enjoyed by the community remains intact. • In case of unavoidable circumstances, alternative access will be provided.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Site Selection & implementing interventions: Human-elephant conflict	• Selection of sub-project sites and all implementing interventions must take place outside of the elephant corridor/influence area.	PIU	Environmental Consultant of PIU, PSC
Pre-Construction Stage	Site Preparation: Soil Erosion; Alteration of natural drainage	• Our selected sites avoided the low land near the water bodies or natural flow path to avoid the flash flood or any kind or surface runoff.	PIU & Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Tubewell location within the construction site is not near to any kinds of latrine and soaks well which could be contaminated by those. • After completing the development we restored the place as like before to avoid the cut and fill operational problems. • This site is in the local community, so we discussed with the local community to avoid any conflicts related local habitation, culture. • Sub project intervention mustavoid of natural disturbance of existing slop and natural drainage. • The contractor ensuring sound environment for the local residents near the sub project site.		
Construction Activity	Noise from construction works	• Construction activities mostly will finish at day time within 05 PM, and must confirm proper measures for avoiding any disturbance. • All Personal Protective Equipments (PPEs) must be ensured in sites before starting any kinds of construction works.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Dust	• Acceptable range of emission of CO, particulate matter [SPM (**Suspended particulate matter)**, PM2.5, 10] and Hydrocarbons must be maintained through good construction work practices • Dust generation must be limited as a result of clearing, leveling and site grading operations with using water florescent manually and through water pipes.	Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Dust generation due to vehicle movement on connecting road shall be controlled by watering the path at limited level		
Construction Activity	Safety Issues	• Unauthorized entry is completely prohibited in our site and take necessary measures for preventing this problem • Before works started Contractor must provide proper training and guidelines on health and safety issues to the labors and associated staffs. • Records of every training must be kept at site. • All kinds of Child labour are completely prohibited in every site. • Every construction materials storage site will be well fenced by Tin and safety caution tape.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Traffic Management	• Contractors will maintain proper route for traffic management which is to beconsulted with and confirmed by the Executive Engineer of Cox's Bazar.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Conflicts with existing users due to the scarcity of resource base.	• A detailed assessment of the available resources and consent of the local representative for withdrawal of water from existing surface water sources shall be taken. • If ground water is withdrawn, adequate approvals from the appropriate department need to be undertaken before setting up bore wells. • Any type of consent letter or agreement for withdrawing water from either surface or underground	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		sources will be kept on site. • Local community must be consulted before any construction works starts.		
Construction Activity	Increase in road accidents	• Maintain safety measures during the movement of heavy machinery and equipment. • Local community will be trained up on traffic management and awareness.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Labour Base Camp: Conflicts with the local residents	• Awareness building session will be undertaken about prevention of child abuse, child marriage, GBV, sexual harassment, trafficking of women and children as well as illegal drug trade. Written records of this awareness building session shall be kept on site. • Work force should be prohibited from disturbing the flora, fauna including hunting of animals, wildlife hunting, poaching and tree felling. • Adequate facilities ensuring sanitation for labour camps will be put in place • Treated water will be made available at site for drinking purpose. • Adequate accommodation arrangements for labour forces. • Labor code of conduct is to be disclosed through consultation.	Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Construction Activity	Waste Management: Improper management and handling of hazardous and non-hazardous	Preparation of a waste management plan covering the following aspects: • Residual waste from the temporary accommodation	Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
	waste during construction.	facilities for labor Waste and from equipment maintenance/vehicles on-site • After completion of construction works. So, recycling process is not applicable. • Proper consents for hazardous waste management.		
Construction Activity	Health & Safety Risks: • The potential for exposure to safety events such as tripping, working at height activities, fire from hot works, smoking, failure in electrical installation, mobile plant and vehicles, and electrical shocks. • Exposure to health events during construction activities such as manual handling and musculoskeletal disorders, hand-arm vibration, temporary or permanent hearing loss, heat stress, and dermatitis.	• All construction equipment will be properly inspected timely. • The risk assessment will be prepared and communicated prior to the commencement of work for all types of work activities on site. • Preparation of proper walkways and clearly designation as a walkway has to be ensured; all walkways shall be provided with good conditions underfoot; signposted and with adequate lighting. • Proper Signpost at any slippery areas will be ensured in construction site. • Fire extinguishers will be located at identified fire points around the site. The extinguishers must be appropriate to the nature of the potential fire. • This sub project has Proper communicative emergency response plan (ERP) with all parties, the ERP to consider such things as specific foreseeable emergency situations, organizational roles and authorities' responsibilities and expertise, emergency response and evacuation procedure and personnel will be trained and drilled to test and ensure the coherence with the plan.	PIU & Contractor	Environmental Consultant as well as Social Development and Gender Specialists of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• All people of construction site will be concerned about the safety and maintenance of Electrical equipment; works will be carried out on live systems. • Provision to first aid box in sub-project areas will be ensured. • Proper Emergency evacuation response plan will exist in sub-project area. • All safety equipment will be available in sub-project site (safety, size, power, efficiency, ergonomics, cost, user acceptability etc.), the lowest vibration tools will be provided that are suitable and can do the works. • Awareness training will be given to all personnel involved during the construction phase in order to highlight the heat related illnesses of working in hot conditions such as heat cramps, heat exhaustion, heat stroke, and dehydration. Written records of this awareness training shall be kept on site. • Adequate quantities of drinking water will be available at all Sites, on different locations within the site. • Provision to maintain proper PPE wherever necessary and to ensure that there are satisfactory washing and changing facilities. • Provision to ensure all workers exposed to a risk are aware of the possible dangers and also given thorough training on how to protect themselves and there should be effective supervision to ensure that the correct		

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		methods are being used.		
Construction activity	Odours and pollution caused by leaking latrines and faecal sludge, and solid wastes impacting surrounding water bodies, flora and fauna	• Preventative maintenance schedule should be followed. • Solid organic wastes should be stored in bins and/ or skips and emptied regularly at a designated waste disposal area away from the camp site. If no designated site is available within the reach, a dug-hole at a nearby place can be used with periodic filling with soil layer for preventing pollution and generating nutrient rich compost soil over time.	PIU	Environmental Consultant of PIU, PSC. Union Member
Decommissioning during the project implementation period (including site clearance after the construction)	The impacts are similar to those listed in construction stage: • Pollution from waste materials • Health & Safety risks to workers and local community	• Contractor must prepare a demolition and waste management plan including following directive aspects given hereunder.	PIU / Contractor	Environmental Consultant of PIU, and Executive Engineer of Cox's Bazar
Operation &Maintenance	Noise disturbances to fauna	• Provision to maintain noise and vibration from the operation and maintenance of machinery and equipment by proper monitoring and measures. • Provision to take necessary lighting, caution for the works and necessary maintenance should be done in day light.	UE-LGED (Under the guidance of Executive Engineer, Cox's Bazar)	PSC. UNO

Waste Management Plan:

The Contractor shall develop a waste management plan for various specific waste streams (e.g., reusable waste, flammable waste, construction debris, food and organic waste etc.) prior to commencing of construction and submit to LGED for approval. The plans must include following principles or series of actions, which will be carried out/followed by the contractor and supervised by the Field level Environmental Specialist and Social Development Specialist.

For wastes:

- The quantity of waste materials shall be minimized by 3R (Reduce, Recycle and Reuse) approach, and wastes shall be segregated accordingly, wherever practical; and stored in designated places/facilities in the site.
- Construction site shall be maintained in a cleaner, tidy and safe condition and appropriate facilities shall be provided and maintained as temporary storage of all wastes before transportation and final disposal.
- Hazardous waste viz. waste oil etc. will be collected and stored in a paved and bounded area and subsequently sold to authorized recyclers.
- The scrap material generated from related construction activities will be collected and stored separately in the stack yard and sold to local recyclers.
- All wastes generated during construction shall be disposed off in an environmentally acceptable manner. This will include consideration of the nature and location of disposal site, so as to cause less environmental impact.
- Other leftover non-hazardous wastes, including construction debris shall be transported to an approved disposal site by pick up tracks or back loaded vehicles with proper care.
- Organic wastes produced in the camp site during the construction period shall be collected and transported in vehicles covered with tarps or nets to prevent spilling waste along the route to the designated disposal site;
- Burning of any type of wastes in the construction site shall be prohibited completely.

Prepared by: Harogopal Kabiraj, Environmental Focal Person, +8801714980171

Tanvir Ahsan Haque, Environmental Specialist, +8801688117059

Ms. Sadia Azad, Disaster and Climate Change Specialist, PIU.

Reviewed by: Md. Saiful Islam, Field Level Environmental Specialist, +8801913442006

Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.2

In consideration to the above-mentioned environmental impacts and their mitigation measures for all sub-projects, individual BOQ for each component has been prepared. Following tables will illustrate such items of enhancement and impact mitigation works as well as considering the emerged situation of COVID-19, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites.

Sl no.	Description of item	Quantity	Unit price	Total amount
1.	**Grass Turfing** Turfing on embankment top and slope & any critical place with good quality turf supplied by the contractor of not less than 225mm square in dimension including placing and watering till grass is fully grown, etc. all complete as per direction of E.I.C. (Payment to be made only when grass is fully grown)	2403.7 Sq.m	@38.15 Tk. Per sqm	91,701.16
2.	**Dust suppression measures** Dust suppression measures like water sprinkling on aggregates/unpaved roads, in and around the work site and as per direction of E-I-C	810.0m	@ 2.56 BDT	2,073.60
3.	**Water Supply and Sanitation** Providing and maintaining adequate portable water supply, sanitation, cleanliness facilities at camp site and work site to the entire satisfaction of Engineer-in-charge. **Temporary Toilet:** Construction of temporary toilets in work site/ rest area complete as per design and specifications and approved by the Engineer-in-Charge. There should be 1 camp in each site. In each camp, there should be 1 no of toilet for women and 1 no of toilet for men.	2 nos.	@12822.86 per toilet	25,645.72

Sl no.	Description of item	Quantity	Unit price	Total amount
4.	**First Aid Box** Supplying, equipping and maintaining adequate first-aid box throughout the working period at worksite and site office, and erect conspicuous notice boards directing where these are situated and providing all requisite emergency medical first aid kits, including complying with the government medical or labour requirements at all times, and provide, equip and maintain necessary dressing kits throughout the working period for attending minor injuries, etc. all complete as per requirement and full satisfaction of Engineer-in-charge.	1 no.	LS @5000 Tk. Per box	5,000
5.	**Drinking Water Facilities** Providing continuous adequate drinking water supply at worksite and site office as well by installing necessary tube-well/s where applicable or any other means depending on local situation, also providing essential arrangement for storing drinking water by supplying portable best quality water tank equivalent to Gazi/Padma of adequate capacity depending on the number of users, including supplying 1 (one) no. best quality water filter of minimum capacity 30 liters with necessary kits, etc. all complete as per satisfaction and direction of the Engineer-in-charge.	2 nos.	LS @ Tk. 30,000	60,000
6.	**Traffic Management** Maintaining traffic management at worksite from time of commencement of contractor's activities to time of completion activities, including ensuring that the road is safe for users, providing a safe working area for those involved in work on trafficked network and minimizing any disruption to smooth flow of traffic (this includes providing necessary barricades, warning signs/lights, guide signs, flagmen, maintaining diversion roads by cutting, filling, constructing, etc. or by any other means) in accordance with the full	1 no.	LS @ Tk. 15,000	15,000

Sl no.	Description of item	Quantity	Unit price	Total amount
	satisfaction of the Engineering-in-charge.			
7.	**Personal Protection Equipment for Workers** Providing and maintaining appropriate (safe design, fit and comfort) personal protection equipment (PPE) to ensure the highest possible protection for employees in establishing and maintaining a safe and healthful working environment at workplace, including demonstrating, providing training on proper understanding and development of skill in the use of PPE, including supplying (i) best quality safety jacket, (ii) suitable hand protection gloves, (iii) appropriate foot protection shoes, (iv) best quality safety helmets, face shields, ear muffs etc. (v) suitable eye protection goggles	LS	LS @ Tk 30,000	30,000
8.	**Tree plantation** Tree plantation to compensate the felled down trees and enhance the ecological condition in the subproject area- preferably local fruits, flowers, medicinal and ornamental trees- Mango, Jackfruit, Jam, Kathbadam, Chalta, Krisnachura, Bokul, Jarul, Polash, Kadom, Shimul, Neem, Arjun, Amloki, Horitoki, Bohera, Mahogany, Palm Tree, Chambal, Rain Tree, Shil koroi, Satim, Sishu (including protection, fencing and conservation during project defect liability period): Preferably at both sides of Road where space is available (fencing as per LGED rate schedule 5.26.14) (Contractors will also be instructed by the consultant and PIU prior to the tree plantation work) at an interval of 10 feet.	80 nos.	@ Tk. 1000	80,000
9.	**Motivation training** Motivation training (twice: before and after construction start) of the Upazila Engineer 'sand Contractor's representatives on safety practice and as per direction of the E.I.C.	1 no.	LS @ Tk. 10,000	10,000

Sl no.	Description of item	Quantity	Unit price	Total amount
10.	**Waste disposal facility** Temporary camp site waste disposal facility improvement 2 nos. (1 no of organic waste and 1 no of inorganic waste disposal facility) and as per direction of E.I.C.	LS	@ Tk. 5000	5,000
11.	**Water Test (Drinking Water samples)** Water samples are to be collected periodically (half yearly) from the tube well at labor shed area for laboratory analysis of different parameters such as pH, arsenic, iron, chloride, hardness, total dissolved solids, nitrate, nitrite, coliform, electrical conductivity etc. all complete as per direction of E.I.C. (including the cost of actual fees for testing from reputed laboratory and report) as desired by E.I.C.	LS	@ Tk. 5000	5,000
12.	**Working labour shed:** Construction of Labor shed (Size: 30'x20') with C.I sheet Roofing, Tarza fencing and brick soling floor as per requirement and direction of the E-I-C.	1 no.	LS @ Tk. 30,000	30,000
13.	**Environmental management** Environmental management costs of the Environment & Social/ Safeguard Personnel for Environmental and Social Management and Monitoring during construction and operation phase for their salary & transport (Net payment excluding Tax &VAT). And as per direction of the E.I.C. **(One Safeguard Personnel for R1, R2, R4, R10, & R13)**	1 person	Monthly basis @Tk. 35,000.00 for 12 months. One person covering 5 roads i.e.35,000Tk.*12months*(1/5 one road).	84,000.00
	Subtotal Bill: Environmental facilities			**443,420.48**

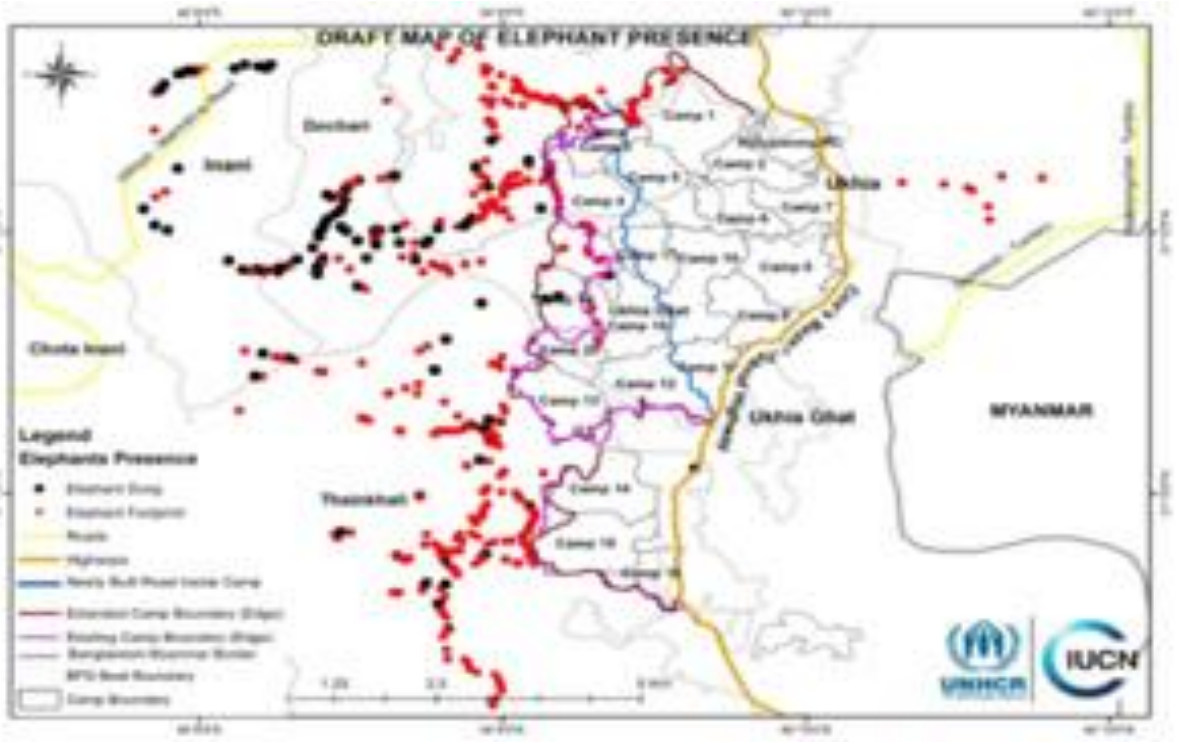
Cost of H&S Measures under COVID 19 Situations for W23-2

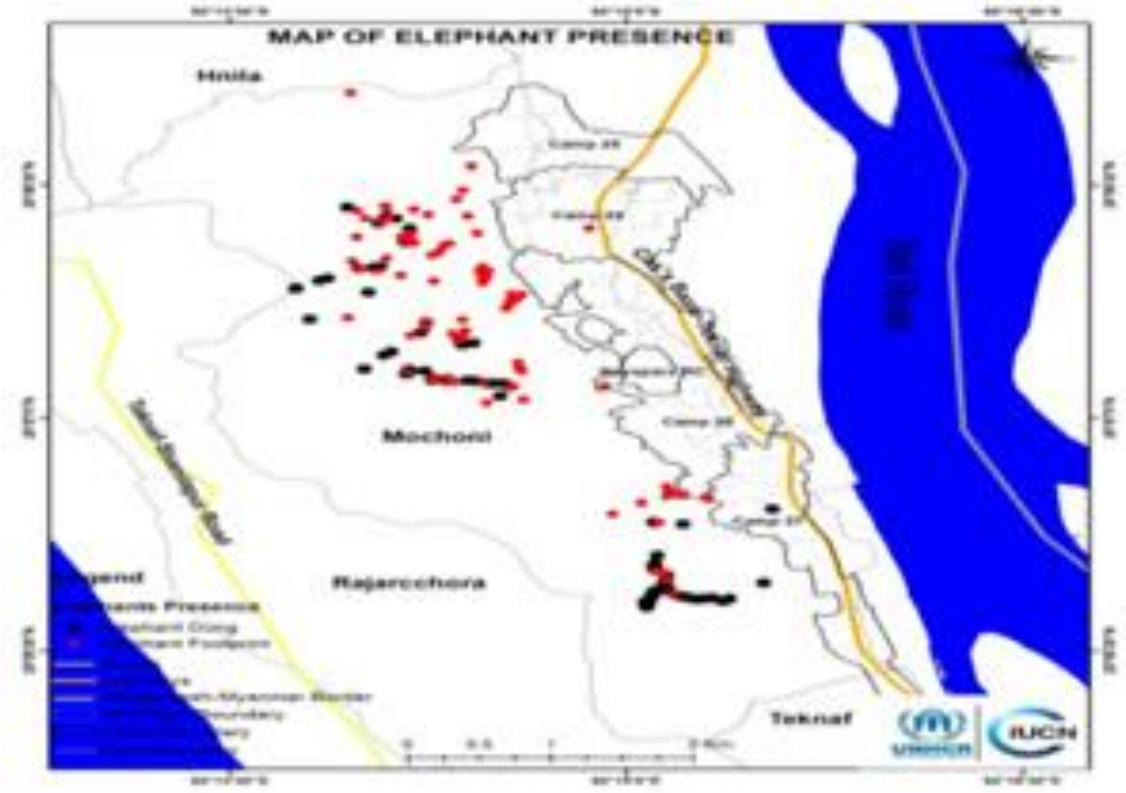
Considering the emerged situation, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites. The cost is estimated counting 16 workers for 270 active working days (9 months in a year) in a contract period for one site under this package (EMCRP/W-23.2).

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
1.	Non-Contact IR Digital Thermometer	01 nos. in each site	N/A	N/A	5,000.00	1	5,000.00	Each site office will have a thermometer for checking body temperature every morning at the entrance of the working site
2.	Wash Basin with Small Water Tank, Bucket and Mug (or piped water supply)	01 nos. in each site	N/A	01 nos. in each camp	10,000.00	2	20,000.00	Wash basin to be installed at favorable locations immediately after the entrance to the facility
3.	Trash bin (covered)/Paddle Bin	01 nos. in each site	N/A	01 nos. in each camp	550.00	2	1,100.00	
4.	Bar Soaps (150 gm each)	43		54	50.00	97	4,850.00	To be placed in a case/holder on the basin, for washing hands for max. 19 people a day and showering of 16 workers in each labor camp.
5.	Hand Sanitizer (2 nos. 250 ml bottle and 5 liter Can for Refill)	2 bottles and 1 Can for each site	N/A	N/A	4,000.00	1	4,000.00	2 bottles and a 5 litre can for each Site office

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
6.	Face Shield/ Protective Safety Goggles	10 nos. for each site		N/A	400.00	10	4,000.00	For labors who work in close contact, 10 in each site
7.	One time Mask (Disposable) for Contractors' Staffs	3 nos. each day in each site		N/A	12.00	810	9,720.00	Reusing N95/KN95 mask will not be a manageable option in field scenario, one time disposable medical/surgery mask a good option instead.
8.	Cloth mask for Workers	N/A	16 nos. for each labor camp		35.00	288	10,080.00	A worker will use a mask for 15 days with everyday washing
9.	Floor Cleaner (1 litre Can)	1.5 Can	N/A	1.5 Can	250.00	3	750.00	
10.	Detergent Cleaner	N/A	1 kg in each camp/month		400.00	9	3,600.00	To be used for washing clothes, masks and tools & equipment, etc.
11.	Miscellaneous cost				20,000.00	1	20,000.00	Contingency cost for medical emergency and compensation for workers, subject to proper documentation
	Grand Total						**83,100.00**	

Appendix-4: Elephant Migration Routes Map





Elephant presence map (latest information published on 24 May 2018)

Appendix-5: Location Map of the Sub-project component

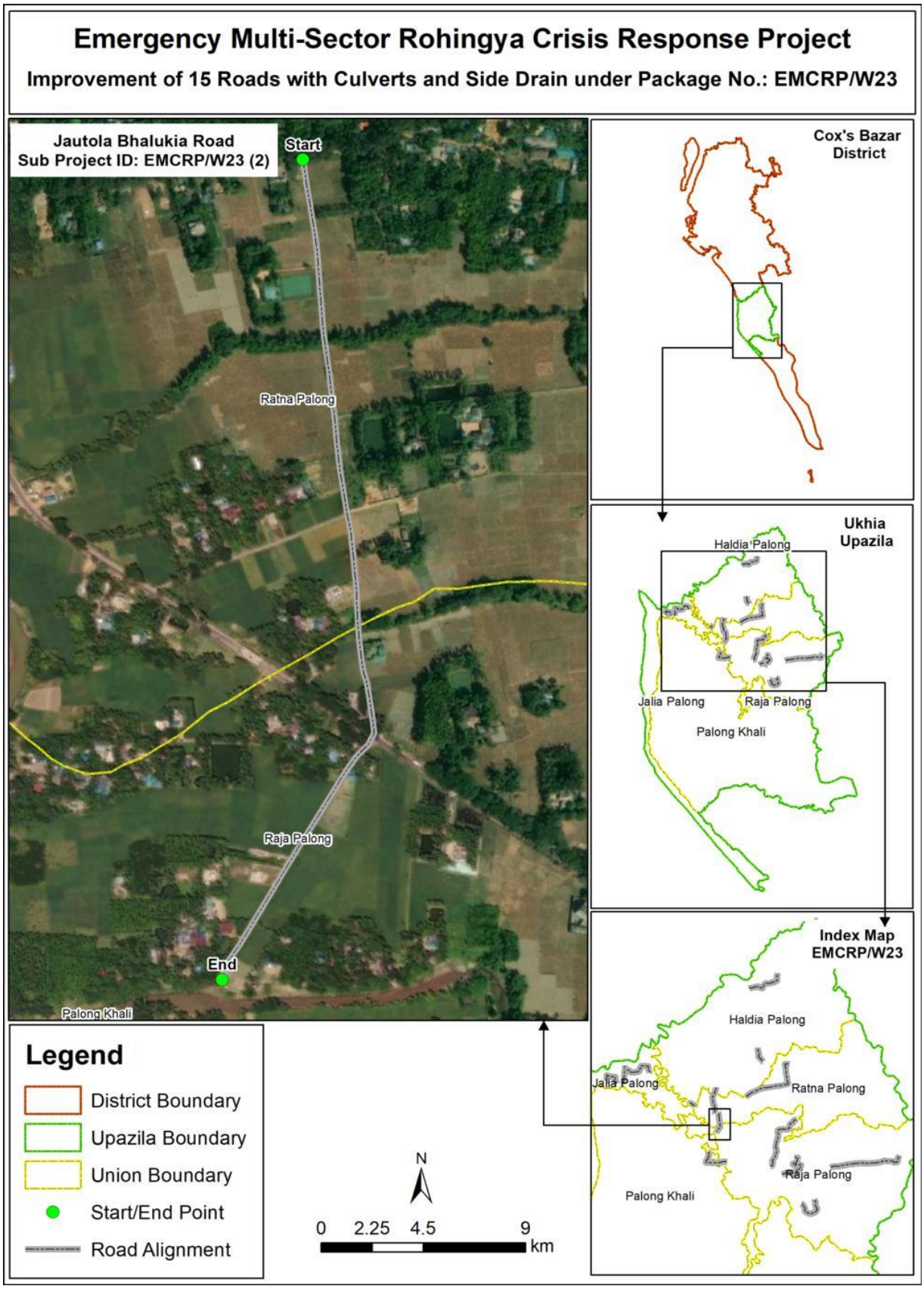
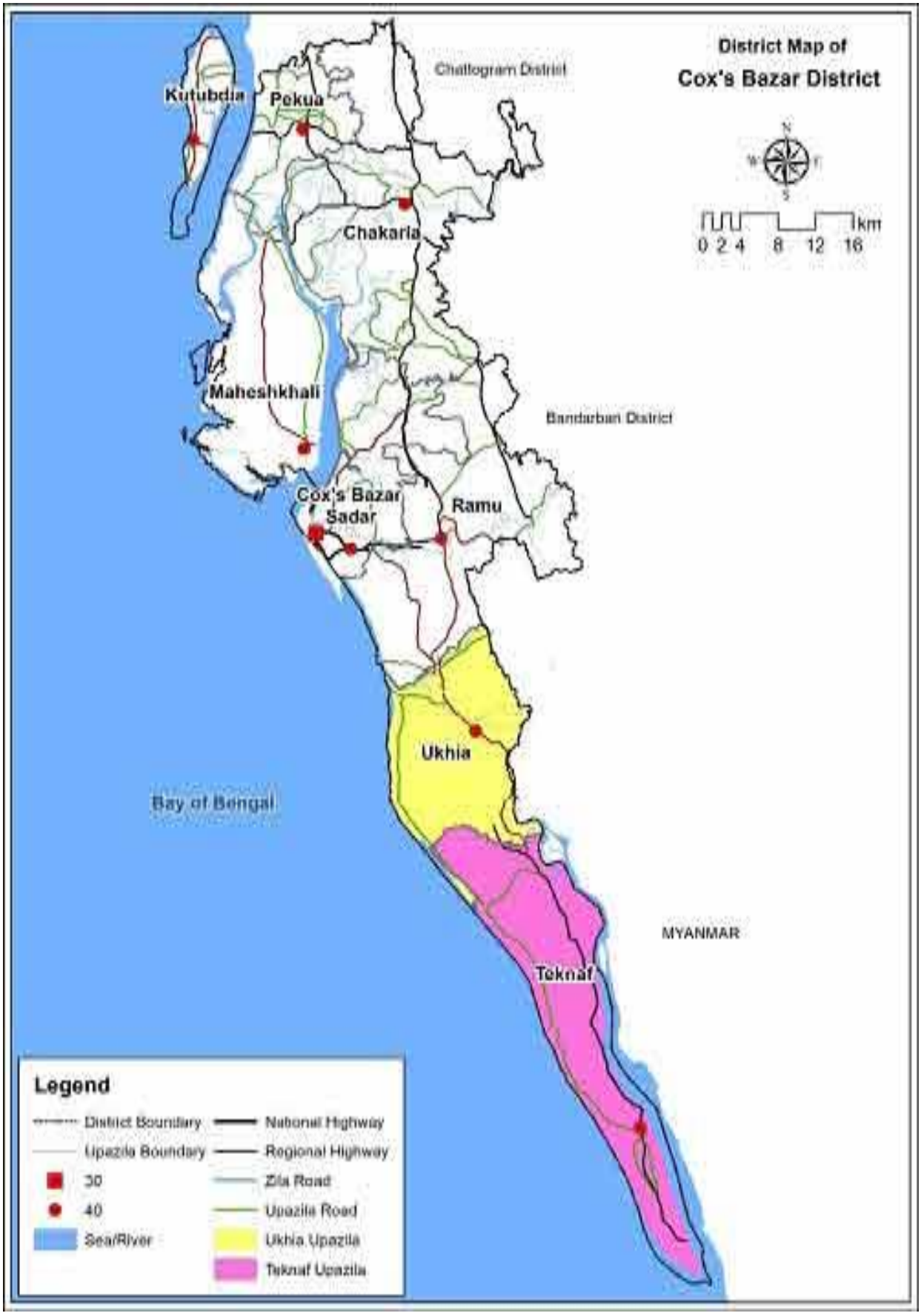


Figure: Location Map of W23-2



District map showing Ukhiya and Teknaf Upazila

GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH
Ministry of Local Government, Rural Development and Co-operatives
Local Government Division
Local Government Engineering Department

Emergency Multi Sector Rohingya Crisis Response Project (EMCRP)

Project ID: P167762 **IDA Credit No. 5561-BD**





Environmental Screening Report

For Rumka-Rumka bazar Road with culverts and side drain under Cox's Bazar District.

Under the package no. EMCRP/W23

Funded by:

THE WORLD BANK
IBRD • IDA

Government of the People's Republic of Bangladesh & World Bank

Design and Supervision Consultancy:

ddc Development Design Consultants Ltd.

October-2020

Contents

1. INTRODUCTION 1

1.1 Project background 1

1.2 Elementary information of Work Package Components of W23.3 2

1.3 Proposed intervention items of sub-projects 5

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS 5

2.1 Methodology 5

2.2 Important features/establishments within the PIA 6

2.3 Issues and Recommendations raised by the Participants in regards to component interventions for W23.3 8

3. ENVIRONMENTAL SCREENING 10

3.1 General 10

3.2 Major Findings 10

3.3 Climate Change Impact Screening 13

3.3.1 General Overview of the area 13

3.3.2 Site Specific Screening and outcome 14

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) 15

4.1 General 15

4.2 Health and Safety Measure under COVID Situation 18

4.3 Cost of Environmental Enhancement Works in BOQ 19

5. LIMITATION OF THIS STUDY 19

6. CONCLUSION AND RECOMMENDATIONS 19

Annexure-01: Important Environmental Features (IEFs) near site: 21

Annexure-02: Attendance of consultation meeting 22

Annexure-03: Pictures of sub-project component location and surrounding features with public consultation 23

Appendix-1: Environmental Screening Form for examining sub-project component 24

Appendix-2: Environmental and Social Management Plan (ESMP) 42

Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.3 50

Appendix-4: Elephant Migration Routes Map 56

Appendix-5: Location Map of each Sub-project 57

ACRONYMS

BOQ	Bill of Quantities
BFS	Brick Flat Soiling
D&SC	Design and Supervision Consultant
DoE	Department of Environment
DRP	Displaced Rohingya people
EA	Environmental Assessment
EC	Electrical Conductivity
EMCRP	Emergency Multi-Sector Rohingya Crisis Response Project
ESMP	Environmental and Social Management Plan
ERP	Emergency Response Plan
ESMF	Environmental and Social Management Framework
FDMN	Forcibly Displaced Myanmar National
FGD	Focus Group Discussion
FSM	Faecal Sludge Management
GBV	Gender Based violence
GPS	Government Primary School
GRM	Grievance Redress Mechanism
HBB	Herring Bone Bond
IEFs	Important Environmental Features
ISCG	Inter Sector Coordination Group
IUCN	International Union for Conservation of Nature
IWM	Institute of Water Modeling
LGED	Local Government Engineering Department
PIA	Project Influence Area
PIU	Project Implementation Unit
PMU	Project Management Unit
PPE	Personal Protective Equipment
PSC	Project Steering Committee
SMC	School Management Committee
SPM	Suspended Particulate Matter
SWM	Solid Waste Management
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
UNHCR	The United Nations High Commissioner for Refugees
VAT	Value-Added Tax
WB	World Band

1. INTRODUCTION

1.1 Project background

An estimated 730,000[1] people of Rohingya community has fled to neighboring Cox's Bazar district of Bangladesh since August 25, 2017 to escape extreme violence in Rakhine State of Myanmar, which caused the total number of Forcibly Displaced Myanmar National (FDMN) in the district to be about 923,033[2]. This huge number of displaced population account for about one-third of the total population of Cox's bazar, a district which was already facing many development challenges and suffering from resource-constrained social service delivery system even before the crisis evolved and the mass exodus of FDMN has worsened the situation further. Almost all of these displaced people are hosted in Ukhiya and Teknaf Upazila of Cox's Bazar, in extremely congested settlements in areas having very minimal access to basic infrastructure and services and is prone to natural disasters. The Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP) has been designed in order to reduce the vulnerability of Forcibly Displaced Myanmar National (FDMN) along with people from the host communities in Teknaf and Ukhiya Upazila under Cox's Bazar District, to different disasters and improve the social service delivery system and disaster resilience to both the communities. This project will follow a sustainable development pathway that is resilient to disaster and climate change effects.

The objective of the Project is to provide greater protection for the FDMN and host communities through:

- Reducing the vulnerability to natural disasters
- Improving social service delivery system and providing better communication facility through physical interventions
- Improving water and sanitation facilities
- Reducing vulnerability to accidental fire
- Provisioning better educational facilities and
- Strengthening and scaling up of GBV prevention services to the FDMN

The project is jointly being implemented by Local Government Engineering Department (LGED), Department of Public Health Engineering (DPHE) and Ministry of Disaster Management and Relief (MoDMR) under their respective mandate and scope of works. Apart from the interventions in Addressing Gender and Social Inclusiveness and Preventing Gender Based Violence with the Support from UNFPA and building Communication and Awareness among all affected parties through an effective engagement of BCCP (Bangladesh Center for Communication Programs) in the areas, LGED is implementing a good number of infrastructural facilities, namely improvement of hat bazars, roads (both inside and outside of the camps), bridges, culverts, construction of School cum multi-purpose disaster shelters, Satellite Fire Stations, Relief Distribution Center, Community Service Center and many other different types of facilities. Given the project interventions, sensitivity of the areas and volume of people in or around the sites, the project is more likely to trigger certain Operational Policies and Bank Procedures, namely Environmental Assessment (OP/BP 4.01), Natural Habitat (OP/BP 4.04), Forest (OP/BP 4.36) and Physical Cultural Resources (OP /BP 4.11).

[1] ISCG: Situation Report Rohingya Refugee Crisis, (September 27, 2018)
[2] IOM Needs and Population Monitoring round 12 as of October 10, 2018

1.2 Elementary information of Work Package Components of W23.3

It is imperative to recognize proposed components under Work Package-23.3 in Ukhiya Upazila in order to assess and verify its interventions according to stipulated screening requisites from WB. Acknowledging this matter, such details are accounted for as given below in Table 1.2.1 along with visual presentation (General Upazila Map) given in Figure 1.2.1. Aerial maps for each sub-project is given in Appendix -5.

Table 1.2.1: Basic Featured Information of components [Sources of data: Field survey, 2020: DDC & LGED]

COMPONENT'S NAME UNDER W-23.3	GPS COORDINATES	DISTANCE FROM UPAZILA HQ	UNION	WARD	LOCATIONS UNDER PROJECT INFLUENCE AREA	PRE-EXISTING CONDITION OF ROAD	PROPOSED ROAD TYPE	ROAD DIMENSION(M) (LENGTH X WIDTH) = FOOTPRINT (SQ.M) *
RUMKA-RUMKA BAZAR ROAD ID:422945005	**Starting Point** $21^0$16'31.0" N $92^0$06'00" E **Ending Point** $21^0$16'35.0" N $92^0$05'53.0" E	6.5 Km	Ratnapalong & Haldiapalong	9 (Ratnapalong) & 9 (Haldiapalong)	West Ratna, Rumkha Bazar	HBB	Bituminous Carpeting (BC)	(372m X 4.9m) = 1,822.8 sq.m

*Note: Roads are proposed to have average carriage way of 3.7m with 0.6m shoulder on each side; special conditions may prompt further adjustments while in construction period. However, footprint for roads are calculated with an average of 4.9 meters.

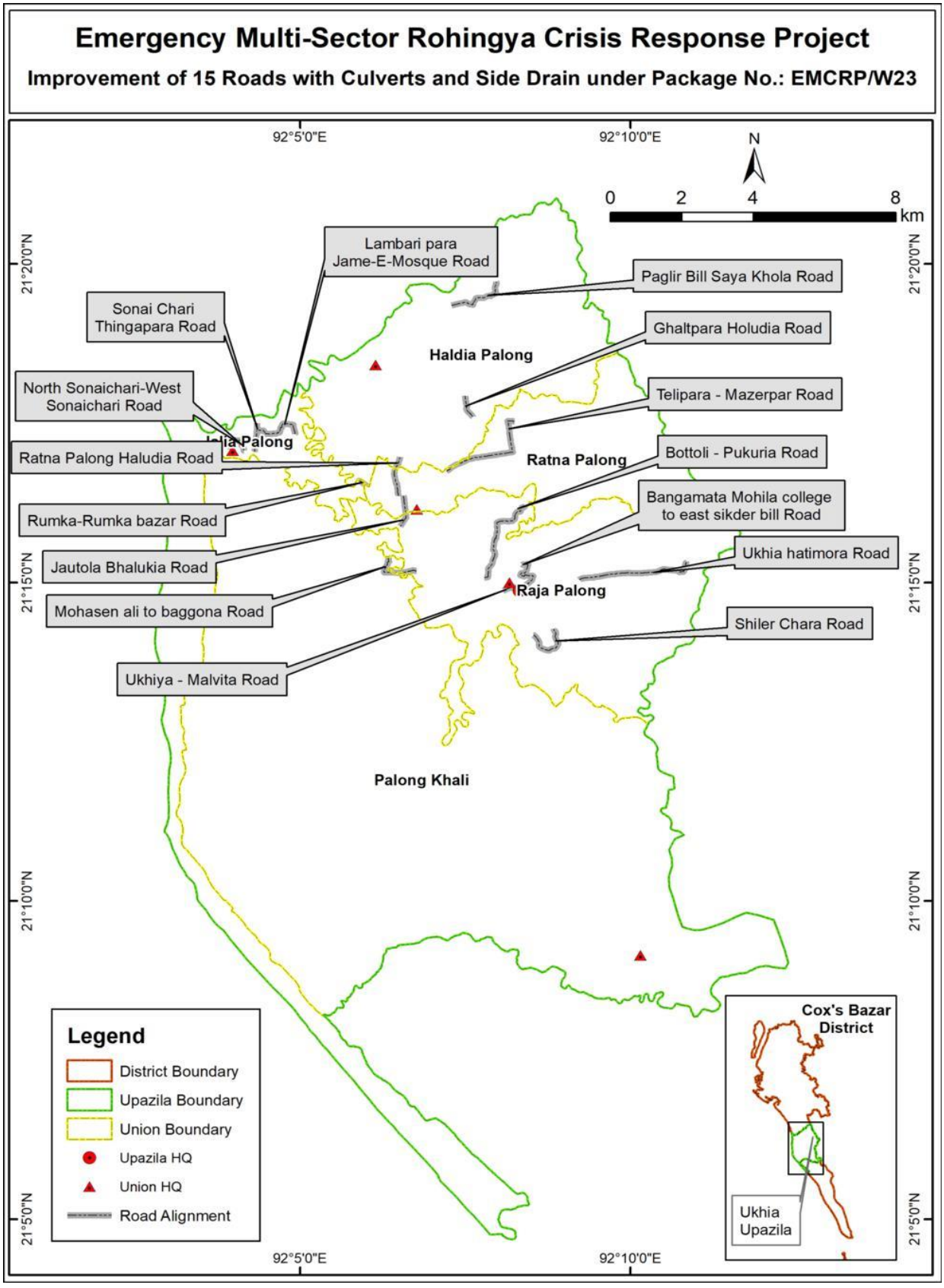


Figure 1.2.1: Map illustrating Roads of Work Package EMCRP/W23 locations in the Ukhiya Upazila

1.3 Proposed intervention items of sub-projects

The roads under work package W23.3 have been proposed with specific need basis dimensions to accommodate and ensure best quality interventions for local stakeholders. In context of governing environmental circumstances and geo-meteorological conditions, protection work items have been added to construction design for safety and sustainability of each proposed roads. These roads are abutting agriculture hence, construction and improvement works will descent these roads into new circumstances in some parts. These items have been included on the basis of field survey and analysis of these conditions. Please follow the table to acknowledge these items.

Table 1.3.1: Proposed safety interventions of sub-project for W23.3

W23-3: Rumka-Rumka bazar Road Id:422945005
Construction of 02 nos. Cross Drain (dimension: 0.975mX 0.975m) at Ch. 254.0m & Ch. 350.0m of chainage and construction of **35.0m Palisading work** at different Chainage, Construction of **Earth** works, **Road safety** works and **Environmental Mitigation and Enhancement** works. Description of Environmental Mitigation and Enhancement works can be found in BOQ attached in Appendix-03.

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS

2.1 Methodology

Public participation and community consultation have been taken up as an integral part of environmental assessment process of the project. As part of the impact assessment, participatory public consultation was conducted in areas of concern for proposed road by the field level staffs and consultants from PIU and D&SC. The consultation meeting was attended by disparate social groups representing local habitants, separate age groups, social class and occupations. In some cases, IUCN employees in charge of elephant watch tower were present where frequent elephant movements occur. The participants were also selected from different segments of stakeholders, and some of whom will have major active roles before, during and even after the construction works. Therefore, the meeting was organized in an informed, expressive and unbiased manner, wherefrom different views and concerns came across which will be properly taken care of during the design and construction phases. In order to serve our screening process, relevant items were thrown towards the audience to discuss and troubleshoot confusing or worrying matters regarding the proposed intervention under package work. Impacts in regards to environment, socio-economic matters during pre-construction, construction and post construction phase has been put forth. Possible mitigation measures and relevant needs have turned out during these sessions as well. Moreover, their comprehension as a stakeholder has been up lifted in light of project guidelines.

However, public consultation is a living process as the types of problems/ difficulties, involved parties or stakeholders and mode of settlement or resolution processes are more likely to differ with time. Thus, consultation with different parties or stakeholders will be continued throughout the sub-project implementation period and records of resolutions, whatsoever and wherever possible, will be kept in writing at the site and made available on any enquiries or requests by all parties concerned.

All components under the work package have been put through review for locating impediments or possible adversity effecting future environment and socio-economic conditions. In order to comprehend surrounding features and impacts which may stipulate with it, screening has acknowledged having a Project Influence Area (PIA) of 0.5-kilometer radius. Sensitive findings have been identified if any, and relevant mitigation or minimization measures were suggested to subdue such complication for over the project construciton period. Moreover, evaluation was inspired to enhance environmental features and include monitoring initiatives under ESMP budget to ensure exertion of environmental improvement propositions. Contractor's responsibility has been taken into account while identifying possible impacts through sets of intervention accounts. These steps have been initiated strictly following ESMF guidelines and requirements. Environmental screening procedure was motivated by ingredients highlighted in Appendix-2 of ESMF. During survey, detail chainage length of the sub-projects was taken into account for detailing environmental and socio-cultural features within 100 meters buffer zone of both Left and Right side from the center line of the road. Longitudinal intervals of 300 meters have helped to identify positions of sensitive or near-sensitive socio-cutural features. These findings are illustrated in **Annexure-01**.

2.2 Important features/establishments within the PIA

Initial screening process is conducted through direct involvement of PIU and D&SC in the influence area of the proposed component, which allows to raise significant questions and ideas towards participants. In combination of both field walk-through and inputs of audience, a register of existing features is formed. Allow the following table to describe such elements in all the work package components.

Table 2.2.1: Important features within Project Influence Area for W23.3

Component's name under W-23.3	Direction	Important features/ establishment (approx. distance from the proposed site)
Rumka-Rumka bazar Road Id:422945005	North	Sree Hori & Dhan Mondir (5m), Fokirer dorga (200m), ATM Jafor Alom diabetics Hospital (1km), Chowdhurypara cremation (500m), Chowdhurypara graveyard (550m)
	South	Rumkha bazar Salamia Hafizia jame mosque (5m), Rumkha bazar (8m), West Ratna GPS (500m), Reju khal (600m), Palong Public School (100m)
	East	Courtbazar (400m), Courtbazar jame mosque (500m)
	West	Rumkha bazar Panjegana jame mosque (12m), Rumkha Moni Market (300m)

2.3 Issues and Recommendations raised by the Participants in regards to component interventions for W23.3

After inauguration has set in motion, their valuable opinions and remarks came pouring out. At this point, we find our field base knowledge for assessment attributed impact degrees and possibilities. Please follow the table 2.3.1 given below to recognize participants' inputs arranged in relevance with this component. Consultation meeting summary, attendance sheets and pictures of separate meetings with proposed location for this sub-project component can be found in Table 2.3.2 and Annexure-02 and Annexure-03 respectively.

Table 2.3.1: Issues and Recommendations raised by the Participants

COMPONENT'S NAME UNDER W-23	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
RUMKA-RUMKA BAZAR ROAD ID:422945005	•They are very much concerned with absence of reliable path route under Ratnapalong & Haldiapalong Union at west Ratna as well as Rumkha Bazar areas. • This road is also used as Rumkha Bazar connecting road •Lack of proper and strong road keeps motor vehicles from accessing these locations. • Heavy transports are prone to accidents due to bad road conditions. •Possible dust and noise pollution during the construction works should be considered. •Safety of children and adults at the sites during construction works. •Elephant movement is not present. •Local community wish to have a better drainage system along with the road in order to allow waters from undulated terrains to find an uninterrupted pathway not causing harm to agriculture fields and wash away top soil of adjacent grounds residing alongside the road. It will protect the top soil for future growth of crops and aid vegetable farming. •The participants have expressed their greater interest for this intervention and believes this will bring nothing but prosperity for the entire catchment dwellers. •Household fences along the road should not be affected while	• Local people considered that the selected site is suitable for the construction of this road from both the technical and social-environmental (direct savings in the cost of operating vehicles, time savings by travelers and freight, wider effects can less accident rates, road being waterproof and dust free, much more durable) point of view. It will provide better mobility and access to services in due time. •The road should consider water flow during rainy seasons thereby ensuring the construction is not affected by mass water flow. •Enough pathway is expected for vehicle movement so that comfort travel is achieved. •Construction site safety should be ensured to avoid any mishaps or accidents during work periods. •They considered small lumbering of plants and suggested tree plantation initiatives. •They also requested to involve the local community to construction work and they will welcome any outside key labor. •During construction period, alternate route to pass through this area is available. •Since the road is passing alongside homestead gardens, the intervention will invite air pollution on moderate level during construction period. However, preventive actions and measures can be taken to keep air quality from degrading. • Women should be recruited equally, wherever possible . •Participants, made certain that they will provide surveillance over raw materials and material storage area. •They have also ascertained that the selected site is free from any events related to

COMPONENT'S NAME UNDER W-23	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
	construction • No trees should be harmed for preparation of this road; however, some trees will fall for this intervention at several locations, around 5 trees. • Available pathway to usher material delivering vehicles • Labor shed availability in the target location •Identification of material storage location based on consultation with local communities •The proposed road is to cross Vorakhali chorra and Katakhali khal which is seasonally streamed with water, Specially in rainy seasons.	resettlement and major environmental impacts. The adverse environmental impacts that may come in the way of air quality, noise, solid waste, occupational health & safety during the construction period, and will be of short duration, yet proper management/conservative options should be adopted. • Bituminous Carpeting (BC) road called Courtbazar-Marine drive connecting road is available for access of material delivering vehicles. •On the alongside of the road since there are available open private lands are used as labor shed and material storage can be arranged •Intervention should consider necessary preparations and mitigation measures so that this water stream is not restrained in any form.

Table 2.3.2: Consultation Meetings Summary

Road Package Number	Date DD-MM-YYYY	Venue	Main Participant Groups	No. of Participants	Remarks (If any)
W23-3	06-10-2020	Rumkha Bazar	Host Community	09	The local individuals, elites, chairman and/or member of respective Union Parishad, representatives from different agencies participated in those consultation events.

3. ENVIRONMENTAL SCREENING

3.1 General

This section identifies the potential impacts that the various elements of the proposed Project may have on the physical, biological and socio-economic environment within half a kilometer of the radial distance around the site. Environmental Assessment (EA) based on this screening study for the Sub-project has been conducted to identify and determine which potential Project impacts may be significant and therefore require the application of reasonable and effective management and/or mitigation measures.

In order to realize the exact physical, biological, socio-economic and environmental impacts of the proposed sub-project sites and the influence area in regards to the implementation measures, an extensive field visit was carried out in each proposed sub-project PIA. Environmental Screening form, as adopted in **Appendix 2** of the Environmental and Social Management Framework of EMCRP, was administered for identifying the impacts and their extents.

The screening data and information for this sub-project component under this work package and details screening summary have been formulated and shown in **Appendix-01.**

3.2 Major Findings

A complete view of current environmental conditions of individual sub-projects in relation to interested queries has been congregated in order to understand the degree of impacts corresponding with marked interventions. Interestingly, most sub-project has correspondence with its surrounding features and upholds interchangeable impacts. However, the degree is not an interchangeable factor since scale is not parallel to each of these components which is where, mitigation measure differentiation is implied. There are some cases where unique circumstances have been met with while environmental screening took place which is also accounted for and should be a matter of concern for other parts of the ESMF initiative. The significant issues observed this sub-project component is enlisted in following Table 3.2.1 with pertaining impacts. Moreover, impacts that are adventitious has also been embraced for promoting best practices.

Table 3.2.1: Concerning environmental issues relating to each proposed subproject and influence area for W23.3

COMPONENT'S NAME UNDER W-23.3	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
RUMKA-RUMKA BAZAR ROAD ID:422945005	It is not located within any major environmentally sensitive area.	It will not cause any severe negative effects to the environmental settings of the area neither to important environmental features.
	Construction period will induce air pollution while preparing for bitumen and loading-unloading raw materials. Impacts on air quality during the construction phase may turn to negative. The main impacts include dust generation from crushers, vehicles and the transportation of all types of construction materials.	It will invite waste production which may in turn cause minor air pollution due to deposited dust and airborne particles less than PM_{10}. Dust pollution may slightly suffocate photosynthesis however this can be minimized through regular water sprinkling as suggested in ESMP.
	Noise emission from construction machineries and equipment can cause nuisance to local residents and workers.	The ambient noise level might have potential to increase temporarily and intermittently in the close vicinity of active construction fronts.
	Some ditches, electric pole and significant vegetation coverage is located in the ROW or does it stand over such items. However, boundary fences, settlements and homestead gardens are found beside the road.	No ditches or any vegetation coverage will get degraded or lost for construction. Liquid waste such as left-over oils or chemicals might run into these adjacent features.
	Construction works will involve chemical usage and preparation of on-site add-ons to the road. Generating scraps and residues.	The runoff from work site may enter existing water body and frustrate the water quality which will be acute however.
	Elephant Movement is not present in the vicinity of the subproject location.	No impact is expected here
	No heavy earth excavation work will be involved.	Consequently air, noise and dust pollution will be occurred within a small-scale during construction period only.
	Construction related activities and setting up of labor camps along with associated facilities and their management can cause adverse impacts.	Noise pollution from grinding and mixing, air pollution caused by dust or gaseous emissions from vehicle movement, running of motorized equipment and land clearing, odors and soil pollution from leaking of latrines and fecal sludge, will more likely to take place.
	Chemical spills or improper disposal of construction waste materials due to lack of worker training and misconduct of contractor's safety initiatives.	During the construction period, soil may get contaminated from activities such as handling of hazardous construction materials (such as fuel, lubricants, paints, and solid waste and sewage).

COMPONENT'S NAME UNDER W-23.3	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
	Vibration effects generated from grinding, mixing, drilling or other construction works	Any vibration would result in nuisance effects to nearby faunal species, and but will be localized and temporary and will unlikely to result in structural damages to buildings or walls of the adjacent private properties.
	Sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site are at north side Sree Hori & Dhan Mondir (5m), Fokirer dorga (200m), ATM Jafor Alom diabetics Hospital (1km), Chowdhurypara cremation (500m), Chowdhurypara graveyard (550m), at south side Rumkha bazar Salamia Hafizia jame mosque (5m), Rumkha bazar (8m), West Ratna GPS (500m), Reju khal (600m), Palong Public School (100m), at east side Courtbazar (400m), Courtbazar jame mosque (500m) and west side Rumkha bazar Panjegana jame mosque (12m), Rumkha Moni Market (300m).	No disturbance to all these establishments/features is anticipated due to construction activities for the sufficient distance from the construction site, and strict construction site management system- including restrictive work schedule during the daytime only, water-sprinkling twice a day on and around the site, safe storage of materials, etc.

A few incidents of human elephant conflict have been reported in 2018. The IUCN has conducted a study on such conflict. With the support from UNHCR, IUCN has been marking elephant routs and corridors and informing local communities and stakeholders of avoiding the marked areas. As part of the mitigation options, different initiatives have been undertaken, such as formation and capacity development of Elephant Response Teams (ERTs); providing equipment to ERTs to divert in-coming elephants; and setting up elephant deterrent tools (e.g. trip alarms and watch-towers). Though the current chances of occurrence of conflicting incidence are zero, any recurrence would be managed by the ERTs and they will be called if there appears any minute possibility to recur. A map of elephant movement is given in Annexure 04.

In order to offset the loss or attenuating the environmental degradation, a set of mitigation measures will be adopted, on top of general practice of standard construction procedure or following the relevant codes of practices.

3.3 Climate Change Impact Screening

3.3.1 General Overview of the area

Cox's Bazar is one of the coastal districts of Bangladesh and is prone to the effects of climate change due to its geomorphological siting and climate induced effects. The hilly tracts of Cox's Bazar could foster further environmental crisis brought on by indiscriminate deforestation and diminishing groundwater reservoirs, which have been taken place in recent months as the Rohingya crisis evolved. A recent study conducted by World Bank[3] has found that Cox's Bazar will be the worst-hit district in South Asia as average temperatures rise and rainfall patterns become disruptive, by 2050, if greenhouse gas emissions continue unabated.

The hilly region of the country, especially the part in Cox's Bazar is characteristically of muddy soil structure, not of any rocky formation and the stability comes from the roots of the trees. Also rainfall, proximity to the sea, elevation, and land cover are very important factors for analyzing the risk of cyclone. Denudation of trees from hilltops in order for the huge settlement of Rohingya people has already increased the vulnerability to the risk of hill collapse by destabilizing the terrain. Also deforestation at a rapid speed uncovers the land and raise the risk of occurrence of cyclones, as forests protect land from high wind and storm surges where demolishing the trees would make the area vulnerable.

Together with the above-mentioned hazardous situation, again due to sudden extraction of huge amount of groundwater, availability of potable water from shallow tube wells that pump water up from about 150 feet has already reached to a critical level. Averting the problem requires new tube wells to be plumbing deeper into the poorly mapped aquifer, but going deeper than 700 feet in some places may cause salt water to contaminate freshwater resources.

In this case, it is possible that a stationary position of the freshwater-saltwater transition zone can be established via proper management of pumping in the confined aquifer.

The groundwater resource is seen to suffer more from the climate change impact. The impact on groundwater due to climate change impact include

- Sea-level rise could result in a transgression of the sea and a loss of land area. This could also lead to the secondary effect of population migration in the new coastal band due to migration of the coastal population from the encroaching sea, thereby increasing domestic water needs in the new coastal area.

- Transgression of the coast implies that saline storm surges of 1 or more meters depth would penetrate beyond the new coast to new land areas. Storm surges transport saline water far inland of the coast and much of this floodwater may infiltrate the ground in areas where the aquifer is not fully saturated. Even where the aquifer is saturated, denser saline water may

[3] https://openknowledge.worldbank.org/bitstream/handle/10986/28723/9781464811555.pdf

sink into the aquifer during the flood and later from pools of saltwater that remain following the flood[4].

- It has been identified that the salinity is found in the shallow aquifers along the coastline. So the salinity which are found in the groundwater are of lesser concern as salinity will subside over time

- Several researches show that through modeling of groundwater flow that the depletion of groundwater in the host community will persist up until 2022 and the replenishment of water will take place.

Considering the general climate change effects in Cox's Bazar area and offsetting the aggravating environmental situation due to the mass arrival of Rohingya communities, several specific measures including tree planation in sub-project areas, rainwater harvesting from every disaster shelter, construction of drainage facilities along the road length and installing thunder arrester across the areas, have been suggested and will be implemented.

3.3.2 Site Specific Screening and outcome

Climate Change impact on a particular subproject is tough to deduce as the highest resolution of climate model simulation done over Bangladesh is 50km. Depending on the simulation ensemble of Cox's Bazar district, the temperature and precipitation are likely to increase with time.

Site specific climate change impacts are often not so easy to measure or deduce plausibly while the site is confined to a narrow strip of roadways, and associated mitigation or offsetting measures are really hard to plot on the impact areas, though an overall set of measures are often considered in practical aspect. Fig:1 shows the inundation risk map of the subprojects under W-23, none of the subprojects are in vicinity of the severe river flood inundation area. So the risk of flooding is low around the sub-project area

[4] "Implications of Climate Change for Fresh Groundwater Resources in Coastal Aquifers in Bangladesh", World Bank report.2010

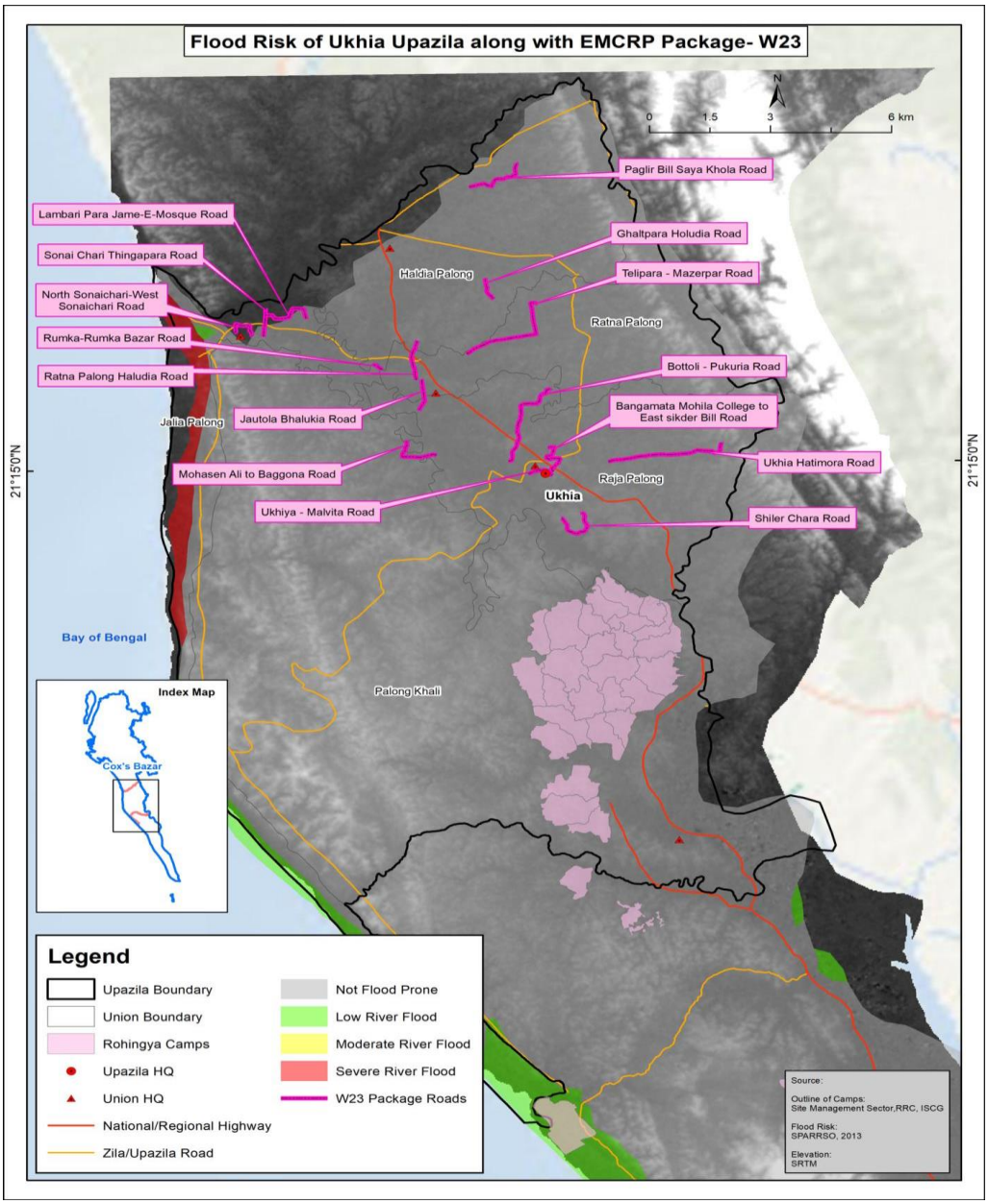


Figure 3.3.2.1: Flood inundation risk map near the subprojects.

Also, in order to avoid the devastation caused by the thunderstorm, state-of the-art thunder arrester (lightning protection system) has been suggested to install having a coverage area of 25,434 sq.m for a single arrester. In addition, tree planation on the road slope/ within the premises is also suggested to sooth the temperature effect and increase the water retaining capacity of soil, at the same time.

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

4.1 General

Considering the environmental settings of the sub-project area, it can be assumed that possible impacts would be largely construction-related, and could be addressed through adoption of good engineering practices; good housekeeping; better *in-situ* construction materials management; and observance of health and safety protocols during the implementation period.

Table 4.1.1: Site Specific Impact and Mitigation Plan under package W23.3

Component's name under W-23	Impacts	Mitigation plan
Rumka-Rumka bazar Road Id:422945005	Sree Hori & Dhan Mondir (5m) to the north, Rumkha bazar Salamia Hafizia jame mosque (5m), Rumkha bazar (8m) to the south and Rumkha bazar Panjegana jame mosque (12m) to the west. Further, some settlements located adjacent to the sub-project area might get affected during the construction period with the generated debris and dust, though for the time being.	Contractor must adhere to the best practice debris management procedure and regular adoption of dust control measures (spraying of water at least twice a day) to minimize the effect to the level best.
	Proposed subproject area arises water logging problem during the monsoon sometimes. On the other hand, some part of the proposed road is passing by the agricultural land. Cross drain will be constructed to terminate rainwater for one side to another side during rainy season and also help for rapidly remove excess soil water to reduce or eliminate waterlogging during monsoon and return soils to their natural field capacity and will help to maintain the water balance of both roadside agricultural lands to provide a sustainable irrigated agricultural system. It will also help to prevent flood and not to allow water to overflow and also help to divert water for farming. Some low land is found beside the proposed road so protection wall and palisading work will be constructed during construction period for used to "correct" the natural slope.	Proposed safety structures are **02 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 254.0m & Ch. 350.0m of chainage and **35.0m Palisading work** at different Chainage, **Earth** works, **Road safety** works and **Environmental Mitigation and Enhancement** works.

Further construction related activities which may result in adverse impacts in the surrounding environment of the sub project must be kept under close consideration and appropriate mitigation and management measures will be taken with due care and vigilance. Once the effects are minimized to its least level and controlled efficiently, it will turn into a welcoming and beneficial project for the local communities. The subproject specific environmental management plans have been outlined in **Appendix-2**. The mitigation measures as well as monitoring program of ESMP have also been incorporated in the management plan.

Environmental quality enhancement: Under the additional financing to the EMCRP project, Forest Department of the Government of Bangladesh will afforest along 200 km of road length area, primarily under the Ukhiya and Teknaf Upazila of Cox's Bazar district in order to offset the environmental and ecological devastation, that had been occurred due to the evolution of Rohingya Crisis, to an achievable level. Many of these road lengths will go through and by the Rohingya Camps, up on the hill and are already denuded of trees or vegetation. Local Government Engineering Department (LGED) will allocate

and channelize the finance to the Forest Department under the said additional financing component and oversee the progress of works with due diligence. However, this enhancement work will improve the environmental quality of the area and reinstate some parts of the ecosystem services to those areas, though primarily.

4.2 Health and Safety Measure under COVID Situation

Apart from the established Occupational Health and Safety (OHS) measures being followed in construction sites, offices, and labor camps, a set of additional measures has to be taken and practiced throughout the daily cycle by each labor, staff and any involved parties, due to the ongoing pandemic coronavirus situation. Staffs and consultants at PIU and D&S, along with the pool of consultants under different firms/agencies for different services, and all the representatives or staffs of construction contractors and suppliers have to play much sensitive, (pro-) active and responsible roles in abiding by the rules and measures by themselves and getting the involved workers and different stakeholders adhered to the same. A detailed guideline containing a set of measures with shared responsibilities has been sketched out in order to fight the exposure and further spread of this potentially fatal situation. This plan or guideline shall constitute an integral part of ESMP measures for every sub-project, though is not included in this report to keep it concise and specific, and the contractor is required to keep the copy of that guideline at every site office.

However, among many other relevant issues, the guidelines emphasize on following line of directives:

a. Contractor must designate one of his employees as H&S/Safeguards supervisor to lead, coordinate and interface in order to fight the COVID 19 situation under the direct guidance of COVID focal at PIU of EMCRP project.
b. All workers, supervising and supporting engineers and staffs, consultants, service providers and other concerned parties must adhere to the personal health and hygiene rules, social distancing, and other protective measures in full in order to protect themselves and contain the infections any further. Necessary training and awareness campaign will be aligned with the specific sub-project scenario and prevailing conditions.
c. General practice of cleaning and hygiene has to be maintained in all project/site offices and camp sites, and supply of necessary PPEs and cleaning /disinfecting materials along with proper use of those is to be ensured.
d. Public consultation and stakeholder engagement are to be carried out considering the prevailing risks of virus transmission in the target areas, scope of interventions and level of ICT penetrations among the target stakeholders, and so on.
e. Necessary protocols have to be established and maintained in case of handling a sick employee or worker, and appropriate compensation to a sick disengaged labor is required to be given with due documentation.
f. Budgeting for suggested protective measures, along with necessary supervision and monitoring for the required interventions has to be ensured.

Following the additional health and safety measures presented in that guideline, sub-project component specific BOQ items have been inserted to supplement the budget considering the country-specific situation, capacities, and scope of interventions. The additional cost to Health and Safety Measures under COVID 19 situation is shown in **Appendix-3.**

4.3 Cost of Environmental Enhancement Works in BOQ

In consideration to the above-mentioned environmental impacts and their mitigation measures for this sub-project component, a set of items are included in the BOQ of this sub-project component. Social Safeguard Personnel for Environmental and Social Management for Work Package EMCRP/W23 has also been added in the whole BOQ in order to take supervision and leadership to organize Environmental Management under Environmental Enhancement Works. The total costing and estimation have included enhancements such as Grass turfing plans, Tree plantation initiatives, Dust Suppression mechanisms. On the other hand, in order to ensure health safety and sanitary measures of workers PPE, First Aid Box, Labor shed, Environmental management, drinking water facility with water tests, Temporary latrine for both male and female as well as waste disposal systems has been accounted for. Ensuring sustainable labor performance in regards to environmental and social considerations motivational training has been taken into account. An overview of the estimation is given below and the detailed estimated cost to implement the ESMP is shown in **Appendix-3**.

5. LIMITATION OF THIS STUDY

Bangladesh government has imposed a nationwide lockdown to curb the spread of the novel coronavirus in the wake of series of deaths and infections. Authorities declared a ban on passenger travel on all sector from March 24 while all public transport on roads have been suspended from March 26 to stem the spread of virus, officially known as COVID-19. All office works have been postponed and an intended visit to the sites for further consultation with the relevant stakeholders has had to cancel due to this crisis. Therefore, some relevant information and arrangement needs awaiting for recovering this pandemic crisis.

6. CONCLUSION AND RECOMMENDATIONS

The overall conclusion is that if the mitigation, compensation and enhancement measures are implemented in full, there will be no significant negative environmental impacts in regards to the selection of location, design, construction, and/or operation procedure of the proposed Sub-project. There will in fact be tremendous benefits from recommended mitigation and enhancement measures and major improvements in quality of life, opportunities in business, trading jobs and ensuring social safety and security will be achieved once the scheme is in operation.

The conclusions of the Screening study can be summarized as follows:

- The communities will receive large benefits through improved infrastructural facilities, transportation & communication etc.
- The short-term negative impacts that may come by the way of air quality, noise, solid waste, occupational health & safety need to be minimized through the management plan.
- The project will create employment for those who live in the vicinity of the construction site and will provide them a short-term economic gain.
- The green belt development, if necessary, for the road site, with large-growing trees at the periphery of the site will give the places a more natural and pleasing appearance.
- A comprehensive Environmental and Social Management Plan (ESMP) has been prepared to mitigate and reduce the adverse impacts that will come out from the Subproject activities.

Implementation of this Sub-project will have large positive impacts to the communities in terms of improved infrastructural transportation & communication facilities, which would eventually develop the socio-economic condition of the catchment areas. So, strong recommendation should be put in place to implement the sub-project within shortest possible period of time, and with great care and efficiency.

Annexure-01: Important Environmental Features (IEFs) near site:

Detail Environmental features within 100m of the both sides from the center line were collected @300m longitudinal intervals. The findings of the survey for the aforementioned road can be seen in the table below:

Table: Detailed Chainage length and features of the Sub-Project component

Road Name	Rumka-Rumka bazar Road Id:422945005 **(W23-3)**		**Total Chainage**	372.0m
Chainage (m)	**Left**	**Right**	**Features**	
000-372	L		Open space, brick boundary wall, building under construction, building, tin shed fencing, shop, building, electric pole, brick boundary wall, pond, mosque, connecting road, betel nut garden, tin shed fencing, tin shed household, Rumkha bazar, big tree, tin shed fencing, tin shed household, Rumkha bazar Panjekhana	
		R	Big trees, ditches, brick boundary wall, building, bridge on Vorakhali khal, bamboo fencing, bamboo bushes, tin shed household, tin shed fencing, bridge on Katakhali khal, tin shed fencing, brick boundary wall, Tubewell, electric pole, tin shed households	

Annexure-02: Attendance of consultation meeting

EMCRP/W23.3

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)
জরুরী ভিত্তিতে রোহিঙ্গা সংকট মোকাবেলায় মাল্টি সেক্টর প্রকল্প
Local Government Engineering Department (LGED)
Public Consultation Participants List

Focus Group Discussion

সময়: ০২:০০ টা তারিখ: ০৬/১০/২০২০

উপ-প্রকল্প/কমপোনেন্ট এর নাম: চরপথা- চরপথা বাজার সড়ক

মত বিনিময় স্থান: চরপথা বাজার

ইউনিয়ন: উত্তোলাপাড়া ওয়ার্ড নং: উপজেলা: বাঁশখালী জেলা: চট্টগ্রাম

সাব প্যাকেজ নং: EMCRP/W-23(3)

অংশগ্রহণকারীদের হাজিরা (পরিচয় ও স্বাক্ষর)

ক্রম নং	নাম	বয়স	পুরুষ/মহিলা	গ্রাম	স্বাক্ষর / টিপসই
০১	[illegible]	৪৬	পুরুষ	[illegible]	[illegible]
০২	আলমগীর হোসেন	২২	পুরুষ	"	আলমগীর
০৩	[illegible]	৩২	"	[illegible]	[illegible]
০৪	মো: [illegible]	৭৪	"	[illegible]	[illegible]
০৫	[illegible] আবুল মঞ্জুর	৪৪	"	[illegible]	[illegible]
০৬	[illegible]	৩৫	"	"	[illegible]
০৭	মো: [illegible]	৪৪	"	"	[illegible]
০৮	[illegible]	২০	"	"	[illegible]
০৯	মো: [illegible]	২৫	"	"	মো: [illegible]

Figure: Attendance of consultation meeting for W23-3

Annexure-03: Pictures of sub-project component location and surrounding features with public consultation



Starting point of Rumka-Rumka bazar Road



Existing Boundary on the both side of the road



Mosque & Settlements on the side of the road



Religious point on the side of the road



Permanent settlements on the both side of the road



Consultation meeting with local community

Figures: Present condition of Rumka-Rumka bazar Road (W23-3) & Public Consultation meeting with Host community

Appendix-1: Environmental Screening Form for examining sub-project component

Environmental Screening Form for Sub-project W23-3

Sub-Project Description Form:

Name of Sub-Project: (Improvement of 15 Roads with culverts and side drain under Cox's Bazar District. EMCRP/W23).

Name of the component: Rumka-Rumka bazar Road Id: 422945005

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Estimated total cost of sub-project (in Taka): 417,036,298.10 Tk.

Estimated construction period duration: 1 year

Estimated total cost of the component (in Taka): **5,627,450.09 Tk.**

Estimated Operation and Maintenance period (life of sub-project): Project design life more than 15 (Fifteen) years but Government policies on how long projects can operate in the camps.

District: Cox's Bazar **Sub-District**: Ukhiya **Union**: Ratnapalong & Haldiapalong

Name of Community/Local Area: West Ratna & Rumkha Bazar

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):

The Sub-Project is categorized as a village road and improvement with Bituminous Carpeting (BC) options. For drainage of rain water Construction of **02 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 254.0m & Ch. 350.0m of chainage and due to the low land in different chainage for protection work of the road construction of **35.0m Palisading work** at different Chainage, **Earth** works, **Road safety** works and **Environmental Mitigation and Enhancement** works has been included in the estimation.

Estimated footprint / land area for this sub-project is 1,822.8 sqm.

Brief description of sub-project site: (e.g. present land use, Important Environmental Features (IEFs) near site, etc.:

This proposed Rumka-Rumka bazar Road belongs to West Ratna village at Ratnapalong union, Ward-9 and Rumkha Bazar village area at Haldiapalong union, Ward-9 under Ukhiya Upazila. This road has started from Courtbazar-Marinedrive road stretching 372 meters from East side to West side, along with settlements, boundary wall, shops, trees, electric pole, mosques, NGO offices, ditches, khals homestead gardens etc.

Overall Comments

The proposed component of the sub-project (Road improvement) is not located within any remarkable environmentally sensitive area and will not cause any severe affect to the environmental settings of the area, thus not going to create intimidation to important environmental features. No drainage congestion/water loggings have been observed in the road area. No agricultural productive soil will be used for the purpose. Earth will be compacted for stabilization. The inputs will be mainly at construction phase and limited within project boundary. Moreover, mitigation measures will be taken according to the ESMP for minimizing the air, dust and noise pollution.

It has been revealed that this project's scopes of works do not intend to overtake their area of lodgment and funding entity has no intention to do so. Moreover, other issue has also been brought to their attention that drainage system and a bridge have also been included into the evaluation of this project since runoff from higher grounds are also a concerning matter during rainy season.

People of the subproject area are very much optimistic about the success of the project and are also eager to participate in the project activities. The subproject is environmentally sustainable and socially acceptable. The local community attended in the participatory public consultation meeting. Their community representatives as teachers, shop owners, farmers and elders have no objection to the construction this infrastructure in the proposed site; the community also appreciated the initiative of LGED to ensure safe access and better portability. The public consultation meeting results confirmed that improvement of this road will increase socio-economic interest in the communities and make lives easier for these people. They also requested to construct the road in accessible width so that small auto and motor vehicles can pass easily. Water flow from undulated terrains is a factor that should be considered for construction because 1 week worth of rain invites water flow which makes this surrounding area logged in several places. On another matter, locals requested to involve the local community to construction works and material storage monitoring duties.

The road is not located within any identified environmentally sensitive area, and therefore, does not seem to cause any adverse impact on the important environmental features. No significant impact is expected on the ecosystem and biodiversity, no agricultural land/ activities or fish farming will be disturbed, due to the construction of the sub projects.

Types of waste to be generated during construction and operation phase:

During construction period solid waste will be generated due to construction activities. The types of wastes are brick pit, unused sand, wood, gravels, bitumen etc. The types of wastes are gravel, stones, rock, wood, copper wires, concrete, iron, plastic etc. Negligible amount of plastic will come as residue. Moreover, liquid waste will include chemicals of bitumen leftovers, motor oils, used oil, Degreasing solvents etc. Human wastes and kitchen wastes will be generated from labor camps as well.

Sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site including elephant migration routes and remaining forests:

Within the influence area of the subproject no historical sites were identified. This sub-project is situated within West Ratna village at Ratnapalong union, Ward-9 and Rumkha Bazar village area at Haldiapalong union, Ward-9 of Ukhiya Upazila, Cox's Bazar. Some sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site are at north side Sree Hori & Dhan Mondir (5m), Fokirer dorga (200m), ATM Jafor Alom diabetics Hospital (1km), Chowdhurypara cremation (500m), Chowdhurypara graveyard (550m), at south side Rumkha bazar Salamia Hafizia jame mosque (5m), Rumkha bazar (8m), West Ratna GPS (500m), Reju khal (600m), Palong Public School (100m), at east side Courtbazar (400m), Courtbazar jame mosque (500m) and west side Rumkha bazar Panjegana jame mosque (12m), Rumkha Moni Market (300m). Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists.

Some human settlements and homestead garden are found around the sub-project area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). Elephant migration routes were about 3-4 km away from this sub-project. No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below:

Section A: Sub-Project Overview

Description of sub-project/component interventions:
The Sub-Project is categorized as a village road. Based on field survey, this sub-project involves of Herring Bone Bond (HBB). According to the design this sub-project will be developed with Bituminous Carpeting (BC) from Ch. 00 to Ch. 372m.

Subproject interventions:

- **Bituminous Carpeting (BC)** options.
- **02 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 254.0m & Ch. 350.0m of chainage
- **35.0m Palisading work** at different Chainage
- **Earth** works
- **Road safety** works and
- **Environmental Mitigation and Enhancement** works (description of such items can be found in BOQ)

Sub-project Location:

Important Features	
ID	422945005
District	Cox's Bazar
Upazila	Ukhiya
Union	Ratnapalong & Haldiapalong
WARD	9 & 9
Total Chainage	372m

Proposed Chainage	372m
Road Type	Village Road
Proposed Intervention Type	Bituminous Carpeting (BC)
Road Starting Point Coordinates	Latitude: 21^{0}16'31.0" N Longitude: 92^{0}06'00" E
Road Ending Point Coordinates	Latitude: 21^{0}16'35.0" N Longitude: 92^{0}05'53.0" E

Land ownership

Land is owned by Government.

Expected construction period: 1 year

Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water bodies, etc. and historical or socio cultural assets): Please also explain any analysis on alternative location was conducted:

Some existing interventions within the sub-project location at north side Sree Hori & Dhan Mondir (5m), Fokirer dorga (200m), ATM Jafor Alom diabetics Hospital (1km), Chowdhurypara cremation (500m), Chowdhurypara graveyard (550m), at south side Rumkha bazar Salamia Hafizia jame mosque (5m), Rumkha bazar (8m), West Ratna GPS (500m), Reju khal (600m), Palong Public School (100m), at east side Courtbazar (400m), Courtbazar jame mosque (500m) and west side Rumkha bazar Panjegana jame mosque (12m), Rumkha Moni Market (300m).

Within the influence area of the subproject no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (checked with local IUCN representative).

Section B: Environmental Screening

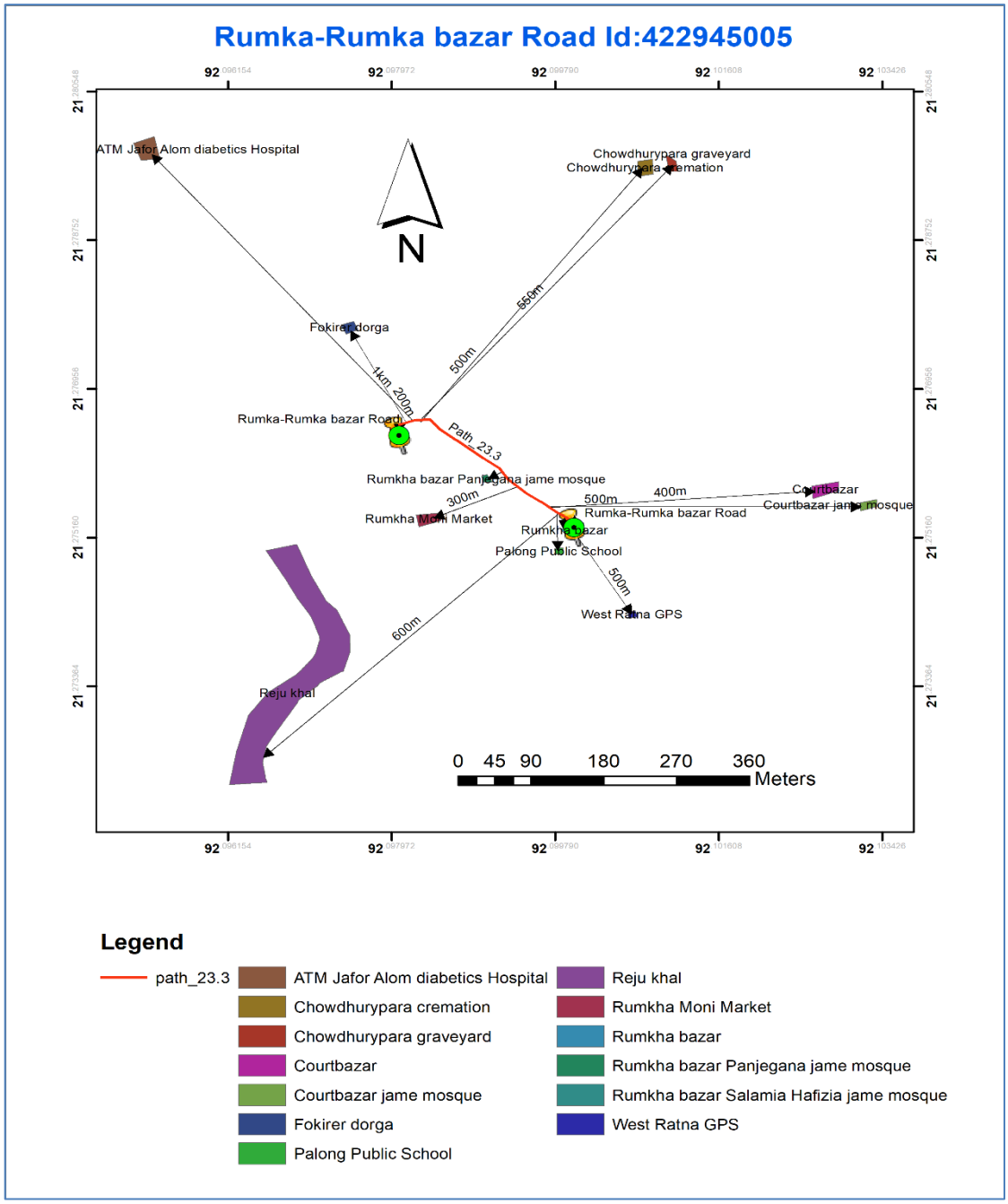
***B.1*: Environmental feature of sub-project location**

Description of cultural properties (if applicable, including distance from site): Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests:

Sensitive environmental, cultural, archaeological, religious sites within 1 kilometer of site including at north side Sree Hori & Dhan Mondir (5m), Fokirer dorga (200m), ATM Jafor Alom diabetics Hospital (1km), Chowdhurypara cremation (500m), Chowdhurypara graveyard (550m), at south side Rumkha bazar Salamia Hafizia jame mosque (5m), Rumkha bazar (8m), West Ratna GPS (500m), Reju khal (600m), Palong Public School (100m), at east side Courtbazar (400m), Courtbazar jame mosque (500m) and west side Rumkha bazar Panjegana jame mosque (12m), Rumkha Moni Market (300m).

Apart from this structure no other sensitive environmental, cultural, archaeological, religious sites exists.

A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas are shown below.



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive areas found in the areas, except some matured vegetation around the site. Several mosques, school and human settlement were found during the survey. It will not be affected by the construction works, as the activities will be carried out within the existing subproject boundary and necessary preventive and mitigation measures will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*

No. There is no existence of Elephant corridor/ route now, which have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) Potential impacts on remaining forests in/around camps Yes/No

N/A (This activity will be confined within the existing subproject area)

(3) Other issues:
No more mentionable issues rose.

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:
Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of vehicle-related pollutants 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/ preventable by mitigation measures.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, tractor, trailer, etc. move on roads adjacent to sub-project throughout the day and night generate noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation):

Landslide potential is low. There is low possibility of soil erosion or landslide during construction period of targeted sub-project. The impacts are negative but very small scale, site-specific within a relatively small area and adjustable by mitigation measures.

Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH):

Groundwater is the main source of potable water in the Sub-project area. The shallow depth is

about 60 feet to 70 feet and deep tube well depth is 700 to 800 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 600-800ft (Field survey, 2019). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer. Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)
Status of wildlife movement: N/A (None of the information was found about the wildlife movement in or across the area)
State of forestation: Patches of vegetation containing large and matured trees across the road side of the proposed subproject area are located within 200m radial distance.
Summary of water balance analysis (For water supply scheme only): N/A

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g. status of access road or any other facility required for sub-project to be viable): A BC road called Courtbazar-marinedrive connecting road is available for access. It is possible to carry the construction materials on this road to the construction site with limited traffic flow since this road has small corridor to pass large vehicles.
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction: Toilet and water supply facilities will be ensured by the contractor in the vicinity of the construction area for all the components of the sub-project, electric connection will be established with the accommodation facility due for the workforce. Electricity is available in the area.
Possible location of labor camps: Labor camp can be established along the road since there are available open private lands. One possible location will be Rumkha bazar. However, this will have to be done with the consent of land owner under a mutual agreement, with the supervision of the Engineer in charge.
Requirement and type of raw materials (e.g. sand, stone, wood, etc.): i) Bricks ii) Sand iii) cement iv) Gravel v) water vi) Aggregates vi) steels vii) Bitumen are the most common type of road materials used in construction.
Identification of access road for transportation (Yes/No):

Yes. A BC road called Courtbazar-marinedrive connecting road is available for access.
Location identification for raw material storage: Adjacent to labor camp or different location is available. However this will need placement on open fields and should be consulted with local committee. Material storage area must be well fenced and materials will be covered with tarpaulins.
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.): Earth/ mud, plastics, brick chips, dust from bricks during construction of project components will be produce. Also sludge will be produced from labor camp latrines and kitchen waste mostly composing of organic matters as fiber, starch, carbohydrates and proteins. 10% of the kitchen waste may be classified as plastics or non-biodegradables. Solid waste may amount to 20 kg daily and sludge may amount to 5 kg per day.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g. Solids wastes, liquid wastes, etc.): **Solid waste:** Residual waste from the labor camps will be generated. Equipment maintenance/vehicles on-site and scrap material will occur during construction works which are mostly solid waste. Leftover oils or spills from machinery can be a high probability generating liquid waste. Waste from civil works. And the quantity will be tentatively 150 kg. **Liquid waste**: During construction period fecal sludge will be generated from the labor camp and the quantity would be nearly 6 kg per day, which would be reduced in weight in course of time. Leftover oils or spills from machinery can be a high probability generating liquid waste.
Type and quantity of raw materials used (wood, bricks, cement, water, etc.): **Type:** i) Bricks, ii) Sand iii) cement iv) aggregates v) water vi) concretes vii) Bitumen are the most common type of road materials used in construction. **Quantity**: It is difficult to give exact figures of construction waste produced on a typical construction site.
Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards: No such vegetation is present in the right of way. Specific soil amount is not needed for the project. The current condition explains that there is no aggregated soil on the right of way.
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation)

The possibility is Medium, for stagnant water bodies to occur. Because water usage will be higher during the construction period. By default, this area has no water logging troubles due to being natural channels. Moreover, no possibilities of stagnation of water in long run. So, local communities have stated that they do not have severe troubles with mosquitos or other disease vectors.
Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) Vorakhali Khal and Katakhali khal are near about the sub project location, but not to disturbance or modification of existing drainage channel during construction phase.
Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. Because under this interventions, there is very little scope of damage to terrestrial or aquatic ecosystems or endangered species.
Activities that can lead to landslides, slumps, slips and other mass movements in road cuts: Scope of work leading to low scale effects of landslide. The impacts are negative but short-term and site-specific. It can be managed through mitigation measures.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description) Low, since both sides of the road is more or less similar elevation. The concentrated outflow will be managed since the sub-project has included drains.
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: No
Chance of long-term or semi-permanent destruction of soils: (High/Medium/Low with description) No
Possibility of odor and water, soil quality impacts from SWM and FSM disposal system:(High/Medium/Low with description)

No
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) There is no possibility of stagnant water bodies remained for encouraging mosquito breeding and other disease vectors, during the operation phase.
Likely direct and indirect impacts on economic development in the project areas by the sub-project: Construction or implementation of a road project substantially contributes to the development of the project areas. It surely improves the communication network, reduces the transport time, increases the trade and business in/around the areas, and ensures access to better living conditions with amenities, better educational and job opportunities and health facilities. Thus, the direct and indirect impacts on economic development in the project areas would be enormous by this sub-project.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No existing drainage channels or surface water bodies found in the project area, therefore, no such effect can be anticipated
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. There are no protected areas in or around project sites, and no known areas of ecological interest.
Activities leading to landslides, slumps, slips and other mass movements in road cuts: The entire sub-project component area is nearly flat, thus no such type of impacts is anticipated.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) No
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: Improved communication will definitely increase the traffic/ vehicular movement, which must increase the light and noise pollution, but air pollution effect will not be increased significantly, as the proposed BC road will reduce the pollution generated from dust on the muddy road, especially during the dry season and if the vehicles are maintained in good conditions

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

Section D: Environmental Screening Summary of the Work Package-23.3

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
1: Sub-Project Interventions	**Air quality**	Under the subproject intervention the overall score is **low**.	• Limiting earthworks; • Watering of dry exposed surfaces and stockpiles of aggregates at least twice daily, as necessary; • Requiring trucks delivering aggregates or bricks and cement to have tarpaulin cover and Limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Covering of trucks; • Records of air quality inspection;	Visual monitoring of air quality and if requires, air quality test (CO, $PM_{2.5,10}$) once in construction period in winter season.
	Soil impacts	Under the sub-project intervention the overall score is **low.**	• Precautions might be taken when rainstorms are likely, when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms. • The earthwork sites where exposed land surface is vulnerable to runoff shall be consolidated and/or covered. • The material stockpile sites shall be far away from surface water bodies and areas prone to surface run-off. Loose materials shall be bagged and covered. • Channels, earth bunds, netting, tarpaulin and or sand bag barriers	Construction Contractor monitored by Consultant and PIU	• No visible degradation to nearby drainages, • *khals* or water bodies due to soil erosion. • Rain storms in construction phase.	Monitoring as weekly basis.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
			shall be used on site to manage surface water runoff and minimize erosion. • The overall slope of the work areas and construction yards shall be kept to a minimum to reduce the erosive potential of surface water flows elsewhere.			
	Hydrology (surface and groundwater)	Under the subproject intervention the overall score is **low**.	• All precautions to store chemicals/oil/fuel properly so that no chance of spill. • Workers must specify waste dump locations to avoid littering which in turn might negatively affect surface and ground water. • Monitor water quality according to the environmental management plan.	Construction Contractor and monitored by Consultant and PIU	• Areas for stockpiles, storage of fuels and lubricants and waste materials; • Records of water quality inspection; Water Quality Test • (National Drinking Water Quality Standard Parameters)if requires; • No visible degradation to nearby drainages, *khals* or water bodies due to	Water quality test (mainly GW) twice during the construction period in six months interval.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
					construction activities. • Records should be kept and logged.	
2: Pre-construction Phase	**Sanitation, water supply**	Under the subproject intervention the overall score is **low**.	• Provide suitable housing, adequate supplies of potable water, and toilet and bathing facilities within labor camp area for the assigned laborer. • Provide means for disposing of wastewater from toilets, baths and food preparation areas either through a septic tank and soak away, or holding tank with removal by vacuum truck. • Records for any type of training or awareness building sessions must be kept at site.	Construction Contractor and monitored by Consultant and PIU	• Site-specific H&S Plan; • Records of supply of uncontaminated water; • Record of Health &Safety orientation trainings; • Condition of sanitation facilities for workers	Visual inspection by PIU and supervision consultants on monthly basis
	Transportation	Under the subproject intervention the overall score is **low.**	• Contractor should verify vehicles for the suitability of carrying, loading and unloading of materials	Construction Contractor and monitored by Consultant and PIU	• Record of regular inspection. • Record of accidents/incidents	Monthly monitoring.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
	Storage of construction materials	Under the subproject intervention the overall score is **low**.	• Orienting concerned person and team assigned for the construction work.	Construction Contractor and monitored by Consultant and PIU	• List of materials and sources of materials;	During implementation phase, as necessary with discussion with PIU, Consultant
3: Construction Phase	**Wastes**	Under the sub-project intervention the overall score is **low.**	• Prepare and implement on-site waste water runoff and labor camp waste management plan approved by PIU and consultants. • Wastes must be placed in the designated bins which must be regularly emptied. These shall remain within demarcated areas and shall be designed to prevent wastes from being blown out by wind. • All waste must be removed from the site and transported to a disposal site.	Construction Contractor and monitored by Consultant and PIU	• Complaints from community; • Regular inspection of waste management activity; • Waste disposal record.	As work weekly progresses
	Cut and fill Activities (Cutting of hill slope and earth removal from borrow areas caused for soil erosion and	Under the sub-project intervention, the overall score is low.	• During construction cut and fill will be balanced as far as is possible. Designs shall ensure that as far as possible all cut and fill activities are balanced • Proper care will be taken during cutting and filling so that slope or toe of the road embankment	Contractor, environmental specialist of D&SC	• Location of road alignment and slope.	Daily as work progresses

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
	landslides)		remain within the right of way and does not disturb the crop.			
	Storage of materials	Protected and safety storage to be needed for construction materials storage. Not interrupt natural land contours, disturbance in natural drainage patterns and logging of water and the overall score is **low.**	• With the assistance from site management committee in Camp to identify the storage site and other requirements, which will be approved by PIU and consultants.	Construction Contractor and monitored by Consultant and PIU	• List of materials and sources of materials; • Storage areas for materials and equipment.	Monthly basis during implementation phase, as necessary with discussion with PIU, Consultant
	Removal of Vegetation (May cause soil erosion and their deposition on nearby crop field, affecting soil quality and productivity)	Under the sub-project intervention, the overall score is **low.**	• If during detailed design cutting of trees is required, compensatory plantation for trees lost at a rate of 5 trees for every tree cut. • Prevent workers or any other person from removing and damaging any flora (plant/vegetation) and fauna.	Contractor, environmental specialist of D&SC	• Complaints from community;	Daily

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
	Noise pollution	Under the subproject intervention the overall score is **low.**	• Consultation with affected people; not to operate noisy equipment during working period; • No noisy work after 5.00 pm. • Sound suppression for equipment; • Ear protection for workers. • Conduct noise quality monitoring as per EMP.	Construction Contractor and monitored by Consultant and PIU	• Number of complaints from stakeholders; • Use of silencers in noise-producing equipment and sound barriers; • Noise Level following decibel meter (dB)	Inspection by PIU and supervision consultants on monthly basis;
	Air pollution	Under the subproject intervention the overall score is **low.**	• Water spraying for dust control; construction materials with potential for significant dust generation shall be covered; no smoke emitting equipment; and limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor and monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Records of air quality inspection.	Visual observation and monitoring of air quality during construction period.
	Road Safety and Accidents	Under the subproject intervention the overall score is **low.**	• Erection of suitable signage at construction sites • Direct observation and discussion with local people • Restrict the transport of oversize loads. • Operate construction vehicles to non-peak periods (night) to minimize the traffic disruption. • Enforce on-site and access road speed limits.	Construction Contractor, environmental specialist of D&Sc.	• Complaints from communities, pedestrians	Day basis during work time

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
			• The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc. • Local residents should be kept informed about planned Works			
4. Post Construction	**Road Safety**	Under the issue the overall score is **low**.	• Install traffic signs for speed limit, speed breaker where needed, Mile post and create adequate ***traffic*** detours, and sufficient ***signage*** & ***warning*** signs, Post speed limits and suitable bending on the road. • The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc.	Construction Contractor, environmental specialist of D&Sc	• Road signage and safety instruments at suitable locations and chainage	Immediately after the construction work is over.
	Tree re plantation	Under the issue the overall score is **low**.	• Replantation of trees during monsoon period • Maintain of trees properly • Check survival of trees and replant the dead trees	Construction Contractor, environmental specialist of D&Sc	• Number of complaints from stakeholders; • Records of trees number and tree plantation inspection;	Immediately after the construction work is over.
5.	**Maintenance**	Under the issue	• No advertisement/boardings shall	LGED	• Number of	During Operation

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
Operational Phase	**of road and assets** (Road accidents may increase due to higher number of vehicles using the roads at increased speeds)	the overall score is **low**.	be allowed within the Right of Way limits of the project road. • Regular maintenance and cleaning of assets such as sign boards, road safety sign etc. shall be undertaken. • Clear smooth speed breaker/rough surfaces should be clear in views. • Regular maintenance of road surface and shoulders.		complaints from stakeholders;	under LGED's regular maintenance program in each 3 years.

* Overall Impact Score: High = Likely to cause long-term E&S impacts; Medium = Likely to cause temporary impacts; Low = Likely to cause little, short-term impacts

**Post-construction phase denotes the time period contractor use to clear and clean up the sites after the construction work is ended, perform tree plantation, grass turfing, and minor rectification till the official handing over the site to LGED, or owner of the site.

Recommendation for further environmental and social assessment and/or site specific environmental and social management plan: Yes

**If yes, please specify what assessments/plans would be required.* Mention some recommendation on E&S assessment …. ESMP

If site specific environmental and social management plan (ESMP) is followed the impacts can be mitigated and monitored. ESMP is attached.

Appendix-2: Environmental and Social Management Plan (ESMP)

ESMP for Access and evacuation Roads; *(LGED/EMCRP-W23.3):* Rumka-Rumka bazar Road Id:422945005

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
Pre-Construction Stage	Loss of land / and other physical assets	• No land acquisition is allowed within this sub-project activities So, there are no any mitigation measures according to this impact.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of livelihood	• Under this subproject, there is no scope of negative impact of adjacent livelihoods	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Stakeholders Engagement	• All of the project stakeholders should be consulted • Separate community level consultation meeting with the potential affected HHs • Consultation meeting with host communities about the project objectives and scope of works	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of right to access	• Project to ensure thorough analysis of alternatives that access enjoyed by the community remains intact. • In case of unavoidable circumstances, alternative access will be provided.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Site Selection & implementing interventions: Human-elephant conflict	• Selection of sub-project sites and all implementing interventions must take place outside of the elephant corridor/influence area.	PIU	Environmental Consultant of PIU, PSC
Pre-Construction Stage	Site Preparation: Soil Erosion; Alteration of natural drainage	• Our selected sites avoided the low land near the water bodies or natural flow path to avoid the flash flood or any kind or surface runoff.	PIU & Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Tubewell location within the construction site is not near to any kinds of latrine and soaks well which could be contaminated by those. • After completing the development we restored the place as like before to avoid the cut and fill operational problems. • This site is in the local community, so we discussed with the local community to avoid any conflicts related local habitation, culture. • Sub project intervention mustavoid of natural disturbance of existing slop and natural drainage. • The contractor ensuring sound environment for the local residents near the sub project site.		
Construction Activity	Noise from construction works	• Construction activities mostly will finish at day time within 05 PM, and must confirm proper measures for avoiding any disturbance. • All Personal Protective Equipments (PPEs) must be ensured in sites before starting any kinds of construction works.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Dust	• Acceptable range of emission of CO, particulate matter [SPM (**Suspended particulate matter)**, PM2.5, 10] and Hydrocarbons must be maintained through good construction work practices • Dust generation must be limited as a result of clearing, leveling and site grading operations with	Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		using water florescent manually and through water pipes. • Dust generation due to vehicle movement on connecting road shall be controlled by watering the path at limited level		
Construction Activity	Safety Issues	• Unauthorized entry is completely prohibited in our site and take necessary measures for preventing this problem • Before works started Contractor must provide proper training and guidelines on health and safety issues to the labors and associated staffs. • Records of every training must be kept at site. • All kinds of Child labour are completely prohibited in every site. • Every construction materials storage site will be well fenced by Tin and safety caution tape.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Traffic Management	• Contractors will maintain proper route for traffic management which is to beconsulted with and confirmed by the Executive Engineer of Cox's Bazar.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Conflicts with existing users due to the scarcity of resource base.	• A detailed assessment of the available resources and consent of the local representative for withdrawal of water from existing surface water sources shall be taken. • If ground water is withdrawn, adequate approvals from the appropriate department need to be undertaken before setting up bore wells.	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Any type of consent letter or agreement for withdrawing water from either surface or underground sources will be kept on site. • Local community must be consulted before any construction works starts.		
Construction Activity	Increase in road accidents	• Maintain safety measures during the movement of heavy machinery and equipment. • Local community will be trained up on traffic management and awareness.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Labour Base Camp: Conflicts with the local residents	• Awareness building session will be undertaken about prevention of child abuse, child marriage, GBV, sexual harassment, trafficking of women and children as well as illegal drug trade. Written records of this awareness building session shall be kept on site. • Work force should be prohibited from disturbing the flora, fauna including hunting of animals, wildlife hunting, poaching and tree felling. • Adequate facilities ensuring sanitation for labour camps will be put in place • Treated water will be made available at site for drinking purpose. • Adequate accommodation arrangements for labour forces. • Labor code of conduct is to be disclosed through consultation.	Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Construction Activity	Waste Management: Improper	Preparation of a waste management plan covering the	Contractor	Environmental

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
	management and handling of hazardous and non-hazardous waste during construction.	following aspects: • Residual waste from the temporary accommodation facilities for labor Waste and from equipment maintenance/vehicles on-site • After completion of construction works. So, recycling process is not applicable. • Proper consents for hazardous waste management.		Consultant of PIU, PSC
Construction Activity	Health & Safety Risks: • The potential for exposure to safety events such as tripping, working at height activities, fire from hot works, smoking, failure in electrical installation, mobile plant and vehicles, and electrical shocks. • Exposure to health events during construction activities such as manual handling and musculoskeletal disorders, hand-arm vibration, temporary or permanent hearing loss, heat stress, and dermatitis.	• All construction equipment will be properly inspected timely. • The risk assessment will be prepared and communicated prior to the commencement of work for all types of work activities on site. • Preparation of proper walkways and clearly designation as a walkway has to be ensured; all walkways shall be provided with good conditions underfoot; signposted and with adequate lighting. • Proper Signpost at any slippery areas will be ensured in construction site. • Fire extinguishers will be located at identified fire points around the site. The extinguishers must be appropriate to the nature of the potential fire. • This sub project has Proper communicative emergency response plan (ERP) with all parties, the ERP to consider such things as specific foreseeable emergency situations, organizational roles and authorities' responsibilities and expertise, emergency response	PIU & Contractor	Environmental Consultant as well as Social Development and Gender Specialists of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		and evacuation procedure and personnel will be trained and drilled to test and ensure the coherence with the plan. • All people of construction site will be concerned about the safety and maintenance of Electrical equipment; works will be carried out on live systems. • Provision to first aid box in sub-project areas will be ensured. • Proper Emergency evacuation response plan will exist in sub-project area. • All safety equipment will be available in sub-project site (safety, size, power, efficiency, ergonomics, cost, user acceptability etc.), the lowest vibration tools will be provided that are suitable and can do the works. • Awareness training will be given to all personnel involved during the construction phase in order to highlight the heat related illnesses of working in hot conditions such as heat cramps, heat exhaustion, heat stroke, and dehydration. Written records of this awareness training shall be kept on site. • Adequate quantities of drinking water will be available at all Sites, on different locations within the site. • Provision to maintain proper PPE wherever necessary and to ensure that there are satisfactory washing and changing facilities. • Provision to ensure all workers exposed to a risk are		

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		aware of the possible dangers and also given thorough training on how to protect themselves and there should be effective supervision to ensure that the correct methods are being used.		
Operation &Maintenance	Noise disturbances to fauna	• Provision to maintain noise and vibration from the operation and maintenance of machinery and equipment by proper monitoring and measures. • Provision to take necessary lighting, caution for the works and necessary maintenance should be done in day light.	PIU	Environmental Consultant of PIU, PSC. Union Member
Construction activity	Odours and pollution caused by leaking latrines and faecal sludge, and solid wastes impacting surrounding water bodies, flora and fauna	• Preventative maintenance schedule should be followed. • Solid organic wastes should be stored in bins and/ or skips and emptied regularly at a designated waste disposal area away from the camp site. If no designated site is available within the reach, a dug-hole at a nearby place can be used with periodic filling with soil layer for preventing pollution and generating nutrient rich compost soil over time.	PIU	Environmental Consultant of PIU, PSC. Union Member
Decommissioning during the project implementation period (including site clearance after the construction)	The impacts are similar to those listed in construction stage: • Pollution from waste materials • Health & Safety risks to workers and local community	• Contractor must prepare a demolition and waste management plan including following directive aspects given hereunder.	PIU / Contractor	Environmental Consultant of PIU, and Executive Engineer of Cox's Bazar

Waste Management Plan:

The Contractor shall develop a waste management plan for various specific waste streams (e.g., reusable waste, flammable waste, construction debris, food and organic waste etc.) prior to commencing of construction and submit to LGED for approval. The plans must include following principles or series of actions, which will be carried out/followed by the contractor and supervised by the Field level Environmental Specialist and Social Development Specialist.

For wastes:

- The quantity of waste materials shall be minimized by 3R (Reduce, Recycle and Reuse) approach, and wastes shall be segregated accordingly, wherever practical; and stored in designated places/facilities in the site.
- Construction site shall be maintained in a cleaner, tidy and safe condition and appropriate facilities shall be provided and maintained as temporary storage of all wastes before transportation and final disposal.
- Hazardous waste viz. waste oil etc. will be collected and stored in a paved and bounded area and subsequently sold to authorized recyclers.
- The scrap material generated from related construction activities will be collected and stored separately in the stack yard and sold to local recyclers.
- All wastes generated during construction shall be disposed off in an environmentally acceptable manner. This will include consideration of the nature and location of disposal site, so as to cause less environmental impact.
- Other leftover non-hazardous wastes, including construction debris shall be transported to an approved disposal site by pick up tracks or back loaded vehicles with proper care.
- Organic wastes produced in the camp site during the construction period shall be collected and transported in vehicles covered with tarps or nets to prevent spilling waste along the route to the designated disposal site;
- Burning of any type of wastes in the construction site shall be prohibited completely.

Prepared by: Harogopal Kabiraj, Environmental Focal Person, +8801714980171

Tanvir Ahsan Haque, Environmental Specialist, +8801688117059

Ms. Sadia Azad, Disaster and Climate Change Specialist, PIU.

Reviewed by: Md. Saiful Islam, Field Level Environmental Specialist, +8801913442006

Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.3

In consideration to the above-mentioned environmental impacts and their mitigation measures for all sub-projects, individual BOQ for each component has been prepared. Following tables will illustrate such items of enhancement and impact mitigation works as well as considering the emerged situation of COVID-19, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites.

Cost of Environmental Enhancement Works for W23-3 in BOQ

Sl no.	Description of item	Quantity	Unit price	Total amount
1.	**Grass Turfing** Turfing on embankment top and slope & any critical place with good quality turf supplied by the contractor of not less than 225mm square in dimension including placing and watering till grass is fully grown, etc. all complete as per direction of E.I.C. (Payment to be made only when grass is fully grown)	1075.30 Sq.m	@38.15 Tk. Per sqm	41,022.70
2.	**Dust suppression measures** Dust suppression measures like water sprinkling on aggregates/unpaved roads, in and around the work site and as per direction of E-I-C	472.0m	@ 2.56 BDT	1,208.32
3.	**Water Supply and Sanitation** Providing and maintaining adequate portable water supply, sanitation, cleanliness facilities at camp site and work site to the entire satisfaction of Engineer-in-charge. **Temporary Toilet:** Construction of temporary toilets in work site/ rest area complete as per design and specifications and approved by the Engineer-in-Charge. There should be 1 camp in each site. In each camp, there should be 1 no of toilet for women and 1 no of toilet for	2 nos.	@12822.86 per toilet	25,645.72

Sl no.	Description of item	Quantity	Unit price	Total amount
	men.			
4.	**First Aid Box** Supplying, equipping and maintaining adequate first-aid box throughout the working period at worksite and site office, and erect conspicuous notice boards directing where these are situated and providing all requisite emergency medical first aid kits, including complying with the government medical or labour requirements at all times, and provide, equip and maintain necessary dressing kits throughout the working period for attending minor injuries, etc. all complete as per requirement and full satisfaction of Engineer-in-charge.	1 no.	LS @5000 Tk. Per box	5,000
5.	**Drinking Water Facilities** Providing continuous adequate drinking water supply at worksite and site office as well by installing necessary tube-well/s where applicable or any other means depending on local situation, also providing essential arrangement for storing drinking water by supplying portable best quality water tank equivalent to Gazi/Padma of adequate capacity depending on the number of users, including supplying 1 (one) no. best quality water filter of minimum capacity 30 liters with necessary kits, etc. all complete as per satisfaction and direction of the Engineer-in-charge.	2 no.	LS @ Tk. 30,000	60,000
6.	**Traffic Management** Maintaining traffic management at worksite from time of commencement of contractor's activities to time of completion activities, including ensuring that the road is safe for users, providing a safe working area for those involved in work on trafficked network and minimizing any disruption to smooth flow of traffic (this includes providing necessary barricades, warning signs/lights, guide signs, flagmen, maintaining diversion roads by	1 no.	LS @ Tk. 15,000	15,000

Sl no.	Description of item	Quantity	Unit price	Total amount
	cutting, filling, constructing, etc. or by any other means) in accordance with the full satisfaction of the Engineering-in-charge.			
7.	**Personal Protection Equipment for Workers** Providing and maintaining appropriate (safe design, fit and comfort) personal protection equipment (PPE) to ensure the highest possible protection for employees in establishing and maintaining a safe and healthful working environment at workplace, including demonstrating, providing training on proper understanding and development of skill in the use of PPE, including supplying (i) best quality safety jacket, (ii) suitable hand protection gloves, (iii) appropriate foot protection shoes, (iv) best quality safety helmets, face shields, ear muffs etc. (v) suitable eye protection goggles	LS	LS @ Tk 30,000	30,000
8.	**Tree plantation** Tree plantation to compensate the felled down trees and enhance the ecological condition in the subproject area- preferably local fruits, flowers, medicinal and ornamental trees- Mango, Jackfruit, Jam, Kathbadam, Chalta, Krisnachura, Bokul, Jarul, Polash, Kadom, Shimul, Neem, Arjun, Amloki, Horitoki, Bohera, Mahogany, Palm Tree, Chambal, Rain Tree, Shil koroi, Satim, Sishu (including protection, fencing and conservation during project defect liability period): Preferably at both sides of Road where space is available (fencing as per LGED rate schedule 5.26.14) (Contractors will also be instructed by the consultant and PIU prior to the tree plantation work) at an interval of 10 feet.	50 nos.	@ Tk. 1000	50,000
9.	**Motivation training** Motivation training (twice: before and after construction start) of the Upazila Engineer 'sand Contractor's representatives on safety practice and as per direction of the E.I.C.	1 no.	LS @ Tk. 10,000	10,000

Sl no.	Description of item	Quantity	Unit price	Total amount
10.	**Waste disposal facility** Temporary camp site waste disposal facility improvement 2 nos. (1 no of organic waste and 1 no of inorganic waste disposal facility) and as per direction of E.I.C.	LS	@ Tk. 5000	5,000
11.	**Water Test (Drinking Water samples)** Water samples are to be collected periodically (half yearly) from the tube well at labor shed area for laboratory analysis of different parameters such as pH, arsenic, iron, chloride, hardness, total dissolved solids, nitrate, nitrite, coliform, electrical conductivity etc. all complete as per direction of E.I.C. (including the cost of actual fees for testing from reputed laboratory and report) as desired by E.I.C.	LS	@ Tk. 5000	5,000
12.	**Working labour shed:** Construction of Labor shed (Size: 30'x20') with C.I sheet Roofing, Tarza fencing and brick soling floor as per requirement and direction of the E-I-C.	1 no.	LS @ Tk. 30,000	30,000
13.	**Environmental management** Environmental management costs of the Environment & Social/ Safeguard Personnel for Environmental and Social Management and Monitoring during construction and operation phase for their salary & transport (Net payment excluding Tax &VAT). And as per direction of the E.I.C. **(One Safeguard Personnel for R3, R5, R7, R11 & R14)**	1 person	Monthly basis @Tk. 35,000.00 for 12 months. One person covering 5 roads i.e.35,000Tk.*12months*(1/5 one road).	84,000.00
	Subtotal Bill: Environmental facilities			**361,876.74**

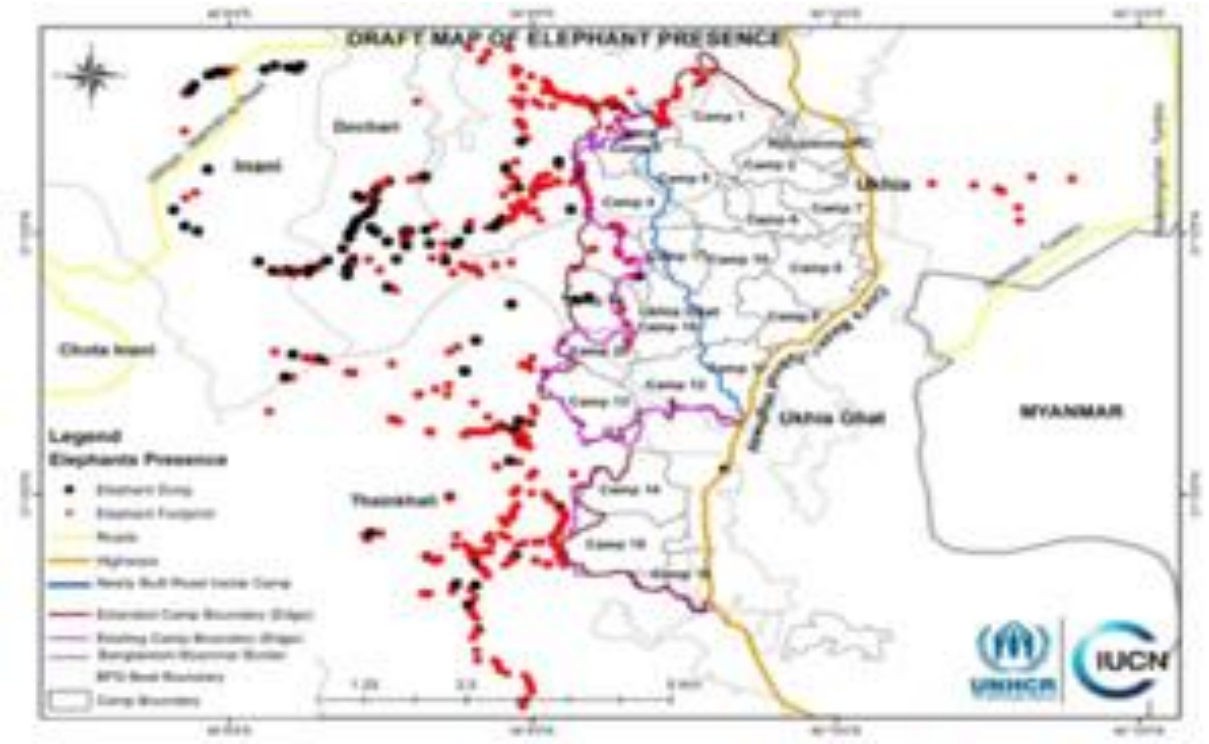
Cost of H&S Measures under COVID 19 Situations for W23-3

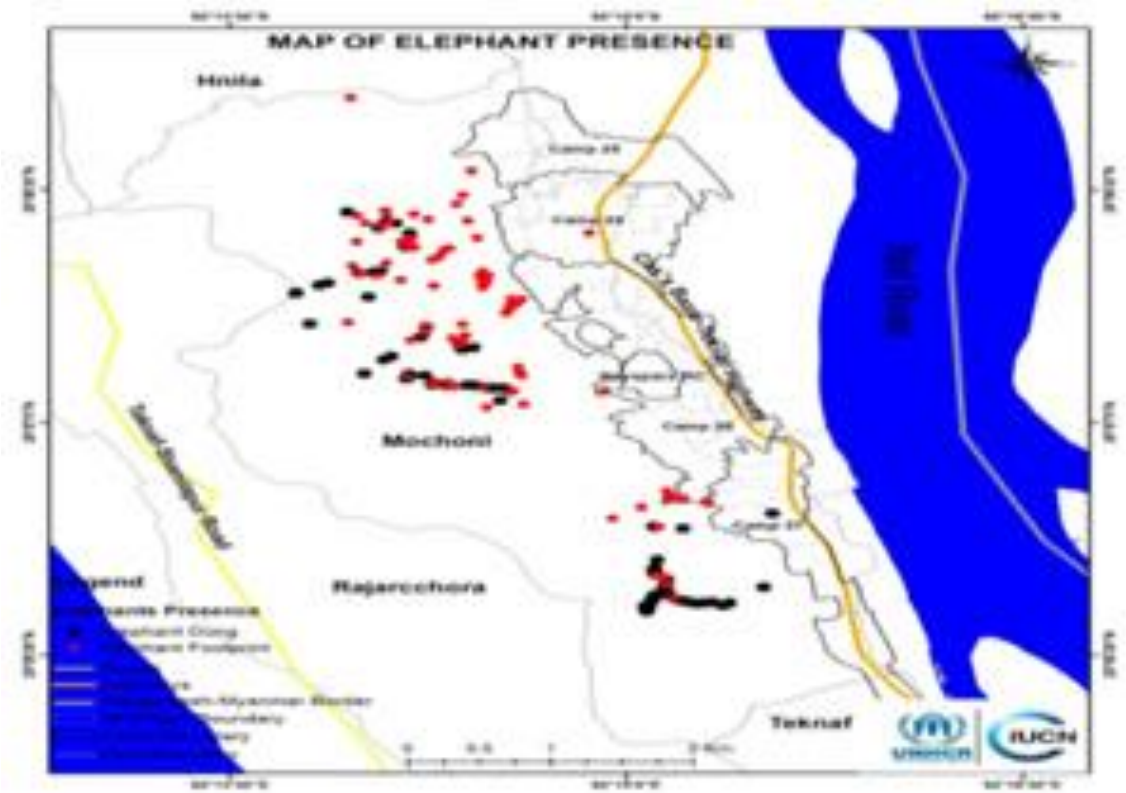
Considering the emerged situation, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites. The cost is estimated counting 10 workers for 270 active working days (9 months in a year) in a contract period for one site under this package (EMCRP/W-23.3).

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
1.	Non-Contact IR Digital Thermometer	01 nos. in each site	N/A	N/A	5,000.00	1	5,000.00	Each site office will have a thermometer for checking body temperature every morning at the entrance of the working site
2.	Wash Basin with Small Water Tank, Bucket and Mug (or piped water supply)	01 nos. in each site	N/A	01 nos. in each camp	10,000.00	2	20,000.00	Wash basin to be installed at favorable locations immediately after the entrance to the facility
3.	Trash bin (covered)/Paddle Bin	01 nos. in each site	N/A	01 nos. in each camp	550.00	2	1,100.00	
4.	Bar Soaps (150 gm each)	27		34	50.00	61	3,050.00	To be placed in a case/holder on the basin, for washing hands for max. 13 people a day and showering of 10 workers in each labor camp.
5.	Hand Sanitizer (2 nos. 250 ml bottle and 5 liter Can for Refill)	2 bottles and 1 Can for each site	N/A	N/A	4,000.00	1	4,000.00	2 bottles and a 5 litre can for each Site office
6.	Face Shield/ Protective Safety Goggles	6 nos. for each site		N/A	400.00	6	2,400.00	For labors who work in close contact, 6 in each site

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
7.	One time Mask (Disposable) for Contractors' Staffs	3 nos. each day in each site		N/A	12.00	810	9,720.00	Reusing N95/KN95 mask will not be a manageable option in field scenario, one time disposable medical/surgery mask a good option instead.
8.	Cloth mask for Workers	N/A	10 nos. for each labor camp		35.00	180	6,300.00	A worker will use a mask for 15 days with everyday washing
9.	Floor Cleaner (1 litre Can)	1 Can	N/A	1 Can	250.00	2	500.00	
10.	Detergent Cleaner	N/A	1/2 kg in each camp/month		400.00	4.5	1,800.00	To be used for washing clothes, masks and tools & equipment, etc.
11.	Miscellaneous cost				20,000.00	1	20,000.00	Contingency cost for medical emergency and compensation for workers, subject to proper documentation
	Grand Total						**73,870.00**	

Appendix-4: Elephant Migration Routes Map





Elephant presence map (latest information published by on 24 May 2018)

Appendix-5: Location Map of each Sub-project

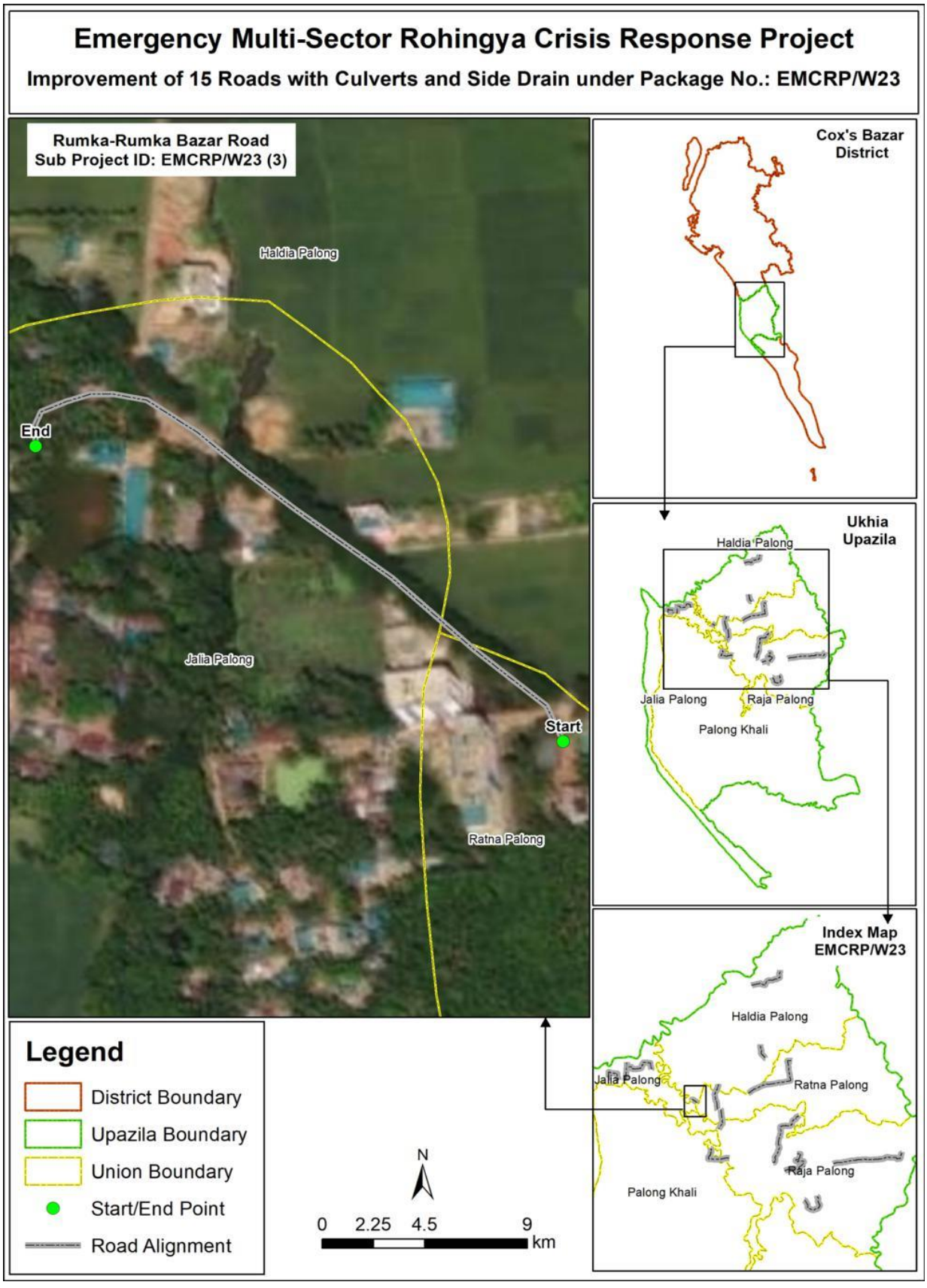
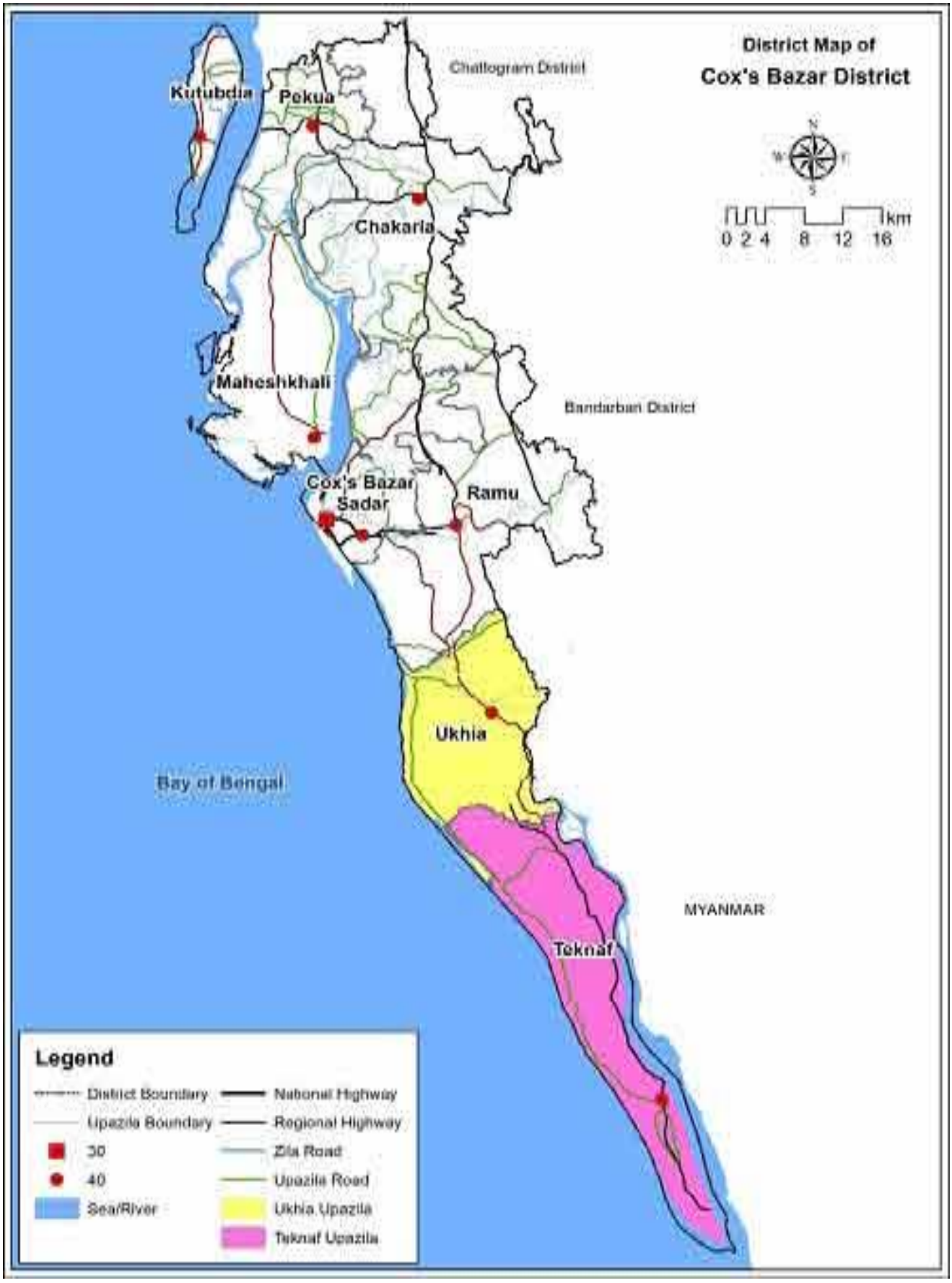
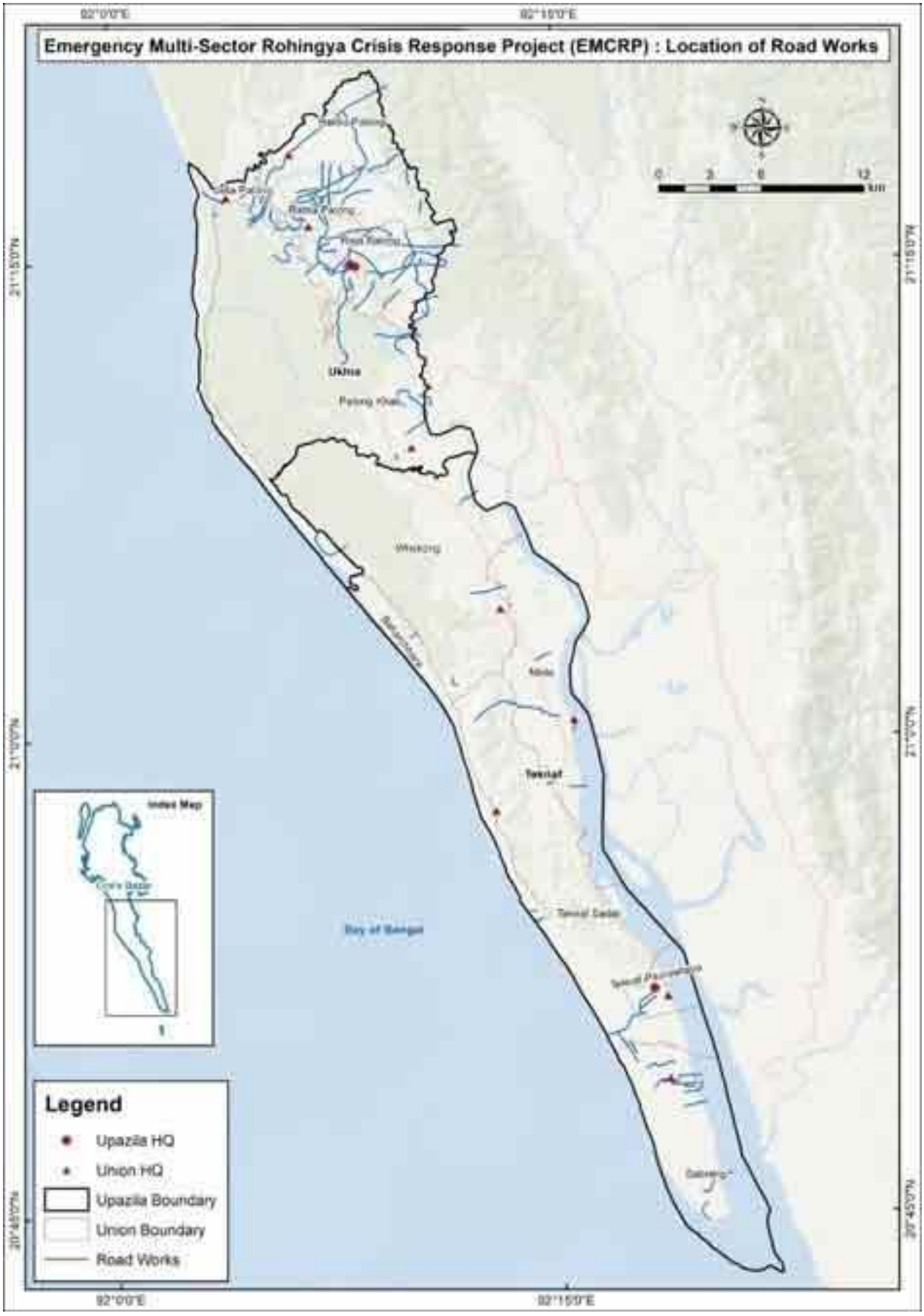


Figure: Location Map of W23-3



District map showing Ukhiya and Teknaf Upazila



Upazila map locating proposed roads

GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH
Ministry of Local Government, Rural Development and Co-operatives
Local Government Division
Local Government Engineering Department

Emergency Multi Sector Rohingya Crisis Response Project (EMCRP)

Project ID: P167762 **IDA Credit No. 5561-BD**





Environmental Screening Report

For Ukhiya - Malvita Road with culverts and side drain under Cox's Bazar District.

Under the package no. EMCRP/W23

Funded by:

THE WORLD BANK
IBRD • IDA

Government of the People's Republic of Bangladesh & World Bank

Design and Supervision Consultancy:

Development Design Consultants Ltd.

October-2020

Contents

1. INTRODUCTION 1
1.1 Project background 1
1.2 Elementary information of Work Package Components for W23.4 2
1.3 Proposed intervention items of sub-projects 5
2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS 5
2.1 Methodology 5
2.2 Important features/establishments within the PIA 6
3. ENVIRONMENTAL SCREENING 9
3.1 General 9
3.2 Major Findings 9
3.3 Climate Change Impact Screening 12
3.3.1 General Overview of the area 12
3.3.2 Site Specific Screening and outcome 13
4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) 14
4.1 General 14
4.2 Health and Safety Measure under COVID Situation 16
4.3 Cost of Environmental Enhancement Works in BOQ 17
5. LIMITATION OF THIS STUDY 17
6. CONCLUSION AND RECOMMENDATIONS 17
Annexure-01: Important Environmental Features (IEFs) near site: 19
Annexure-02: Attendance of consultation meeting 20
Annexure-03: Pictures of sub-project component location and surrounding features with public consultation 22
Appendix-1: Environmental Screening Form for examining sub-project component 23
Appendix-2: Environmental and Social Management Plan (ESMP) 41
Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.4 49
Appendix-4: Elephant Migration Routes Map 55
Appendix-5: Location Map of Sub-project component 56

ACRONYMS

BOQ	Bill of Quantities
BFS	Brick Flat Soiling
D&SC	Design and Supervision Consultant
DoE	Department of Environment
DRP	Displaced Rohingya people
EA	Environmental Assessment
EC	Electrical Conductivity
EMCRP	Emergency Multi-Sector Rohingya Crisis Response Project
ESMP	Environmental and Social Management Plan
ERP	Emergency Response Plan
ESMF	Environmental and Social Management Framework
FDMN	Forcibly Displaced Myanmar National
FGD	Focus Group Discussion
FSM	Faecal Sludge Management
GBV	Gender Based violence
GPS	Government Primary School
GRM	Grievance Redress Mechanism
HBB	Herring Bone Bond
IEFs	Important Environmental Features
ISCG	Inter Sector Coordination Group
IUCN	International Union for Conservation of Nature
IWM	Institute of Water Modeling
LGED	Local Government Engineering Department
PIA	Project Influence Area
PIU	Project Implementation Unit
PMU	Project Management Unit
PPE	Personal Protective Equipment
PSC	Project Steering Committee
SMC	School Management Committee
SPM	Suspended Particulate Matter
SWM	Solid Waste Management
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
UNHCR	The United Nations High Commissioner for Refugees
VAT	Value-Added Tax
WB	World Band

1. INTRODUCTION

1.1 Project background

An estimated 730,000[1] people of Rohingya community has fled to neighboring Cox's Bazar district of Bangladesh since August 25, 2017 to escape extreme violence in Rakhine State of Myanmar, which caused the total number of Forcibly Displaced Myanmar National (FDMN) in the district to be about 923,033[2]. This huge number of displaced population account for about one-third of the total population of Cox's bazar, a district which was already facing many development challenges and suffering from resource-constrained social service delivery system even before the crisis evolved and the mass exodus of FDMN has worsened the situation further. Almost all of these displaced people are hosted in Ukhiya and Teknaf Upazila of Cox's Bazar, in extremely congested settlements in areas having very minimal access to basic infrastructure and services and is prone to natural disasters. The Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP) has been designed in order to reduce the vulnerability of Forcibly Displaced Myanmar National (FDMN) along with people from the host communities in Teknaf and Ukhiya Upazila under Cox's Bazar District, to different disasters and improve the social service delivery system and disaster resilience to both the communities. This project will follow a sustainable development pathway that is resilient to disaster and climate change effects.

The objective of the Project is to provide greater protection for the FDMN and host communities through:

- Reducing the vulnerability to natural disasters
- Improving social service delivery system and providing better communication facility through physical interventions
- Improving water and sanitation facilities
- Reducing vulnerability to accidental fire
- Provisioning better educational facilities and
- Strengthening and scaling up of GBV prevention services to the FDMN

The project is jointly being implemented by Local Government Engineering Department (LGED), Department of Public Health Engineering (DPHE) and Ministry of Disaster Management and Relief (MoDMR) under their respective mandate and scope of works. Apart from the interventions in Addressing Gender and Social Inclusiveness and Preventing Gender Based Violence with the Support from UNFPA and building Communication and Awareness among all affected parties through an effective engagement of BCCP (Bangladesh Center for Communication Programs) in the areas, LGED is implementing a good number of infrastructural facilities, namely improvement of hat bazars, roads (both inside and outside of the camps), bridges, culverts, construction of School cum multi-purpose disaster shelters, Satellite Fire Stations, Relief Distribution Center, Community Service Center and many other different types of facilities. Given the project interventions, sensitivity of the areas and volume of people in or around the sites, the project is more likely to trigger certain Operational Policies and Bank Procedures, namely Environmental Assessment (OP/BP 4.01), Natural Habitat (OP/BP 4.04), Forest (OP/BP 4.36) and Physical Cultural Resources (OP /BP 4.11).

[1] ISCG: Situation Report Rohingya Refugee Crisis, (September 27, 2018)
[2] IOM Needs and Population Monitoring round 12 as of October 10, 2018

1.2 Elementary information of Work Package Components for W23.4

It is imperative to recognize proposed components under Work Package-23.4 in Ukhiya Upazila in order to assess and verify its interventions according to stipulated screening requisites from WB. Acknowledging this matter, such details are accounted for as given below in Table 1.2.1 along with visual presentation (General Upazila Map) given in Figure 1.2.1. Aerial maps for each sub-project is given in Appendix -5.

Table 1.2.1: Basic Featured Information of components [Sources of data: Field survey, 2020: DDC & LGED]

COMPONENT'S NAME UNDER W-23.4	GPS COORDINATES	DISTANCE FROM UPAZILA HQ	UNION	WARD	LOCATIONS UNDER PROJECT INFLUENCE AREA	PRE-EXISTING CONDITION OF ROAD	PROPOSED ROAD TYPE	ROAD DIMENSION(M) (LENGTH X WIDTH) = FOOTPRINT (SQ.M) *
UKHIYA - MALVITA ROAD ID:422944054	**Starting Point** 21.24782^0 N 92.13453^0 E **Ending Point** 21.24737^0 N 92.14028^0 E	500m	Rajapalong	5	Malvitapara	HBB (Broken)	Bituminous Carpeting (BC)	(700mX4.9m) = 3,430 sq.m

*Note: Roads are proposed to have average carriage way of 3.7m with 0.6m shoulder on each side; special conditions may prompt further adjustments while in construction period. However, footprint for roads are calculated with an average of 4.9 meters.

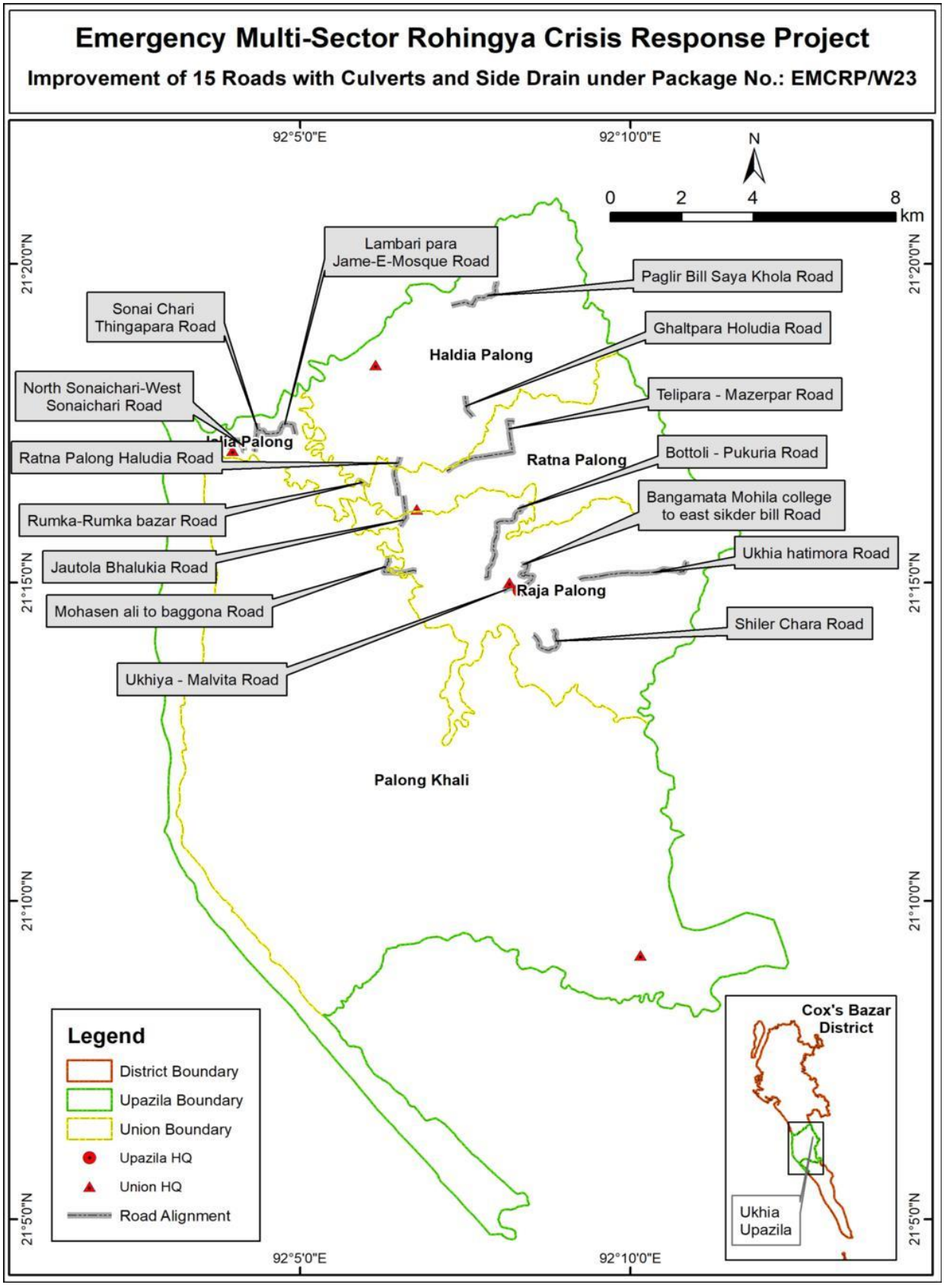


Figure 1.2.1: Map illustrating Roads of Work Package EMCRP/W23 locations in the Ukhiya Upazila

1.3 Proposed intervention items of sub-projects

The roads under work package 23.4 have been proposed with specific need basis dimensions to accommodate and ensure best quality interventions for local stakeholders. In context of governing environmental circumstances and geo-meteorological conditions, protection work items have been added to construction design for safety and sustainability of each proposed roads. These roads are abutting agriculture hence, construction and improvement works will descent these roads into new circumstances in some parts. These items have been included on the basis of field survey and analysis of these conditions. Please follow the table to acknowledge these items.

Table 1.3.1: Proposed safety interventions of each sub-project

W23-4: Ukhiya - Malvita Road Id: 422944054
02 nos. Cross Drain (dimension: 0.975mX 0.975m) at Ch. 591m, Ch. 676m, and **01 nos. Box Culverts** (dimension: 2.0mX2.0m) at Ch. 1362, **544.0 m RCC U-Drain** at different chainage, **Road safety** work and **Environmental Mitigation and Enhancement** works are also included. Description of safety works and environmental enhancement works can be found in BOQ attached in Appendix-03.

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS

2.1 Methodology

Public participation and community consultation have been taken up as an integral part of environmental assessment process of the project. As part of the impact assessment, participatory public consultation was conducted in areas of concern for proposed road by the field level staffs and consultants from PIU and D&SC. The consultation meeting was attended by disparate social groups representing local habitants, separate age groups, social class and occupations. In some cases, IUCN employees in charge of elephant watch tower were present where frequent elephant movements occur. The participants were also selected from different segments of stakeholders, and some of whom will have major active roles before, during and even after the construction works. Therefore, the meeting was organized in an informed, expressive and unbiased manner, wherefrom different views and concerns came across which will be properly taken care of during the design and construction phases. In order to serve our screening process, relevant items were thrown towards the audience to discuss and troubleshoot confusing or worrying matters regarding the proposed intervention under package work. Impacts in regards to environment, socio-economic matters during pre-construction, construction and post construction phase has been put forth. Possible mitigation measures and relevant needs have turned out during these sessions as well. Moreover, their comprehension as a stakeholder has been up lifted in light of project guidelines.

However, public consultation is a living process as the types of problems/ difficulties, involved parties or stakeholders and mode of settlement or resolution processes are more likely to differ with time. Thus, consultation with different parties or stakeholders will be continued throughout the sub-project implementation period and records of resolutions, whatsoever and wherever possible, will be kept in writing at the site and made available on any enquiries or requests by all parties concerned.

All components under the work package have been put through review for locating impediments or possible adversity effecting future environment and socio-economic conditions. In order to comprehend surrounding features and impacts which may stipulate with it, screening has acknowledged having a Project Influence Area (PIA) of 0.5-kilometer radius. Sensitive findings have been identified if any, and relevant mitigation or minimization measures were suggested to subdue such complication for over the project construciton period. Moreover, evaluation was inspired to enhance environmental features and include monitoring initiatives under ESMP budget to ensure exertion of environmental improvement propositions. Contractor's responsibility has been taken into account while identifying possible impacts through sets of intervention accounts. These steps have been initiated strictly following ESMF guidelines and requirements. Environmental screening procedure was motivated by ingredients highlighted in Appendix-2 of ESMF. During survey, detail chainage length of the sub-projects was taken into account for detailing environmental and socio-cultural features within 100 meters buffer zone of both Left and Right side from the center line of the road. Longitudinal intervals of 300 meters have helped to identify positions of sensitive or near-sensitive socio-cutural features. These findings are illustrated in **Annexure-01**.

2.2 Important features/establishments within the PIA

Initial screening process is conducted through direct involvement of PIU and D&SC in the influence area of the proposed component, which allows to raise significant questions and ideas towards participants. In combination of both field walk-through and inputs of audience, a register of existing features is formed. Allow the following table to describe such elements in all the work package components.

Table 2.2.1: Important features within Project Influence Area for W23.4

Component's name under W-23.4	Direction	Important features/ establishment (approx. distance from the proposed site)
Ukhiya - Malvita Road Id:422944054	North	Wahabi Eyatimkhana/Hefzokhana(500m), Malvita Jame Mosque(1km), Polli Budyut office(50m), Bongomata Mohila College(900m), Prottashi office(10m), Grameen Bank (20m NE)
	South	Forest office (750m), Ukhiya School(500m), Dakbanglo(500m), Polli biddyut electricity generation plant (10m)
	East	Veterinary hospital (700m), NGO forum(50m), IRC Office(20m)
	West	Press Club(30m), Shahid Minar(30m), Shorkari Mosque(30m), Buddhist Crematorium(250m)

2.3 Issues and Recommendations raised by the Participants in regards to component interventions

After inauguration has set in motion, their valuable opinions and remarks came pouring out. At this point, we find our field base knowledge for assessment attributed impact degrees and possibilities. Please follow the table 2.3.1 given below to recognize participants' inputs arranged in relevance with this component. Consultation meeting summary, attendance sheets and pictures of separate meetings with proposed location for this sub-project component can be found in Table 2.3.2 and Annexure-02 and Annexure-03 respectively.

Table 2.3.1: Issues and Recommendations raised by the Participants

COMPONENT'S NAME UNDER W-23.4	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
UKHIYA - MALVITA ROAD ID:422944054	•They are very much concerned with absence of reliable path route in Malvitapara area. •Lack of proper and strong road keeps motor vehicles from accessing these locations. • In case of emergency conditions such as ambulance services cannot reach these locations. • Heavy transports are prone to accidents due to bad road conditions. •Possible dust and noise pollution during the construction works should be considered. •Safety of children and adults at the sites during construction works.	• Local people considered that the selected site is suitable for the construction of this road from both the technical and social-environmental (direct savings in the cost of operating vehicles, time savings by travelers and freight, wider effects can less accident rates, road being waterproof and dust free, much more durable) point of view. It will provide better mobility and access to services in due time. •The road should consider water flow during rainy seasons thereby ensuring the construction is not affected by mass water flow. •Enough pathway is expected for vehicle movement so that comfort travel is achieved. •Construction site safety should be ensured to avoid any mishaps or accidents during work periods.

COMPONENT'S NAME UNDER W-23.4	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
	•Elephant movement is not present. •Local community wish to have a better drainage system along with the road in order to allow waters from undulated terrains to find an uninterrupted pathway not causing harm to agriculture fields and wash away top soil of adjacent grounds residing alongside the road. It will protect the top soil for future growth of crops and aid vegetable farming. •The participants have expressed their greater interest for this intervention and believes this will bring nothing but prosperity for the entire catchment dwellers. •Household fences along the road should not be affected while construction • No trees should be harmed for preparation of this road however some trees will fall for this intervention at several locations, around 5 trees. • Available pathway to usher material delivering vehicles • Labor shed availability in the target location • Identification of material storage.	•They considered moderate amount of lumbering and suggested tree plantation initiatives. •They also requested to involve the local community to construction work and they will welcome any outside key labor. •During construction period, alternate route to pass through this area is available. •Since the road is passing alongside homestead gardens and agriculture fields, the intervention will invite air pollution on moderate level during construction period. However, preventive actions and measures can be taken to keep air quality from degrading. •Priority for jobs should also consider women. •Participants, made certain that they will provide surveillance over raw materials and material storage area. •They have also ascertained that the selected site is free from any events related to resettlement and major environmental impacts. The adverse environmental impacts that may come in the way of air quality, noise, solid waste, occupational health & safety during the construction period, and will be of short duration, yet proper management/conservative options should be adopted. • Two access point called forest road and Cox's Bazar-Teknaf highway are available for access of material delivering vehicles. • Alongside the road since there are available open space, these can be used as labor shed and material storage.

Table 2.3.2: Consultation Meetings Summary

Road Package Number	Date DD-MM-YYYY	Venue	Main Participant Groups	No. of Participants	Remarks (If any)
W23-4	07-10-2020	Borhan Cooling Corner Shop	Host Community	21	The local individuals, elites, chairman and/or member of respective Union Parishad, representatives from different agencies participated in those consultation events.

3. ENVIRONMENTAL SCREENING

3.1 General

This section identifies the potential impacts that the various elements of the proposed Project may have on the physical, biological and socio-economic environment within half a kilometer of the radial distance around the site. Environmental Assessment (EA) based on this screening study for the Sub-project has been conducted to identify and determine which potential Project impacts may be significant and therefore require the application of reasonable and effective management and/or mitigation measures.

In order to realize the exact physical, biological, socio-economic and environmental impacts of the proposed sub-project sites and the influence area in regards to the implementation measures, an extensive field visit was carried out in each proposed sub-project PIA. Environmental Screening form, as adopted in **Appendix 2** of the Environmental and Social Management Framework of EMCRP, was administered for identifying the impacts and their extents.

The screening data and information for this sub-project component and details screening summary have been formulated and shown in **Appendix-01.**

3.2 Major Findings

A complete view of current environmental conditions of individual sub-projects in relation to interested queries has been congregated in order to understand the degree of impacts corresponding with marked interventions. Interestingly, most sub-project has correspondence with its surrounding features and upholds interchangeable impacts. However, the degree is not an interchangeable factor since scale is not parallel to each of these components which is where, mitigation measure differentiation is implied. There are some cases where unique circumstances have been met with while environmental screening took place which is also accounted for and should be a matter of concern for other parts of the ESMF initiative. The significant issues observed for this sub-project component is enlisted in following Table 3.2.1 with pertaining impacts. Moreover, impacts that are adventitious has also been embraced for promoting best practices.

Table 3.2.1: Concerning environmental issues relating to each proposed subproject and influence area.

COMPONENT'S NAME UNDER W-23.4	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
UKHIYA - MALVITA ROAD ID:422944054	It is not located within any major environmentally sensitive area.	It will not cause any severe negative effects to the environmental settings of the area neither to important environmental features.
	Construction period will induce air pollution while preparing for bitumen and loading-unloading raw materials. Impacts on air quality during the construction phase may turn to negative. The main impacts include dust generation from crushers, vehicles and the transportation of all types of construction materials.	It will invite waste production which may in turn cause minor air pollution due to deposited dust and airborne particles less than PM_{10}. Dust pollution may slightly suffocate photosynthesis however this can be minimized through regular water sprinkling as suggested in ESMP.
	Noise emission from construction machineries and equipment can cause nuisance to local residents and workers.	The ambient noise level might have potential to increase temporarily and intermittently in the close vicinity of active construction fronts.
	No agriculture, fish farming and significant vegetation coverage is located in the ROW nor does it stand over such items. Nonetheless agriculture fields and homestead gardens/forest are found beside the road.	No agriculture land or any forest coverage will get degraded or lost for construction. Liquid waste such as left-over oils or chemicals might run into these adjacent features.
	Construction works will involve chemical usage and preparation of on-site add-ons to the road. Generating scraps and residues.	The runoff from work site may enter existing pond and frustrate the water quality which will be acute however.
	Few amounts of bush (sapling) will be cut down during construction phase at different chainage.	No severe damage will occur or damage to habitat will be faced. It can be managed by introducing small plantation incentives around the proposed location.
	Elephant Movement is not present in the vicinity of the subproject location.	No impact is expected
	No heavy earth excavation work will be involved.	Consequently air, noise and dust pollution will be occurred within a small-scale during construction period only.
	Construction related activities and setting up of labor camps along with associated facilities and their management can cause adverse impacts.	Noise pollution from pilling or drilling, air pollution caused by dust or gaseous emissions from vehicle movement, running of motorized equipment and land clearing, odors and soil pollution from leaking of latrines and fecal sludge, will more likely to take place.
	Chemical spills or improper disposal of construction waste materials due to lack of worker training and misconduct of contractor's safety initiatives.	During the construction period, soil may get contaminated from activities such as handling of hazardous construction materials (such as fuel, lubricants, paints, and solid waste and sewage).

COMPONENT'S NAME UNDER W-23.4	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
	Vibration effects generated from pilling, drilling or other construction works	Any vibration would result in nuisance effects to nearby faunal species, and but will be localized and temporary and will unlikely to result in structural damages to buildings or walls of the adjacent private properties.
	Sensitive environmental, cultural, archaeological, religious sites within 1 kilometer of site includes including Wahabi Eyatimkhana/Hefzokhana(500m), Malvita Jame Mosque(1km), Polli Budyut office(50m), Bongomata Mohila College(900m), Prottashi office(10m), Grameen Bank (20m NE) to the North. Forest office (750m), Ukhiya School(500m), Dakbanglo(500m), Polli biddyut electricity generation plant (10m) to the south. Veterinary hospital (700m), NGO forum(50m), IRC Office(20m) to the east and Press Club(30m), Shahid Minar(30m), Shorkari Mosque(30m), Buddhist Crematorium(250m) to the west.	No disturbance to all these establishments/features is anticipated due to construction activities for the sufficient distance from the construction site, and strict construction site management system- including restrictive work schedule during the daytime only, water-sprinkling twice a day on and around the site, safe storage of materials, etc.

A few incidents of human elephant conflict have been reported in 2018. The IUCN has conducted a study on such conflict. With the support from UNHCR, IUCN has been marking elephant routs and corridors and informing local communities and stakeholders of avoiding the marked areas. As part of the mitigation options, different initiatives have been undertaken, such as formation and capacity development of Elephant Response Teams (ERTs); providing equipment to ERTs to divert in-coming elephants; and setting up elephant deterrent tools (e.g. trip alarms and watch-towers). Though the current chances of occurrence of conflicting incidence are zero, any recurrence would be managed by the ERTs and they will be called if there appears any minute possibility to recur. A map of elephant movement is given in Annexure 04.

In order to offset the loss or attenuating the environmental degradation, a set of mitigation measures will be adopted, on top of general practice of standard construction procedure or following the relevant codes of practices.

3.3 Climate Change Impact Screening

3.3.1 General Overview of the area

Cox's Bazar is one of the coastal districts of Bangladesh and is prone to the effects of climate change due to its geomorphological siting and climate induced effects. The hilly tracts of Cox's Bazar could foster further environmental crisis brought on by indiscriminate deforestation and diminishing groundwater reservoirs, which have been taken place in recent months as the Rohingya crisis evolved. A recent study conducted by World Bank[3] has found that Cox's Bazar will be the worst-hit district in South Asia as average temperatures rise and rainfall patterns become disruptive, by 2050, if greenhouse gas emissions continue unabated.

The hilly region of the country, especially the part in Cox's Bazar is characteristically of muddy soil structure, not of any rocky formation and the stability comes from the roots of the trees. Also rainfall, proximity to the sea, elevation, and land cover are very important factors for analyzing the risk of cyclone. Denudation of trees from hilltops in order for the huge settlement of Rohingya people has already increased the vulnerability to the risk of hill collapse by destabilizing the terrain. Also deforestation at a rapid speed uncovers the land and raise the risk of occurrence of cyclones, as forests protect land from high wind and storm surges where demolishing the trees would make the area vulnerable.

Together with the above-mentioned hazardous situation, again due to sudden extraction of huge amount of groundwater, availability of potable water from shallow tube wells that pump water up from about 150 feet has already reached to a critical level. Averting the problem requires new tube wells to be plumbing deeper into the poorly mapped aquifer, but going deeper than 700 feet in some places may cause salt water to contaminate freshwater resources.

In this case, it is possible that a stationary position of the freshwater-saltwater transition zone can be established via proper management of pumping in the confined aquifer.

The groundwater resource is seen to suffer more from the climate change impact. The impact on groundwater due to climate change impact include

- Sea-level rise could result in a transgression of the sea and a loss of land area. This could also lead to the secondary effect of population migration in the new coastal band due to migration of the coastal population from the encroaching sea, thereby increasing domestic water needs in the new coastal area.

- Transgression of the coast implies that saline storm surges of 1 or more meters depth would penetrate beyond the new coast to new land areas. Storm surges transport saline water far inland of the coast and much of this floodwater may infiltrate the ground in areas where the aquifer is not fully saturated. Even where the aquifer is saturated, denser saline water may

[3] https://openknowledge.worldbank.org/bitstream/handle/10986/28723/9781464811555.pdf

sink into the aquifer during the flood and later from pools of saltwater that remain following the flood[4].

- It has been identified that the salinity is found in the shallow aquifers along the coastline. So the salinity which are found in the groundwater are of lesser concern as salinity will subside over time

- Several researches show that through modeling of groundwater flow that the depletion of groundwater in the host community will persist up until 2022 and the replenishment of water will take place.

Considering the general climate change effects in Cox's Bazar area and offsetting the aggravating environmental situation due to the mass arrival of Rohingya communities, several specific measures including tree planation in sub-project areas, rainwater harvesting from every disaster shelter, construction of drainage facilities along the road length and installing thunder arrester across the areas, have been suggested and will be implemented.

3.3.2 Site Specific Screening and outcome

Climate Change impact on a particular subproject is tough to deduce as the highest resolution of climate model simulation done over Bangladesh is 50km. Depending on the simulation ensemble of Cox's Bazar district, the temperature and precipitation are likely to increase with time.

Site specific climate change impacts are often not so easy to measure or deduce plausibly while the site is confined to a narrow strip of roadways, and associated mitigation or offsetting measures are really hard to plot on the impact areas, though an overall set of measures are often considered in practical aspect. Fig:1 shows the inundation risk map of the subprojects under W-23, none of the subprojects are in vicinity of the severe river flood inundation area. So the risk of flooding is low around the sub-project area

[4] "Implications of Climate Change for Fresh Groundwater Resources in Coastal Aquifers in Bangladesh", World Bank report.2010

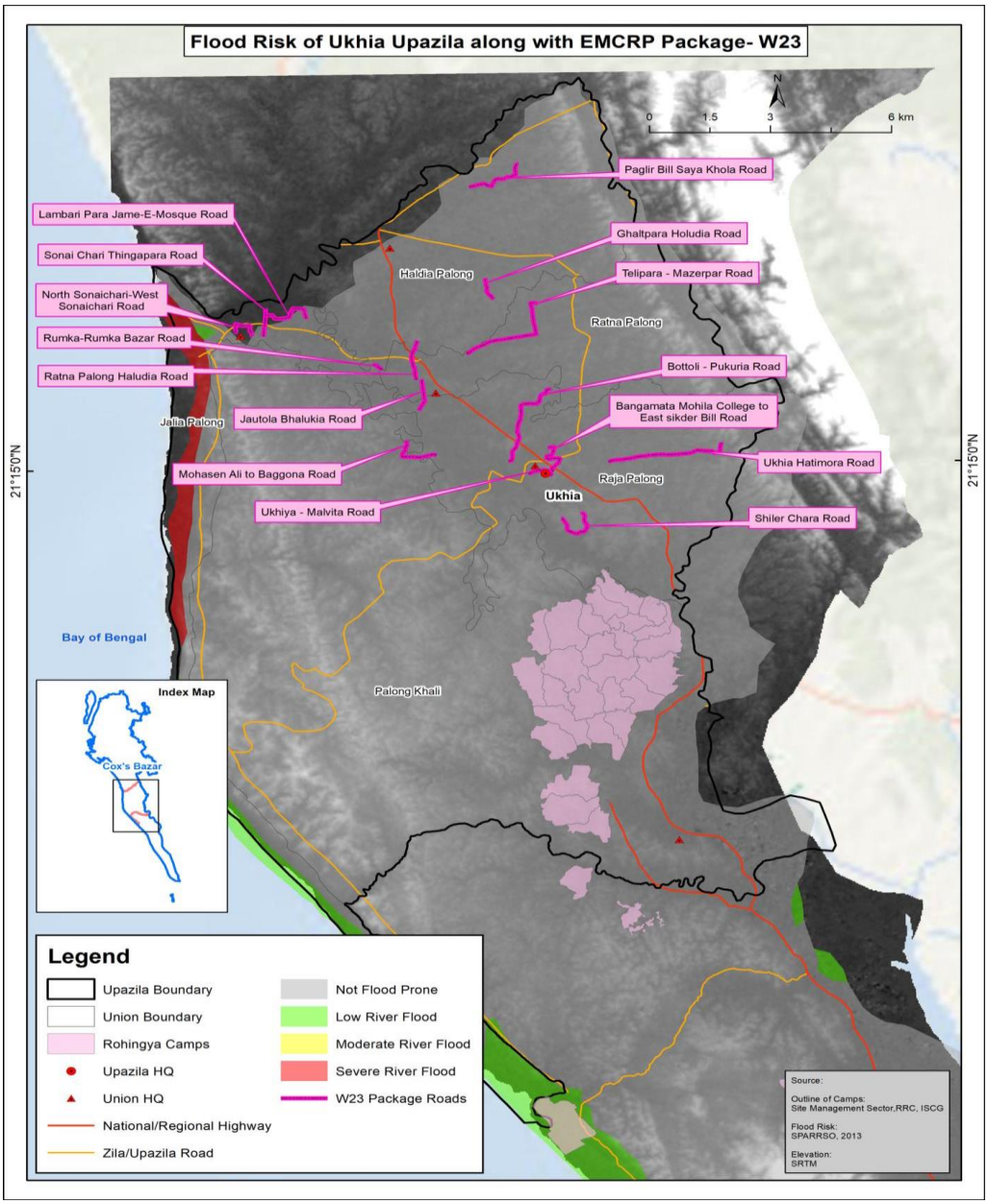


Figure 3.3.2.1: Flood inundation risk map near the subprojects.

Also, in order to avoid the devastation caused by the thunderstorm, state-of the-art thunder arrester (lightning protection system) has been suggested to install having a coverage area of 25,434 sq.m for a single arrester. In addition, tree planation on the road slope/ within the premises is also suggested to sooth the temperature effect and increase the water retaining capacity of soil, at the same time.

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

4.1 General

Considering the environmental settings of the sub-project area, it can be assumed that possible impacts would be largely construction-related, and could be addressed through adoption of good engineering practices; good housekeeping; better *in-situ* construction materials management; and observance of health and safety protocols during the implementation period.

Table 4.1.1: Site Specific Impact and Mitigation Plan under package W23.4

Component's name under W-23.4	Impacts	Mitigation plan
Ukhiya - Malvita Road Id:422944054	To the north Polli Budyut office(50m), Prottashi office(10m), Grameen Bank (20m NE). To the south Polli biddyut electricity generation plant (10m). To the east, NGO forum(50m), IRC Office(20m) and to the west Press Club(30m), Shahid Minar(30m), Shorkari Mosque(30m). Moreover, settlements as shops and households are located adjacent to the sub-project area which can be subject to air pollution. However, none are on the ROW.	Contractor must adhere to the best practice debris management procedure and regular adoption of dust control measures (spraying of water at least twice a day) to minimize the effect to the level best.
	Some part of the proposed road is passing by the agricultural land. **Box culvert** and **cross drain** will be constructed to terminate rainwater for one side to another side during rainy season and also help for rapidly remove excess soil water to reduce or eliminate waterlogging during monsoon and return soils to their natural field capacity and will help to maintain the water balance of both roadside agricultural land to provide a sustainable irrigated agricultural system. It will also help to prevent flood and not to allow water to overflow and also help to divert water for farming. **U-drain** is also considered for drainage facility that runs along the road for uninterrupted water flow.	**02 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 591m, Ch. 676m, and **01 nos. Box Culverts** (dimension: 2.0mX2.0m) at Ch. 1362, **544.0 m RCC U-Drain** at different chainage, **Road safety** work and **Environmental Mitigation and Enhancement** works are also included.

Further construction related activities which may result in adverse impacts in the surrounding environment of the sub project component must be kept under close consideration and appropriate mitigation and management measures will be taken with due care and vigilance. Once the effects are minimized to its least level and controlled efficiently, it will turn into a welcoming and beneficial project for the local communities. The specific environmental management plans have been outlined in **Appendix-2**. The mitigation measures as well as monitoring program of ESMP have also been incorporated in the management plan.

Environmental quality enhancement: Under the additional financing to the EMCRP project, Forest Department of the Government of Bangladesh will afforest along 200 km of road length area, primarily under the Ukhiya and Teknaf Upazila of Cox's Bazar district in order to offset the environmental and ecological devastation, that had been occurred due to the evolution of Rohingya Crisis, to an achievable level. Many of these road lengths will go through and by the Rohingya Camps, up on the hill and are already denuded of trees or vegetation. Local Government Engineering Department (LGED) will allocate and channelize the finance to the Forest Department under the said additional financing component and oversee the progress of works with due diligence. However, this enhancement work will improve the environmental quality of the area and reinstate some parts of the ecosystem services to those areas, though primarily.

4.2 Health and Safety Measure under COVID Situation

Apart from the established Occupational Health and Safety (OHS) measures being followed in construction sites, offices, and labor camps, a set of additional measures has to be taken and practiced throughout the daily cycle by each labor, staff and any involved parties, due to the ongoing pandemic coronavirus situation. Staffs and consultants at PIU and D&S, along with the pool of consultants under different firms/agencies for different services, and all the representatives or staffs of construction contractors and suppliers have to play much sensitive, (pro-) active and responsible roles in abiding by the rules and measures by themselves and getting the involved workers and different stakeholders adhered to the same. A detailed guideline containing a set of measures with shared responsibilities has been sketched out in order to fight the exposure and further spread of this potentially fatal situation. This plan or guideline shall constitute an integral part of ESMP measures for every sub-project, though is not included in this report to keep it concise and specific, and the contractor is required to keep the copy of that guideline at every site office.

However, among many other relevant issues, the guidelines emphasize on following line of directives:

a. Contractor must designate one of his employees as H&S/Safeguards supervisor to lead, coordinate and interface in order to fight the COVID 19 situation under the direct guidance of COVID focal at PIU of EMCRP project.
b. All workers, supervising and supporting engineers and staffs, consultants, service providers and other concerned parties must adhere to the personal health and hygiene rules, social distancing, and other protective measures in full in order to protect themselves and contain the infections any further. Necessary training and awareness campaign will be aligned with the specific sub-project scenario and prevailing conditions.
c. General practice of cleaning and hygiene has to be maintained in all project/site offices and camp sites, and supply of necessary PPEs and cleaning /disinfecting materials along with proper use of those is to be ensured.
d. Public consultation and stakeholder engagement are to be carried out considering the prevailing risks of virus transmission in the target areas, scope of interventions and level of ICT penetrations among the target stakeholders, and so on.
e. Necessary protocols have to be established and maintained in case of handling a sick employee or worker, and appropriate compensation to a sick disengaged labor is required to be given with due documentation.
f. Budgeting for suggested protective measures, along with necessary supervision and monitoring for the required interventions has to be ensured.

Following the additional health and safety measures presented in that guideline, sub-project component specific BOQ items have been inserted to supplement the budget considering the country-specific situation, capacities, and scope of interventions. The additional cost to Health and Safety Measures under COVID 19 situation is shown in **Appendix-3.**

4.3 Cost of Environmental Enhancement Works in BOQ

In consideration to the above-mentioned environmental impacts and their mitigation measures for this sub-project component, a set of items are included in the BOQ of this sub-project. Social Safeguard Personnel for Environmental and Social Management for Work Package EMCRP/W23 has also been added in the whole BOQ in order to take supervision and leadership to organize Environmental Management under Environmental Enhancement Works. The total costing and estimation have included enhancements such as Grass turfing plans, Tree plantation initiatives, Dust Suppression mechanisms. On the other hand, in order to ensure health safety and sanitary measures of workers PPE, First Aid Box, Labor shed, Environmental management, drinking water facility with water tests, Temporary latrine for both male and female as well as waste disposal systems has been accounted for. Ensuring sustainable labor performance in regards to environmental and social considerations motivational training has been taken into account. An overview of the estimation is given below and the detailed estimated cost to implement the ESMP is shown in **Appendix-3**.

5. LIMITATION OF THIS STUDY

Bangladesh government has imposed a nationwide lockdown to curb the spread of the novel coronavirus in the wake of series of deaths and infections. Authorities declared a ban on passenger travel on all sector from March 24 while all public transport on roads have been suspended from March 26 to stem the spread of virus, officially known as COVID-19. All office works have been postponed and an intended visit to the sites for further consultation with the relevant stakeholders has had to cancel due to this crisis. Therefore, some relevant information and arrangement needs awaiting for recovering this pandemic crisis.

6. CONCLUSION AND RECOMMENDATIONS

The overall conclusion is that if the mitigation, compensation and enhancement measures are implemented in full, there will be no significant negative environmental impacts in regards to the selection of location, design, construction, and/or operation procedure of the proposed Sub-project. There will in fact be tremendous benefits from recommended mitigation and enhancement measures and major improvements in quality of life, opportunities in business, trading jobs and ensuring social safety and security will be achieved once the scheme is in operation.

The conclusions of the Screening study can be summarized as follows:

- The communities will receive large benefits through improved infrastructural facilities, transportation & communication etc.
- The short-term negative impacts that may come by the way of air quality, noise, solid waste, occupational health & safety need to be minimized through the management plan.
- The project will create employment for those who live in the vicinity of the construction site and will provide them a short-term economic gain.
- The green belt development, if necessary, for the road site, with large-growing trees at the periphery of the site will give the places a more natural and pleasing appearance.
- A comprehensive Environmental and Social Management Plan (ESMP) has been prepared to mitigate and reduce the adverse impacts that will come out from the Subproject activities.

Implementation of this Sub-project will have large positive impacts to the communities in terms of improved infrastructural transportation & communication facilities, which would eventually develop the socio-economic condition of the catchment areas. So, strong recommendation should be put in place to implement the sub-project within shortest possible period of time, and with great care and efficiency.

Annexure-01: Important Environmental Features (IEFs) near site:

Detail Environmental features within 100m of the both sides from the center line were collected @300m longitudinal intervals. The findings of the survey for the aforementioned road can be seen in the table below:

Table: Detailed Chainage length and features of the Sub-Project component

Road Name	Ukhiya - Malvita Road Id:422944050 **(W23-4)**		**Total Chainage**	700.0m
Chainage (m)	**Left**	**Right**	**Features**	
000-300	L		Tree, Shop, Settlement, Building, Brick wall, open space, tin fence, household connecting road to the left, wired fence with RCC pole, pond, tin fence, building, bamboo fence, household connecting road to the left, building, brick wall, tin fence, trees	
		R	Shop, electric station, bamboo fence, electric pole, electric pole, bush, solar lamp, trees, building, brick wall, tin fence	
300-700	L		Tin fence, settlement, Trees, Electrci Pole, high ground, tin fence, Electric Pole, brick wall, households, trees, electric pole, household road to the left, tin fence, trees, brick wall, garden, building, tree, household, tin fence, electric pole, building, Upazila Livestock officer chamber, trees, household connecting road to the left	
		R	Tin fence, trees, household, tin fence, brick wall, garden, bamboo fence, bush, agriculture field, bush, electric pole, electric pole	

Annexure-02: Attendance of consultation meeting

EMCRP/W23.4

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)

Local Government Engineering Department (LGED)

Public Consultation Participants List

Focus Group Discussion

সময়: 2:15 PM তারিখ: 07/10/2020

উপ-প্রকল্প/এলাকার নাম: Ukhiya-Malvita Road

যে স্থানে হয়: Borhan Calling Corner Shop, Malvita

ইউনিয়ন: Rajapalong ওয়ার্ড নং: 05 উপজেলা: Ukhiya 4750 জেলা: Ukhiya জেলা: কক্সবাজার

সাব প্রজেক্ট নং: EMCRP/W23.4

অংশগ্রহণকারীদের তালিকা (পুরুষ ও মহিলা)

ক্রম নং	নাম	বয়স	পুরুষ/মহিলা	গ্রাম	স্বাক্ষর / টিপসই
০১	মোঃ সাহাবুদ্দিন আনসার	৬০	পুরুষ	আমতিতা	
০২	মরহুম ফিরোজ	৫১	পুরুষ	〃	
০৩	কুদরত আনসার	৬০	〃	〃	
০৪	মোঃ কবির	৫৫	〃	〃	
০৫	মোহাম্মদ ইলিয়াস	৪৮	〃	〃	
০৬	তাহির উদ্দীন	৬২	〃	আমতিতা	
০৭	মোঃ আবুল আনসার	৬৫	〃	ফিরোজ পিন	
০৮	কুদরত আনসার	৬০	〃	〃	
০৯	আবুল আনসার	৪২	〃	〃	
১০	আবুল আনসার	৬৯	〃	〃	
১১	মোঃ জোহর আলী	২০	〃	〃	
১২	ইসাকুর	৬২	〃	〃	
১৩	মোঃ ইয়াসিন সর্দার	২৯	〃	〃	
১৪	সিরাজুল কবির	৪২	〃	〃	
১৫	আবুল হক	৬৬	〃	〃	
১৬	দুর্জিনাল আহমদ		MUP	〃	
১৭	মোছাঃ মিনোয়ারা আক্তার	২৬		〃	
১৮	সুরতবিবি	৬০	〃	〃	সুরতবিবি

EMCRP/W23.4

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)

স্থানীয় সরকার প্রকৌশল অধিদপ্তরের আশ্রয় সেক্টর প্রকল্প

Local Government Engineering Department (LGED)

Public Consultation Participants List

Focus Group Discussion

সময়: 02:15 PM তারিখ: 07/10/2020

উপ-প্রকল্প/কমপোনেন্ট এর নাম: Ukhiya - Malvita Road

যে স্থানে হচ্ছে: Boshan calling Corner shop, Malvita

ইউনিয়ন: Rajapalong ওয়ার্ড নং: 05 মৌজা: Ukhiya 475 উপজেলা: Ukhiya জেলা: কক্সবাজার

সাব প্রজেক্ট নং: EMCRP/W23.4

অংশগ্রহণকারীদের তালিকা (পরিচয় ও স্বাক্ষর)

ক্রম নং	নাম	বয়স	পুরুষ/মহিলা	গ্রাম	স্বাক্ষর / টিপসই
১৯	মোঃ আবদুল হক	৭৮	পুরুষ	বিলাইছড়ি ডেল	
২০	মইনুল ইসলাম	৩১	"	"	
২১	মোঃ জোবায়ের	৪০	"	"	

Figure: Attendance of consultation meeting for W23-4

Annexure-03: Pictures of sub-project component location and surrounding features with public consultation













Figures: Present condition of Ukhiya - Malvita Road Id:422944054 (W23-4) & Public Consultation meeting with Host community

Appendix-1: Environmental Screening Form for examining sub-project component

Environmental Screening Form for Sub-project W23-4

Sub-Project Description Form:

EMCRP/W23- Improvement of 15 roads and construction of culverts with side drains under Cox's Bazar District

Name of Sub-Project: Ukhiya - Malvita Road Id:422944050

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Estimated total cost of sub-project (in Taka): 417,036,298.10 Tk.

Estimated construction period duration: 1 year

Estimated total cost of the component (in Taka): **14,081,948.52 Tk.**

Estimated Operation and Maintenance period (life of sub-project): Project design life more than 15 (Fifteen) years but Government policies on how long projects can operate in the camps.

District: Cox's Bazar **Sub-District**: Ukhiya **Union**: Rajapalong (number 4)

Name of Community/Local Area: Malvitapara

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):
The Sub-Project is categorized as a village road-A with a proposed design of Bituminous Carpeting through construction of Earth Work. Interventions include **02 nos. Cross Drain (dimension: 0.975mX 0.975m) at Ch. 591m, Ch. 676m, and 01 nos. Box Culverts (dimension: 2.0mX2.0m) at Ch. 1362, 544.0m RCC U-Drain** at different chainage. **Road safety** work and **Environmental Mitigation and Enhancement** works are also included. Road safety works are also included in the project activity.

Estimated footprint / land area for this sub-project is 3,430 sq. meter

Brief description of sub-project site: (e.g. present land use, Important Environmental Features (IEFs) near site, etc.:

Proposed road is situated within the catchment area of Malvitapara stretching 700 meters. This road starts at Cox's Bazar Teknaf Highway and ends at Forest Road. Being one of the local communities of main Ukhia upazila these locations are a bit different from rural Bangladesh. There are 2 to 4 stored buildings, government and NGO offices, mosques, paka households and very few agriculture fields. Majority of the surrounding space of this intervention is covered with settlements and establishments. However, there are no significant eco-sensitive features on the pathway of this proposed road.

Overall Comments

The proposed component of the sub-project (Road construction) is not located within any remarkable environmentally sensitive area and will not cause any severe affect to the environmental settings of the area, thus not going to create intimidation to important environmental features. No drainage congestion/water loggings have been observed in the road area. But, some local trees like betel nut tree, rain tree, mango tree, bamboo bushes etc., or additional vegetation may need to clear out due to construction activities, with appropriate offsetting measures to be taken. No agricultural productive soil will be used for the purpose. Earth will be compacted for stabilization. The inputs will be mainly at construction phase and limited within project boundary. Moreover, mitigation measures will be taken according to the ESMP for minimizing the air, dust and noise pollution.

It has been revealed that this project's scopes of works do not intend to overtake their area of lodgment and funding entity has no intention to do so. Moreover, other issue has also been brought to their attention that drainage system and a bridge have also been included into the evaluation of this project since runoff from higher grounds are also a concerning matter during rainy season.

People of the subproject area are very much optimistic about the success of the project and are also eager to participate in the project activities. The subproject is environmentally sustainable and socially acceptable. The local community attended in the participatory public consultation meeting. Their community representatives as teachers, shop owners, farmers and elders have no objection to the construction this infrastructure in the proposed site; the community also appreciated the initiative of LGED to ensure safe access and better portability. The public consultation meeting results confirmed that improvement of this road will increase socio-economic interest in the communities and make lives easier for these people. They also requested to construct the road in accessible width so that small auto and motor vehicles can pass easily. Water flow from undulated terrains is a factor that should be considered for construction because 1 week worth of rain invites water flow which makes this surrounding area logged in several places. On another matter, locals requested to involve the local community to construction works and material storage monitoring duties.

The road is not located within any identified environmentally sensitive area, and therefore, does not seem to cause any adverse impact on the important environmental features. No significant impact is expected on the ecosystem and biodiversity, no agricultural land/ activities or fish farming will be disturbed, due to the construction of the sub projects. Only forest is found as homestead forest on high grounds of the location.

Types of waste to be generated during construction and operation phase:

During construction period solid waste will be generated due to construction activities. The types of wastes are brick pit, unused sand, wood, gravels, bitumen etc. The types of wastes are gravel, stones, rock, wood, copper wires, concrete, iron, plastic etc. Negligible amount of plastic will come as residue. Moreover, liquid waste will include chemicals of bitumen leftovers, motor oils, used oil, Degreasing solvents etc. Human wastes and kitchen wastes will be generated from labor camps as well.

Sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site including elephant migration routes and remaining forests:

Within the influence area of the subproject no historical sites were identified. Sensitive environmental, cultural, archaeological, religious sites within 1 kilometer of site includes including Wahabi Eyatimkhana/Hefzokhana (500m), Malvita Jame Mosque(1km), Polli Budyut office(50m), Bongomata Mohila College(900m), Prottashi office(10m), Grameen Bank (20m NE) to the North. Forest office (750m), Ukhiya School(500m), Dakbanglo(500m), Polli biddyut electricity generation plant (10m) to the south. Veterinary hospital (700m), NGO forum(50m), IRC Office(20m) to the east and Press Club(30m), Shahid Minar(30m), Shorkari Mosque(30m), Buddhist Crematorium(250m) to the west. Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists.

Mostly human settlements are found around the sub-project area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). Elephant migration routes were about 5-6 km away from this sub-project. No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below

Section A: Sub-Project Overview

Description of sub-project/component interventions:

This intervention will include the following items;

- **02 nos. Cross Drain (dimension: 0.975mX 0.975m) at Ch. 591m, Ch. 676m,**
- **01 nos. Box Culverts (dimension: 2.0mX2.0m) at Ch. 1362, 544.0m**
- **RCC U-Drain** at different chainage
- **Road safety** work and **Environmental Mitigation and Enhancement** works are also included (description of such items can be found in BOQ)

Sub-project Location:

Important Features	
ID	422944050
District	Cox's Bazar
Upazila	Ukhiya
Union	4 number Rajapalong
WARD	05
Proposed Chainage	700m
Road Type	Village Road-A
Proposed Intervention Type	BC
Distance from Upazila HQ	500m
Road Starting Point Coordinates and name	Latitude: 21.247820 N Longitude: 92.134530 E Road starts from Cox's Bazar-Teknaf highway
Road Ending Point Coordinates and name	Latitude: *21.282790 N* Longitude: *92.108560 E* Ends in Forest Road, Ukhiya

Land ownership
Government Land

Expected construction period: 1 Year

Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water bodies, etc. and historical or socio-cultural assets): Please also explain any analysis on alternative location was conducted:

Wahabi Eyatimkhana/Hefzokhana(500m), Malvita Jame Mosque(1km), Polli Budyut office(50m), Bongomata Mohila College(900m), Prottashi office(10m), Grameen Bank (20m NE) to the North. Forest office (750m), Ukhiya School(500m), Dakbanglo(500m), Polli biddyut electricity generation plant (10m) to the south. Veterinary hospital (700m), NGO forum(50m), IRC Office(20m) to the east and Press Club(30m), Shahid Minar(30m), Shorkari Mosque(30m), Buddhist Crematorium(250m) to the west.

Within the influence area of the subproject no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (checked with local IUCN representative).

Section B: Environmental Screening

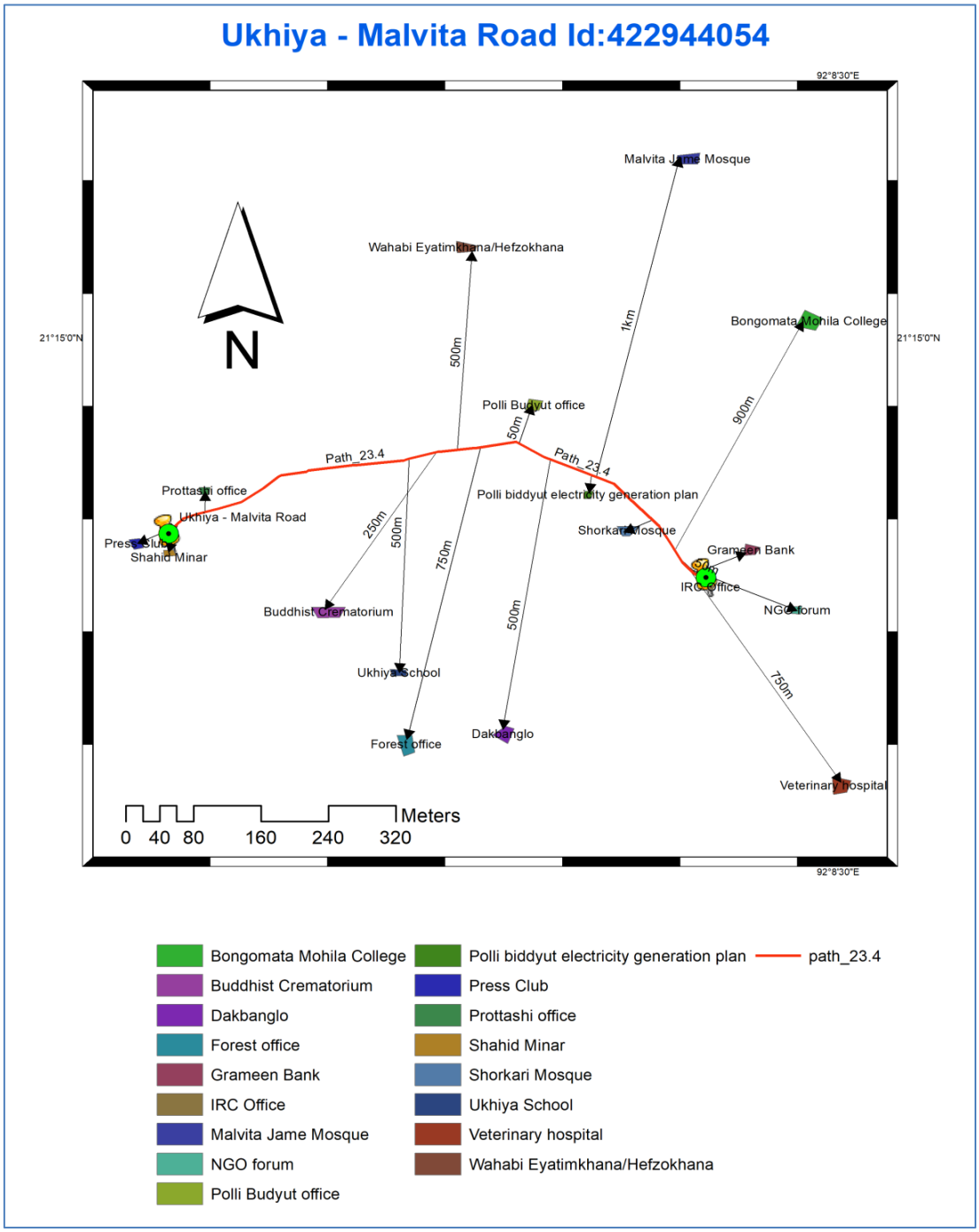
***B.1*: Environmental feature of sub-project location**

Description of cultural properties (if applicable, including distance from site):
Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests:

Wahabi Eyatimkhana/Hefzokhana (500m), Malvita Jame Mosque(1km), Polli Budyut office(50m), Bongomata Mohila College(900m), Prottashi office(10m), Grameen Bank (20m NE) to the North. Forest office (750m), Ukhiya School(500m), Dakbanglo(500m), Polli biddyut electricity generation plant (10m) to the south. Veterinary hospital (700m), NGO forum(50m), IRC Office(20m) to the east and Press Club(30m), Shahid Minar(30m), Shorkari Mosque(30m), Buddhist Crematorium(250m) to the west.

There are no other sensitive environmental, cultural, archaeological sites within the catchment area of this sub-project.

A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas given below.



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive features found in the footprint area, except matured vegetation on the sides of the road which are homestead gardens and forest. Several mosques, madrasa and local settlement were found during the survey. It will not be affected by the construction works, as the activities will be carried out within the existing subproject boundary and necessary preventive and mitigation measures will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*
No. There is no existence of Elephant corridor/ route now, which have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) potential impacts on remaining forests in/around camps Yes/No
N/A (This activity will be confined within the existing subproject boundary)

(3) Other issues: N/A

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:
Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of vehicle-related pollutants 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/ preventable by mitigation measures.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, tractor, trailer, etc. move on roads adjacent to sub-project throughout the day and night generate noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation):

Landslide potential is low. There is low possibility of soil erosion or landslide during construction period of targeted sub-project. The impacts are negative but very small scale, site-specific within a relatively small area and adjustable by mitigation measures.

Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH):

Groundwater is the main source of potable water in the Sub-project area. The shallow depth is about 100 feet to 120 feet and deep tube well depth is 800 to 900 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 400-800ft (Field

survey, 2019). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer. Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)
Status of wildlife movement: **N/A** (None of the information was found about the wildlife movement in or across the area)
State of forestation: Patches of vegetation containing large and matured trees are present in local and homestead gardens across the road side of the proposed subproject area which are located within 200m radial distance.
Summary of water balance analysis (For water supply scheme only): **N/A**

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g. status of access road or any other facility required for sub-project to be viable): An access point called forest road and Cox's Bazar-Teknaf highway is available. It is possible to carry construction materials on these roads to the construction site with limited traffic flow to avoid congestion.
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction: Toilet and water supply facilities will be ensured by the contractor in the vicinity of the construction area for all the components of the sub-project, electric connection will be established with the accommodation facility due for the workforce. Electricity is available in the area.
Possible location of labor camps: Labor camp can be established along the road since there are available open private lands. However, this will have to be done with the consent of land owner under a mutual agreement, with the supervision of the Engineer in charge.
Requirement and type of raw materials (e.g. sand, stone, wood, etc.): i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction.
Identification of access road for transportation (Yes/No):

Yes. Two access point called forest road and Cox's Bazar-Teknaf highway are available as connecting road
Location identification for raw material storage: Adjacent to labor camp or different location is available. However, this will need placement on open fields and should be consulted with local committee. Material storage area must be well fenced and materials will be covered with tarpaulins.
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.): Earth/ mud, plastics, brick chips, dust from bricks during construction of project components will be produce. Also, sludge will be produced from labor camp latrines and kitchen waste mostly composing of organic matters as fiber, starch, carbohydrates and proteins. 10% of the kitchen waste may be classified as plastics or non-biodegradables. Solid waste may amount to 20 kg daily and sludge may amount to 5 kg per day.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g. Solids wastes, liquid wastes, etc.): **Solid waste:** Residual waste from the labor camps will be generated. Equipment maintenance/vehicles on-site and scrap material will occur during construction works which are mostly solid waste. Leftover oils or spills from machinery can be a high probability generating liquid waste. Waste from civil works. And the quantity will be tentatively 150 kg. **Liquid waste**: During construction period fecal sludge will be generated from the labor camp and the quantity would be nearly 6 kg per day, which would be reduced in weight in course of time. Leftover oils or spills from machinery can be a high probability generating liquid waste.
Type and quantity of raw materials used (wood, bricks, cement, water, etc.): **Type:** i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction. **Quantity**: It is difficult to give exact figures of construction waste produced on a typical construction site.
Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards: No such vegetation is present in the right of way. Specific soil amount is not needed for the project. The current condition explains that there is no aggregated soil on the right of way.

Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) The possibility is Medium, for stagnant water bodies to occur. Because water usage will be higher during the construction period. By default, this area has no water logging troubles due to being natural channels. Moreover, no possibilities of stagnation of water in long run. So, local communities have stated that they do not have severe troubles with mosquitos or other disease vectors.
Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No pre - existing drainage channel.
Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. Because under this intervention, there is very little scope of damage to terrestrial or aquatic ecosystems or endangered species.
Activities that can lead to landslides, slumps, slips and other mass movements in road cuts: Scope of work leading to low scale effects of landslide. The impacts are negative but short-term and site-specific. It can be managed through mitigation measures.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description) Low, since both sides of the road is more or less similar elevation. The concentrated outflow will be managed since the sub-project has included drains.
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: No
Chance of long-term or semi-permanent destruction of soils: (High/Medium/Low with description) No
Possibility of odor and water, soil quality impacts from SWM and FSM disposal system: (High/Medium/Low with description)

No.
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) There is no possibility of stagnant water bodies remained for encouraging mosquito breeding and other disease vectors, during the operation phase.
Likely direct and indirect impacts on economic development in the project areas by the sub-project: Construction or implementation of a road project substantially contributes to the development of the project areas. It surely improves the communication network, reduces the transport time, increases the trade and business in/around the areas, and ensures access to better living conditions with amenities, better educational and job opportunities and health facilities. Thus, the direct and indirect impacts on economic development in the project areas would be enormous by this sub-project.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No existing drainage channels or surface water bodies found in the project area; therefore, no such effect can be anticipated
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. There are no protected areas in or around project sites, and no known areas of ecological interest.
Activities leading to landslides, slumps, slips and other mass movements in road cuts: The entire sub-project component area is nearly flat; thus, no such type of impacts is anticipated.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) No
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: Improved communication will definitely increase the traffic/ vehicular movement, which must increase the light and noise pollution, but air pollution effect will not be increased significantly, as the proposed BC road will reduce the pollution generated from dust on the muddy road, especially during the dry season and if the vehicles are maintained in good conditions

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

Section D: Environmental Screening Summary of the Work Package-23.4

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
1: Sub-Project Interventions	**Air quality**	Under the subproject intervention the overall score is **low**.	• Limiting earthworks; • Watering of dry exposed surfaces and stockpiles of aggregates at least twice daily, as necessary; • Requiring trucks delivering aggregates or bricks and cement to have tarpaulin cover and Limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Covering of trucks; • Records of air quality inspection;	Visual monitoring of air quality and if requires, air quality test (CO, $PM_{2.5,10}$) once in construction period in winter season.
	Soil impacts	Under the sub-project intervention the overall score is **low.**	• Precautions might be taken when rainstorms are likely, when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms. • The earthwork sites where exposed land surface is vulnerable to runoff shall be consolidated and/or covered. • The material stockpile sites shall be far away from surface water bodies and areas prone to surface run-off. Loose materials shall be bagged and covered. • Channels, earth bunds, netting, tarpaulin and or sand bag barriers	Construction Contractor monitored by Consultant and PIU	• No visible degradation to nearby drainages, • *khals* or water bodies due to soil erosion. • Rain storms in construction phase.	Monitoring as weekly basis.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
			shall be used on site to manage surface water runoff and minimize erosion. • The overall slope of the work areas and construction yards shall be kept to a minimum to reduce the erosive potential of surface water flows elsewhere.			
	Hydrology (surface and groundwater)	Under the subproject intervention the overall score is **low**.	• All precautions to store chemicals/oil/fuel properly so that no chance of spill. • Workers must specify waste dump locations to avoid littering which in turn might negatively affect surface and ground water. • Monitor water quality according to the environmental management plan.	Construction Contractor and monitored by Consultant and PIU	• Areas for stockpiles, storage of fuels and lubricants and waste materials; • Records of water quality inspection; Water Quality Test • (National Drinking Water Quality Standard Parameters)if requires; • No visible degradation to nearby drainages, *khals* or water bodies due to	Water quality test (mainly GW) twice during the construction period in six months interval.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
					construction activities. • Records should be kept and logged.	
2: Pre-construction Phase	**Sanitation, water supply**	Under the subproject intervention the overall score is **low**.	• Provide suitable housing, adequate supplies of potable water, and toilet and bathing facilities within labor camp area for the assigned laborer. • Provide means for disposing of wastewater from toilets, baths and food preparation areas either through a septic tank and soak away, or holding tank with removal by vacuum truck. • Records for any type of training or awareness building sessions must be kept at site.	Construction Contractor and monitored by Consultant and PIU	• Site-specific H&S Plan; • Records of supply of uncontaminated water; • Record of Health &Safety orientation trainings; • Condition of sanitation facilities for workers	Visual inspection by PIU and supervision consultants on monthly basis
	Transportation	Under the subproject intervention the overall score is **low.**	• Contractor should verify vehicles for the suitability of carrying, loading and unloading of materials	Construction Contractor and monitored by Consultant and PIU	• Record of regular inspection. • Record of accidents/incidents	Monthly monitoring.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
	Storage of construction materials	Under the subproject intervention the overall score is **low**.	• Orienting concerned person and team assigned for the construction work.	Construction Contractor and monitored by Consultant and PIU	• List of materials and sources of materials;	During implementation phase, as necessary with discussion with PIU, Consultant
3: Construction Phase	**Wastes**	Under the sub-project intervention the overall score is **low.**	• Prepare and implement on-site waste water runoff and labor camp waste management plan approved by PIU and consultants. • Wastes must be placed in the designated bins which must be regularly emptied. These shall remain within demarcated areas and shall be designed to prevent wastes from being blown out by wind. • All waste must be removed from the site and transported to a disposal site.	Construction Contractor and monitored by Consultant and PIU	• Complaints from community; • Regular inspection of waste management activity; • Waste disposal record.	As work weekly progresses
	Cut and fill Activities (Cutting of hill slope and earth removal from borrow areas caused for soil erosion and	Under the sub-project intervention, the overall score is low.	• During construction cut and fill will be balanced as far as is possible. Designs shall ensure that as far as possible all cut and fill activities are balanced • Proper care will be taken during cutting and filling so that slope or toe of the road embankment	Contractor, environmental specialist of D&SC	• Location of road alignment and slope.	Daily as work progresses

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
	landslides)		remain within the right of way and does not disturb the crop.			
	Storage of materials	Protected and safety storage to be needed for construction materials storage. Not interrupt natural land contours, disturbance in natural drainage patterns and logging of water and the overall score is **low.**	• With the assistance from site management committee in Camp to identify the storage site and other requirements, which will be approved by PIU and consultants.	Construction Contractor and monitored by Consultant and PIU	• List of materials and sources of materials; • Storage areas for materials and equipment.	Monthly basis during implementation phase, as necessary with discussion with PIU, Consultant
	Removal of Vegetation (May cause soil erosion and their deposition on nearby crop field, affecting soil quality and productivity)	Under the sub-project intervention, the overall score is **low.**	• If during detailed design cutting of trees is required, compensatory plantation for trees lost at a rate of 5 trees for every tree cut. • Prevent workers or any other person from removing and damaging any flora (plant/vegetation) and fauna.	Contractor, environmental specialist of D&SC	• Complaints from community;	Daily

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
	Noise pollution	Under the subproject intervention the overall score is **low.**	• Consultation with affected people; not to operate noisy equipment during working period; • No noisy work after 5.00 pm. • Sound suppression for equipment; • Ear protection for workers. • Conduct noise quality monitoring as per EMP.	Construction Contractor and monitored by Consultant and PIU	• Number of complaints from stakeholders; • Use of silencers in noise-producing equipment and sound barriers; • Noise Level following decibel meter (dB)	Inspection by PIU and supervision consultants on monthly basis;
	Air pollution	Under the subproject intervention the overall score is **low.**	• Water spraying for dust control; construction materials with potential for significant dust generation shall be covered; no smoke emitting equipment; and limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor and monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Records of air quality inspection.	Visual observation and monitoring of air quality during construction period.
	Road Safety and Accidents	Under the subproject intervention the overall score is **low.**	• Erection of suitable signage at construction sites • Direct observation and discussion with local people • Restrict the transport of oversize loads. • Operate construction vehicles to non-peak periods (night) to minimize the traffic disruption. • Enforce on-site and access road speed limits.	Construction Contractor, environmental specialist of D&Sc.	• Complaints from communities, pedestrians	Day basis during work time

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
			• The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc. • Local residents should be kept informed about planned Works			
4. Post Construction	**Road Safety**	Under the issue the overall score is **low**.	• Install traffic signs for speed limit, speed breaker where needed, Mile post and create adequate ***traffic*** detours, and sufficient ***signage*** & ***warning*** signs, Post speed limits and suitable bending on the road. • The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc.	Construction Contractor, environmental specialist of D&Sc	• Road signage and safety instruments at suitable locations and chainage	Immediately after the construction work is over.
	Tree re plantation	Under the issue the overall score is **low**.	• Replantation of trees during monsoon period • Maintain of trees properly • Check survival of trees and replant the dead trees	Construction Contractor, environmental specialist of D&Sc	• Number of complaints from stakeholders; • Records of trees number and tree plantation inspection;	Immediately after the construction work is over.
5.	**Maintenance**	Under the issue	• No advertisement/boardings shall	LGED	• Number of	During Operation

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
Operational Phase	**of road and assets** (Road accidents may increase due to higher number of vehicles using the roads at increased speeds)	the overall score is **low**.	be allowed within the Right of Way limits of the project road. • Regular maintenance and cleaning of assets such as sign boards, road safety sign etc. shall be undertaken. • Clear smooth speed breaker/rough surfaces should be clear in views. • Regular maintenance of road surface and shoulders.		complaints from stakeholders;	under LGED's regular maintenance program in each 3 years.

* Overall Impact Score: High = Likely to cause long-term E&S impacts; Medium = Likely to cause temporary impacts; Low = Likely to cause little, short-term impacts

**Post-construction phase denotes the time period contractor use to clear and clean up the sites after the construction work is ended, perform tree plantation, grass turfing, and minor rectification till the official handing over the site to LGED, or owner of the site.

Recommendation for further environmental and social assessment and/or site specific environmental and social management plan: Yes

**If yes, please specify what assessments/plans would be required.* Mention some recommendation on E&S assessment …. ESMP

If site specific environmental and social management plan (ESMP) is followed the impacts can be mitigated and monitored. ESMP is attached.

Appendix-2: Environmental and Social Management Plan (ESMP)

ESMP for Access and evacuation Roads; *(LGED/EMCRP-W23.4):* Ukhiya - Malvita Road Id:422944054

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
Pre-Construction Stage	Loss of land / and other physical assets	• No land acquisition is allowed within this sub-project activities So, there are no any mitigation measures according to this impact.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of livelihood	• Under this subproject, there is no scope of negative impact of adjacent livelihoods	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Stakeholders Engagement	• All of the project stakeholders should be consulted • Separate community level consultation meeting with the potential affected HHs • Consultation meeting with host communities about the project objectives and scope of works	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of right to access	• Project to ensure thorough analysis of alternatives that access enjoyed by the community remains intact. • In case of unavoidable circumstances, alternative access will be provided.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Site Selection & implementing interventions: Human-elephant conflict	• Selection of sub-project sites and all implementing interventions must take place outside of the elephant corridor/influence area.	PIU	Environmental Consultant of PIU, PSC
Pre-Construction Stage	Site Preparation: Soil Erosion; Alteration of natural drainage	• Our selected sites avoided the low land near the water bodies or natural flow path to avoid the flash flood or any kind or surface runoff.	PIU & Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Tubewell location within the construction site is not near to any kinds of latrine and soaks well which could be contaminated by those. • After completing the development we restored the place as like before to avoid the cut and fill operational problems. • This site is in the local community, so we discussed with the local community to avoid any conflicts related local habitation, culture. • Sub project intervention mustavoid of natural disturbance of existing slop and natural drainage. • The contractor ensuring sound environment for the local residents near the sub project site.		
Construction Activity	Noise from construction works	• Construction activities mostly will finish at day time within 05 PM, and must confirm proper measures for avoiding any disturbance. • All Personal Protective Equipments (PPEs) must be ensured in sites before starting any kinds of construction works.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Dust	• Acceptable range of emission of CO, particulate matter [SPM (**Suspended particulate matter)**, PM2.5, 10] and Hydrocarbons must be maintained through good construction work practices • Dust generation must be limited as a result of clearing, leveling and site grading operations with	Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		using water florescent manually and through water pipes. • Dust generation due to vehicle movement on connecting road shall be controlled by watering the path at limited level		
Construction Activity	Safety Issues	• Unauthorized entry is completely prohibited in our site and take necessary measures for preventing this problem • Before works started Contractor must provide proper training and guidelines on health and safety issues to the labors and associated staffs. • Records of every training must be kept at site. • All kinds of Child labour are completely prohibited in every site. • Every construction materials storage site will be well fenced by Tin and safety caution tape.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Traffic Management	• Contractors will maintain proper route for traffic management which is to beconsulted with and confirmed by the Executive Engineer of Cox's Bazar.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Conflicts with existing users due to the scarcity of resource base.	• A detailed assessment of the available resources and consent of the local representative for withdrawal of water from existing surface water sources shall be taken. • If ground water is withdrawn, adequate approvals from the appropriate department need to be undertaken before setting up bore wells.	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Any type of consent letter or agreement for withdrawing water from either surface or underground sources will be kept on site. • Local community must be consulted before any construction works starts.		
Construction Activity	Increase in road accidents	• Maintain safety measures during the movement of heavy machinery and equipment. • Local community will be trained up on traffic management and awareness.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Labour Base Camp: Conflicts with the local residents	• Awareness building session will be undertaken about prevention of child abuse, child marriage, GBV, sexual harassment, trafficking of women and children as well as illegal drug trade. Written records of this awareness building session shall be kept on site. • Work force should be prohibited from disturbing the flora, fauna including hunting of animals, wildlife hunting, poaching and tree felling. • Adequate facilities ensuring sanitation for labour camps will be put in place • Treated water will be made available at site for drinking purpose. • Adequate accommodation arrangements for labour forces. • Labor code of conduct is to be disclosed through consultation.	Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Construction Activity	Waste Management: Improper	Preparation of a waste management plan covering the	Contractor	Environmental

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
	management and handling of hazardous and non-hazardous waste during construction.	following aspects: • Residual waste from the temporary accommodation facilities for labor Waste and from equipment maintenance/vehicles on-site • After completion of construction works. So, recycling process is not applicable. • Proper consents for hazardous waste management.		Consultant of PIU, PSC
Construction Activity	Health & Safety Risks: • The potential for exposure to safety events such as tripping, working at height activities, fire from hot works, smoking, failure in electrical installation, mobile plant and vehicles, and electrical shocks. • Exposure to health events during construction activities such as manual handling and musculoskeletal disorders, hand-arm vibration, temporary or permanent hearing loss, heat stress, and dermatitis.	• All construction equipment will be properly inspected timely. • The risk assessment will be prepared and communicated prior to the commencement of work for all types of work activities on site. • Preparation of proper walkways and clearly designation as a walkway has to be ensured; all walkways shall be provided with good conditions underfoot; signposted and with adequate lighting. • Proper Signpost at any slippery areas will be ensured in construction site. • Fire extinguishers will be located at identified fire points around the site. The extinguishers must be appropriate to the nature of the potential fire. • This sub project has Proper communicative emergency response plan (ERP) with all parties, the ERP to consider such things as specific foreseeable emergency situations, organizational roles and authorities' responsibilities and expertise, emergency	PIU & Contractor	Environmental Consultant as well as Social Development and Gender Specialists of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		response and evacuation procedure and personnel will be trained and drilled to test and ensure the coherence with the plan. • All people of construction site will be concerned about the safety and maintenance of Electrical equipment; works will be carried out on live systems. • Provision to first aid box in sub-project areas will be ensured. • Proper Emergency evacuation response plan will exist in sub-project area. • All safety equipment will be available in sub-project site (safety, size, power, efficiency, ergonomics, cost, user acceptability etc.), the lowest vibration tools will be provided that are suitable and can do the works. • Awareness training will be given to all personnel involved during the construction phase in order to highlight the heat related illnesses of working in hot conditions such as heat cramps, heat exhaustion, heat stroke, and dehydration. Written records of this awareness training shall be kept on site. • Adequate quantities of drinking water will be available at all Sites, on different locations within the site. • Provision to maintain proper PPE wherever necessary and to ensure that there are satisfactory washing and changing facilities. • Provision to ensure all workers exposed to a risk are		

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		aware of the possible dangers and also given thorough training on how to protect themselves and there should be effective supervision to ensure that the correct methods are being used.		
Operation &Maintenance	Noise disturbances to fauna	• Provision to maintain noise and vibration from the operation and maintenance of machinery and equipment by proper monitoring and measures. • Provision to take necessary lighting, caution for the works and necessary maintenance should be done in day light.	PIU	Environmental Consultant of PIU, PSC. Union Member
Construction activity	Odours and pollution caused by leaking latrines and faecal sludge, and solid wastes impacting surrounding water bodies, flora and fauna	• Preventative maintenance schedule should be followed. • Solid organic wastes should be stored in bins and/ or skips and emptied regularly at a designated waste disposal area away from the camp site. If no designated site is available within the reach, a dug-hole at a nearby place can be used with periodic filling with soil layer for preventing pollution and generating nutrient rich compost soil over time.	PIU	Environmental Consultant of PIU, PSC. Union Member
Decommissioning during the project implementation period (including site clearance after the construction)	The impacts are similar to those listed in construction stage: • Pollution from waste materials • Health & Safety risks to workers and local community	• Contractor must prepare a demolition and waste management plan including following directive aspects given hereunder.	PIU / Contractor	Environmental Consultant of PIU, and Executive Engineer of Cox's Bazar

Waste Management Plan:

The Contractor shall develop a waste management plan for various specific waste streams (e.g., reusable waste, flammable waste, construction debris, food and organic waste etc.) prior to commencing of construction and submit to LGED for approval. The plans must include following principles or series of actions, which will be carried out/followed by the contractor and supervised by the Field level Environmental Specialist and Social Development Specialist.

For wastes:

- The quantity of waste materials shall be minimized by 3R (Reduce, Recycle and Reuse) approach, and wastes shall be segregated accordingly, wherever practical; and stored in designated places/facilities in the site.
- Construction site shall be maintained in a cleaner, tidy and safe condition and appropriate facilities shall be provided and maintained as temporary storage of all wastes before transportation and final disposal.
- Hazardous waste viz. waste oil etc. will be collected and stored in a paved and bounded area and subsequently sold to authorized recyclers.
- The scrap material generated from related construction activities will be collected and stored separately in the stack yard and sold to local recyclers.
- All wastes generated during construction shall be disposed off in an environmentally acceptable manner. This will include consideration of the nature and location of disposal site, so as to cause less environmental impact.
- Other leftover non-hazardous wastes, including construction debris shall be transported to an approved disposal site by pick up tracks or back loaded vehicles with proper care.
- Organic wastes produced in the camp site during the construction period shall be collected and transported in vehicles covered with tarps or nets to prevent spilling waste along the route to the designated disposal site;
- Burning of any type of wastes in the construction site shall be prohibited completely.

Prepared by: Harogopal Kabiraj, Environmental Focal Person, +8801714980171

Tanvir Ahsan Haque, Environmental Specialist, +8801688117059

Ms. Sadia Azad, Disaster and Climate Change Specialist, PIU.

Reviewed by: Md. Saiful Islam, Field Level Environmental Specialist, +8801913442006

Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.4

In consideration to the above-mentioned environmental impacts and their mitigation measures for this sub-project, individual BOQ for each component has been prepared. Following tables will illustrate such items of enhancement and impact mitigation works as well as considering the emerged situation of COVID-19, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites.

Cost of Environmental Enhancement Works for W23-4 in BOQ

Sl no.	Description of item	Quantity	Unit price	Total amount
1.	**Grass Turfing** Turfing on embankment top and slope & any critical place with good quality turf supplied by the contractor of not less than 225mm square in dimension including placing and watering till grass is fully grown, etc. all complete as per direction of E.I.C. (Payment to be made only when grass is fully grown)	2089 Sq.m	@38.15 Tk. Per sqm	79695.35
2.	**Dust suppression measures** Dust suppression measures like water sprinkling on aggregates/unpaved roads, in and around the work site and as per direction of E-I-C	720.0m	@ 2.56 BDT	1843.20
3.	**Water Supply and Sanitation** Providing and maintaining adequate portable water supply, sanitation, cleanliness facilities at camp site and work site to the entire satisfaction of Engineer-in-charge. **Temporary Toilet:** Construction of temporary toilets in work site/ rest area complete as per design and specifications and approved by the Engineer-in-Charge. There should be 1 camp in each site. In each camp, there should be 1 no of toilet for women and 1 no of toilet for men.	2 nos.	@12822.86 per toilet	25,645.72

Sl no.	Description of item	Quantity	Unit price	Total amount
4.	**First Aid Box** Supplying, equipping and maintaining adequate first-aid box throughout the working period at worksite and site office, and erect conspicuous notice boards directing where these are situated and providing all requisite emergency medical first aid kits, including complying with the government medical or labour requirements at all times, and provide, equip and maintain necessary dressing kits throughout the working period for attending minor injuries, etc. all complete as per requirement and full satisfaction of Engineer-in-charge.	1 no.	LS @5000 Tk. Per box	5,000
5.	**Drinking Water Facilities** Providing continuous adequate drinking water supply at worksite and site office as well by installing necessary tube-well/s where applicable or any other means depending on local situation, also providing essential arrangement for storing drinking water by supplying portable best quality water tank equivalent to Gazi/Padma of adequate capacity depending on the number of users, including supplying 1 (one) no. best quality water filter of minimum capacity 30 liters with necessary kits, etc. all complete as per satisfaction and direction of the Engineer-in-charge.	2 no.	LS @ Tk. 30,000	60,000
6.	**Traffic Management** Maintaining traffic management at worksite from time of commencement of contractor's activities to time of completion activities, including ensuring that the road is safe for users, providing a safe working area for those involved in work on trafficked network and minimizing any disruption to smooth flow of traffic (this includes providing necessary barricades, warning signs/lights, guide signs, flagmen, maintaining diversion roads by cutting, filling, constructing, etc. or by any other means) in accordance with the full satisfaction of the Engineering-in-charge.	1 no.	LS @ Tk. 15,000	15,000

Sl no.	Description of item	Quantity	Unit price	Total amount
7.	**Personal Protection Equipment for Workers** Providing and maintaining appropriate (safe design, fit and comfort) personal protection equipment (PPE) to ensure the highest possible protection for employees in establishing and maintaining a safe and healthful working environment at workplace, including demonstrating, providing training on proper understanding and development of skill in the use of PPE, including supplying (i) best quality safety jacket, (ii) suitable hand protection gloves, (iii) appropriate foot protection shoes, (iv) best quality safety helmets, face shields, ear muffs etc. (v) suitable eye protection goggles	LS	LS @ Tk 30,000	30,000
8.	**Tree plantation** Tree plantation to compensate the felled down trees and enhance the ecological condition in the subproject area- preferably local fruits, flowers, medicinal and ornamental trees- Mango, Jackfruit, Jam, Kathbadam, Chalta, Krisnachura, Bokul, Jarul, Polash, Kadom, Shimul, Neem, Arjun, Amloki, Horitoki, Bohera, Mahogany, Palm Tree, Chambal, Rain Tree, Shil koroi, Satim, Sishu (including protection, fencing and conservation during project defect liability period): Preferably at both sides of Road where space is available (fencing as per LGED rate schedule 5.26.14) (Contractors will also be instructed by the consultant and PIU prior to the tree plantation work) at an interval of 10 feet.	80 nos.	@ Tk. 1000	80,000
9.	**Motivation training** Motivation training (twice: before and after construction start) of the Upazila Engineer 'sand Contractor's representatives on safety practice and as per direction of the E.I.C.	1 no.	LS @ Tk. 10,000	10,000
10.	**Waste disposal facility** Temporary camp site waste disposal facility improvement 2 nos. (1 no of organic waste and 1	LS	@ Tk. 5000	5,000

Sl no.	Description of item	Quantity	Unit price	Total amount
	no of inorganic waste disposal facility) and as per direction of E.I.C.			
11.	**Water Test (Drinking Water samples)** Water samples are to be collected periodically (half yearly) from the tube well at labor shed area for laboratory analysis of different parameters such as pH, arsenic, iron, chloride, hardness, total dissolved solids, nitrate, nitrite, coliform, electrical conductivity etc. all complete as per direction of E.I.C. (including the cost of actual fees for testing from reputed laboratory and report) as desired by E.I.C.	LS	@ Tk. 5000	5,000
12.	**Working labour shed:** Construction of Labor shed (Size: 30'x20') with C.I sheet Roofing, Tarza fencing and brick soling floor as per requirement and direction of the E-I-C.	1 no.	LS @ Tk. 30,000	30,000
13.	**Environmental management** Environmental management costs of the Environment & Social/ Safeguard Personnel for Environmental and Social Management and Monitoring during construction and operation phase for their salary & transport (Net payment excluding Tax &VAT). And as per direction of the E.I.C. **(One Safeguard Personnel for R1, R2, R4, R10, & R13)**	1 person	Monthly basis @Tk. 35,000.00 for 12 months. One person covering 5 roads i.e.35,000Tk.*12 months*(1/5 one road).	84,000.00
	Subtotal Bill: Environmental facilities			**431,184.27**

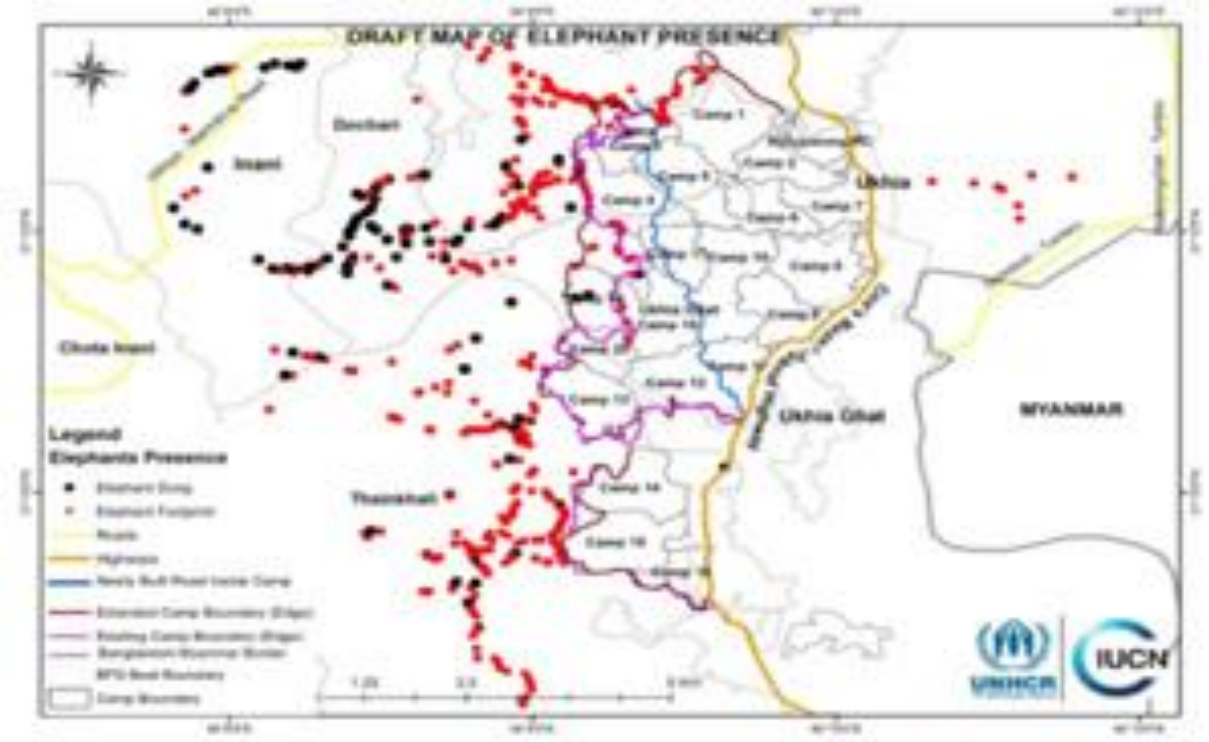
Cost of H&S Measures under COVID 19 Situations for W23-4

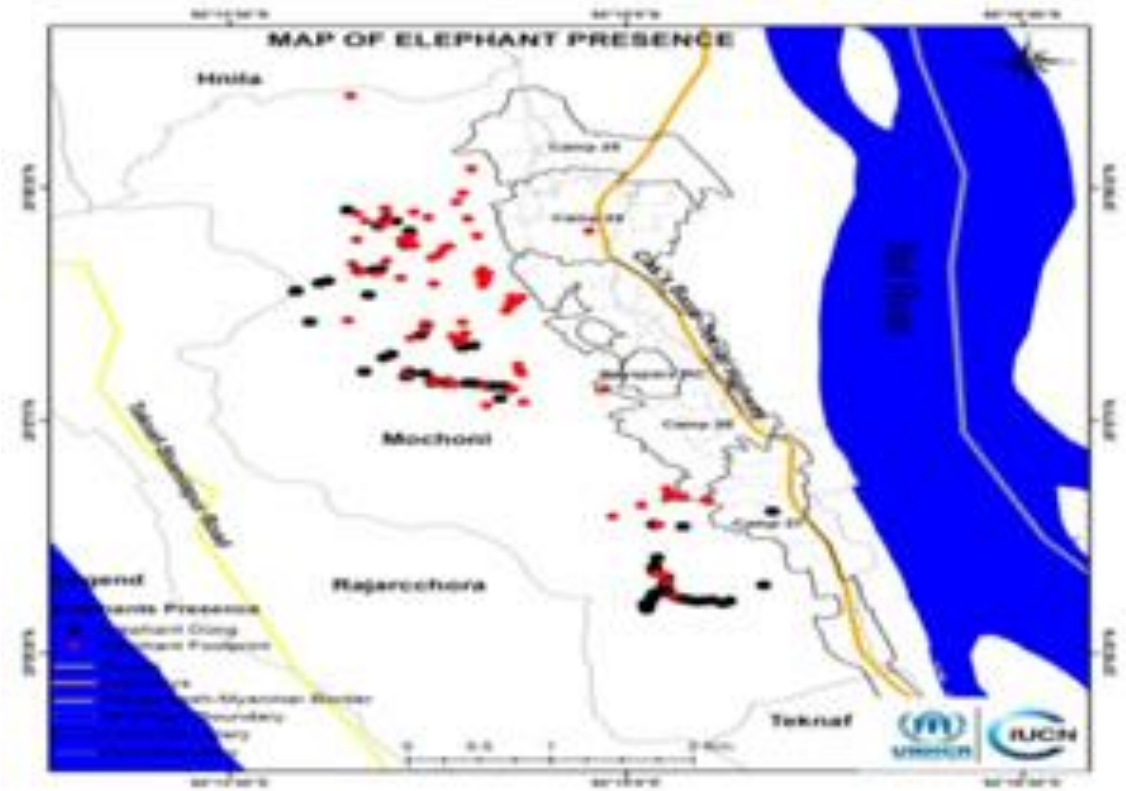
Considering the emerged situation, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites. The cost is estimated counting 15 workers for 270 active working days (9 months in a year) in a contract period for one site under this package (EMCRP/W-23.4).

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
1.	Non-Contact IR Digital Thermometer	01 nos. in each site	N/A	N/A	5,000.00	1	5,000.00	Each site office will have a thermometer for checking body temperature every morning at the entrance of the working site
2.	Wash Basin with Small Water Tank, Bucket and Mug (or piped water supply)	01 nos. in each site	N/A	01 nos. in each camp	10,000.00	2	20,000.00	Wash basin to be installed at favorable locations immediately after the entrance to the facility
3.	Trash bin (covered)/Paddle Bin	01 nos. in each site	N/A	01 nos. in each camp	550.00	2	1,100.00	
4.	Bar Soaps (150 gm each)	41		51	50.00	92	4,600.00	To be placed in a case/holder on the basin, for washing hands for max. 37 people a day and showering of 32 workers in each labor camp.
5.	Hand Sanitizer (2 nos. 250 ml bottle and 5 liter Can for Refill)	2 bottles and 1 Can for each site	N/A	N/A	4,000.00	1	4,000.00	2 bottles and a 5 litre can for each Site office
6.	Face Shield/ Protective Safety Goggles	9 nos. for each site		N/A	400.00	9	3,600.00	For labors who work in close contact, 9 in each site

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
7.	One time Mask (Disposable) for Contractors' Staffs	5 nos. each day in each site		N/A	12.00	1350	16,200.00	Reusing N95/KN95 mask will not be a manageable option in field scenario, one time disposable medical/surgery mask a good option instead.
8.	Cloth mask for Workers	N/A	15 nos. for each labor camp		35.00	270	9,450.00	A worker will use a mask for 15 days with everyday washing
9.	Floor Cleaner (1 litre Can)	1.5 Can	N/A	3 Can	250.00	4.5	1,125.00	
10.	Detergent Cleaner	N/A	1.500 kg in each camp/month		400.00	13.50	5,400.00	To be used for washing clothes, masks and tools & equipment, etc.
11.	Miscellaneous cost				20,000.00	1	20,000.00	Contingency cost for medical emergency and compensation for workers, subject to proper documentation
	Grand Total						**90,475.00**	

Appendix-4: Elephant Migration Routes Map





Elephant presence map (latest information published by on 24 May 2018)

Appendix-5: Location Map of Sub-project component

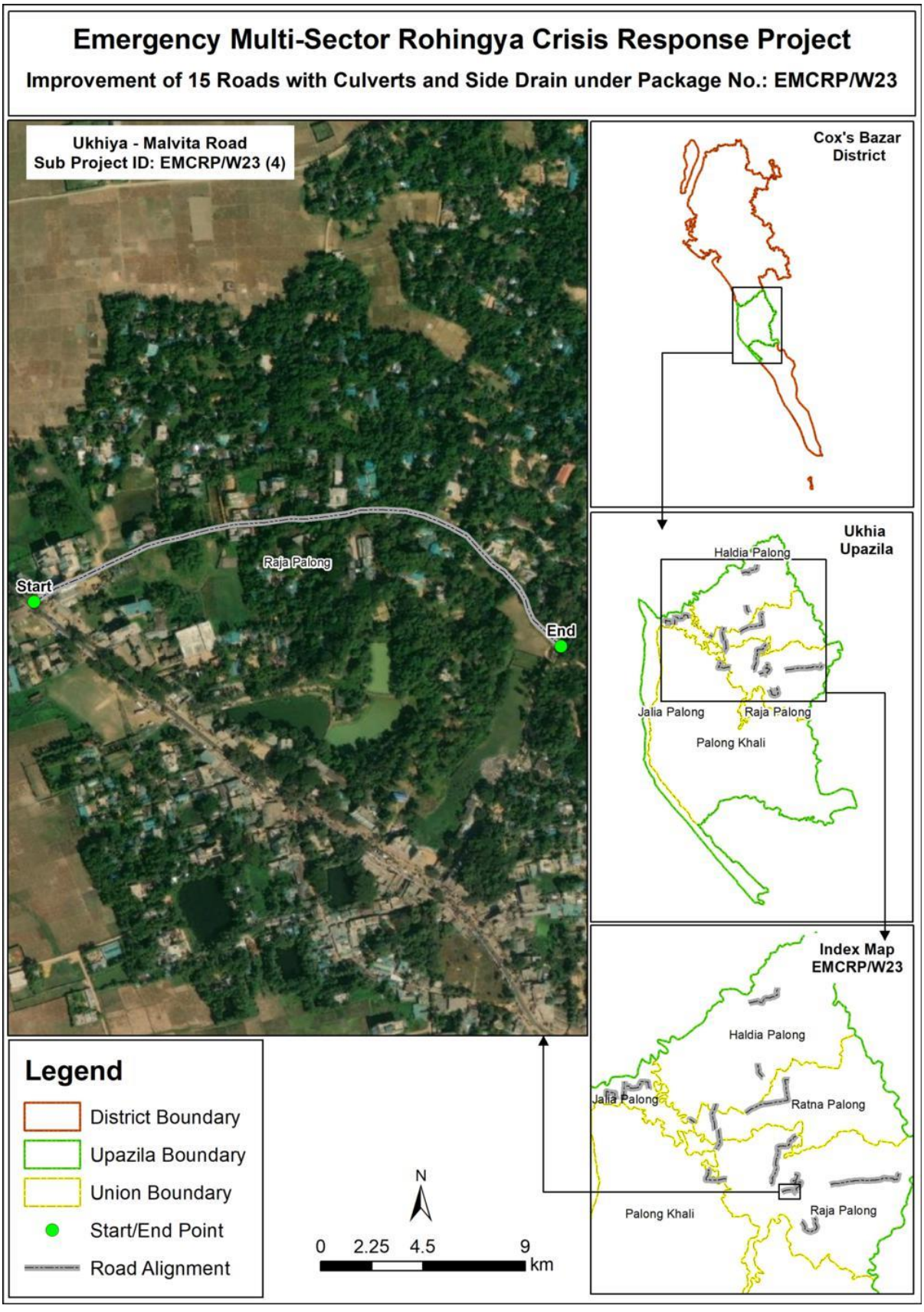
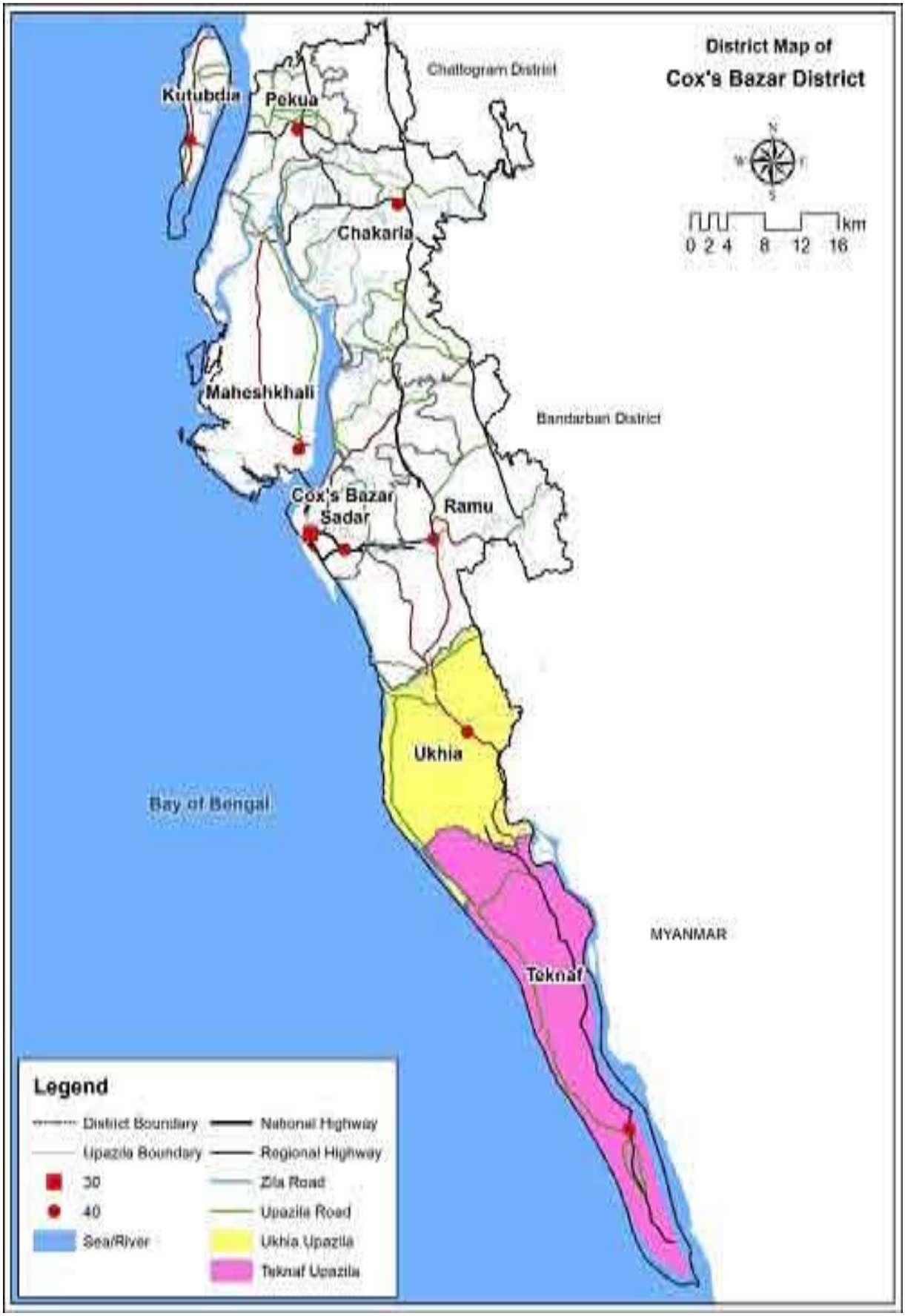
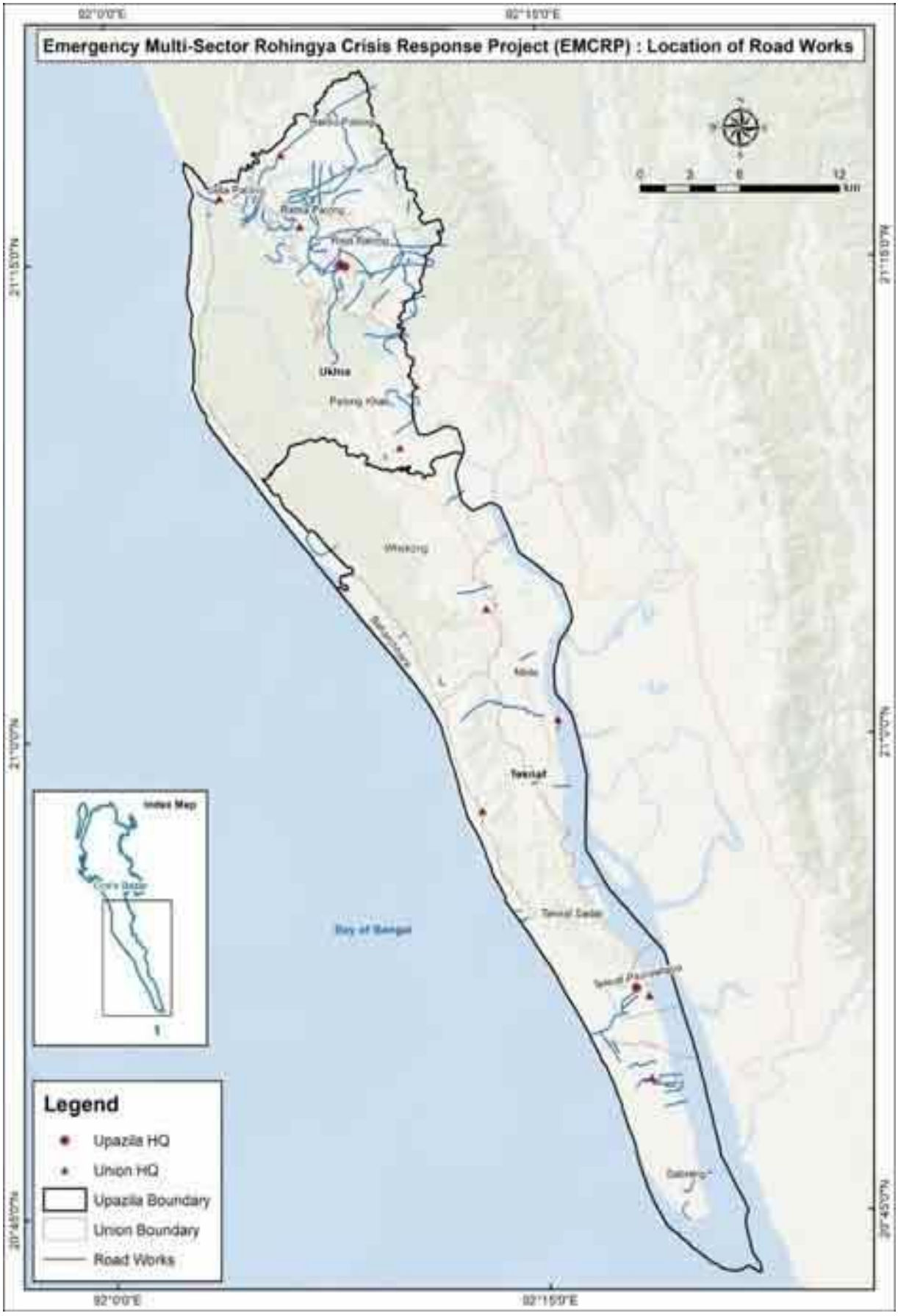


Figure: Location Map of W23-4



District map showing Ukhiya and Teknaf Upazila



Upazila map locating proposed roads

GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH
Ministry of Local Government, Rural Development and Co-operatives
Local Government Division
Local Government Engineering Department

Emergency Multi Sector Rohingya Crisis Response Project (EMCRP)

Project ID: P167762 **IDA Credit No. 5561-BD**





Environmental Screening Report

For Sonai chari Thingapara Road with culverts and side drain under Cox's Bazar District.

Under the package no. EMCRP/W23

Funded by:

THE WORLD BANK
IBRD • IDA

Government of the People's Republic of Bangladesh & World Bank

Design and Supervision Consultancy:

ddc Development Design Consultants Ltd.

October-2020

Contents

1. INTRODUCTION 1

1.1 Project background 1

1.2 Elementary information of Work Package Components of W23.5 2

1.3 Proposed intervention items of sub-projects 5

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS 5

2.1 Methodology 5

2.2 Important features/establishments within the PIA 6

2.3 Issues and Recommendations raised by the Participants in regards to component interventions for W23.5 8

3. ENVIRONMENTAL SCREENING 10

3.1 General 10

3.2 Major Findings 10

3.3 Climate Change Impact Screening 13

3.3.1 General Overview of the area 13

3.3.2 Site Specific Screening and outcome 14

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) 15

4.1 General 15

4.2 Health and Safety Measure under COVID Situation 17

4.3 Cost of Environmental Enhancement Works in BOQ 18

5. LIMITATION OF THIS STUDY 18

6. CONCLUSION AND RECOMMENDATIONS 18

Annexure-01: Important Environmental Features (IEFs) near site: 20

Annexure-02: Attendance of consultation meeting 21

Annexure-03: Pictures of sub-project component location and surrounding features with public consultation 22

Appendix-1: Environmental Screening Form for examining sub-projects 23

Appendix-2: Environmental and Social Management Plan (ESMP) 41

Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.5 49

Appendix-4: Elephant Migration Routes Map 55

Appendix-5: Location Map of Sub-project component 56

ACRONYMS

BOQ	Bill of Quantities
BFS	Brick Flat Soiling
D&SC	Design and Supervision Consultant
DoE	Department of Environment
DRP	Displaced Rohingya people
EA	Environmental Assessment
EC	Electrical Conductivity
EMCRP	Emergency Multi-Sector Rohingya Crisis Response Project
ESMP	Environmental and Social Management Plan
ERP	Emergency Response Plan
ESMF	Environmental and Social Management Framework
FDMN	Forcibly Displaced Myanmar National
FGD	Focus Group Discussion
FSM	Faecal Sludge Management
GBV	Gender Based violence
GPS	Government Primary School
GRM	Grievance Redress Mechanism
HBB	Herring Bone Bond
IEFs	Important Environmental Features
ISCG	Inter Sector Coordination Group
IUCN	International Union for Conservation of Nature
IWM	Institute of Water Modeling
LGED	Local Government Engineering Department
PIA	Project Influence Area
PIU	Project Implementation Unit
PMU	Project Management Unit
PPE	Personal Protective Equipment
PSC	Project Steering Committee
SMC	School Management Committee
SPM	Suspended Particulate Matter
SWM	Solid Waste Management
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
UNHCR	The United Nations High Commissioner for Refugees
VAT	Value-Added Tax
WB	World Band

1. INTRODUCTION

1.1 Project background

An estimated 730,000[1] people of Rohingya community has fled to neighboring Cox's Bazar district of Bangladesh since August 25, 2017 to escape extreme violence in Rakhine State of Myanmar, which caused the total number of Forcibly Displaced Myanmar National (FDMN) in the district to be about 923,033[2]. This huge number of displaced population account for about one-third of the total population of Cox's bazar, a district which was already facing many development challenges and suffering from resource-constrained social service delivery system even before the crisis evolved and the mass exodus of FDMN has worsened the situation further. Almost all of these displaced people are hosted in Ukhiya and Teknaf Upazila of Cox's Bazar, in extremely congested settlements in areas having very minimal access to basic infrastructure and services and is prone to natural disasters. The Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP) has been designed in order to reduce the vulnerability of Forcibly Displaced Myanmar National (FDMN) along with people from the host communities in Teknaf and Ukhiya Upazila under Cox's Bazar District, to different disasters and improve the social service delivery system and disaster resilience to both the communities. This project will follow a sustainable development pathway that is resilient to disaster and climate change effects.

The objective of the Project is to provide greater protection for the FDMN and host communities through:

- Reducing the vulnerability to natural disasters
- Improving social service delivery system and providing better communication facility through physical interventions
- Improving water and sanitation facilities
- Reducing vulnerability to accidental fire
- Provisioning better educational facilities and
- Strengthening and scaling up of GBV prevention services to the FDMN

The project is jointly being implemented by Local Government Engineering Department (LGED), Department of Public Health Engineering (DPHE) and Ministry of Disaster Management and Relief (MoDMR) under their respective mandate and scope of works. Apart from the interventions in Addressing Gender and Social Inclusiveness and Preventing Gender Based Violence with the Support from UNFPA and building Communication and Awareness among all affected parties through an effective engagement of BCCP (Bangladesh Center for Communication Programs) in the areas, LGED is implementing a good number of infrastructural facilities, namely improvement of hat bazars, roads (both inside and outside of the camps), bridges, culverts, construction of School cum multi-purpose disaster shelters, Satellite Fire Stations, Relief Distribution Center, Community Service Center and many other different types of facilities. Given the project interventions, sensitivity of the areas and volume of people in or around the sites, the project is more likely to trigger certain Operational Policies and Bank Procedures, namely Environmental Assessment (OP/BP 4.01), Natural Habitat (OP/BP 4.04), Forest (OP/BP 4.36) and Physical Cultural Resources (OP /BP 4.11).

[1] ISCG: Situation Report Rohingya Refugee Crisis, (September 27, 2018)
[2] IOM Needs and Population Monitoring round 12 as of October 10, 2018

1.2 Elementary information of Work Package Components of W23.5

It is imperative to recognize proposed components under Work Package-23.5 in Ukhiya Upazila in order to assess and verify its interventions according to stipulated screening requisites from WB. Acknowledging this matter, such details are accounted for as given below in Table 1.2.1 along with visual presentation (General Upazila Map) given in Figure 1.2.1. Aerial maps for each sub-project is given in Appendix -5.

Table 1.2.1: Basic Featured Information of components [Sources of data: Field survey, 2020: DDC & LGED]

COMPONENT'S NAME UNDER W-23.5	GPS COORDINATES	DISTANCE FROM UPAZILA HQ	UNION	WARD	LOCATIONS UNDER PROJECT INFLUENCE AREA	PRE-EXISTING CONDITION OF ROAD	PROPOSED ROAD TYPE	ROAD DIMENSION(M) (LENGTH X WIDTH) = FOOTPRINT (SQ.M) *
SONAI CHARI THINGAPARA ROAD ID:422945006	**Starting Point** 21.28421^0 N 92.07186^0 E **Ending Point** 21.29167^0 N 92.07246^0 E	10 km	Jaliapalong,	2	Dighirbeel, North Shonaichori, East Shonaichori, Lomboripara	Partly HBB (Broken), Partly Earthen	Bituminous Carpeting (BC)	(845mX 4.9m) = 4,140.5 Sq.m

*Note: Roads are proposed to have average carriage way of 3.7m with 0.6m shoulder on each side; special conditions may prompt further adjustments while in construction period. However, footprint for roads are calculated with an average of 4.9 meters.

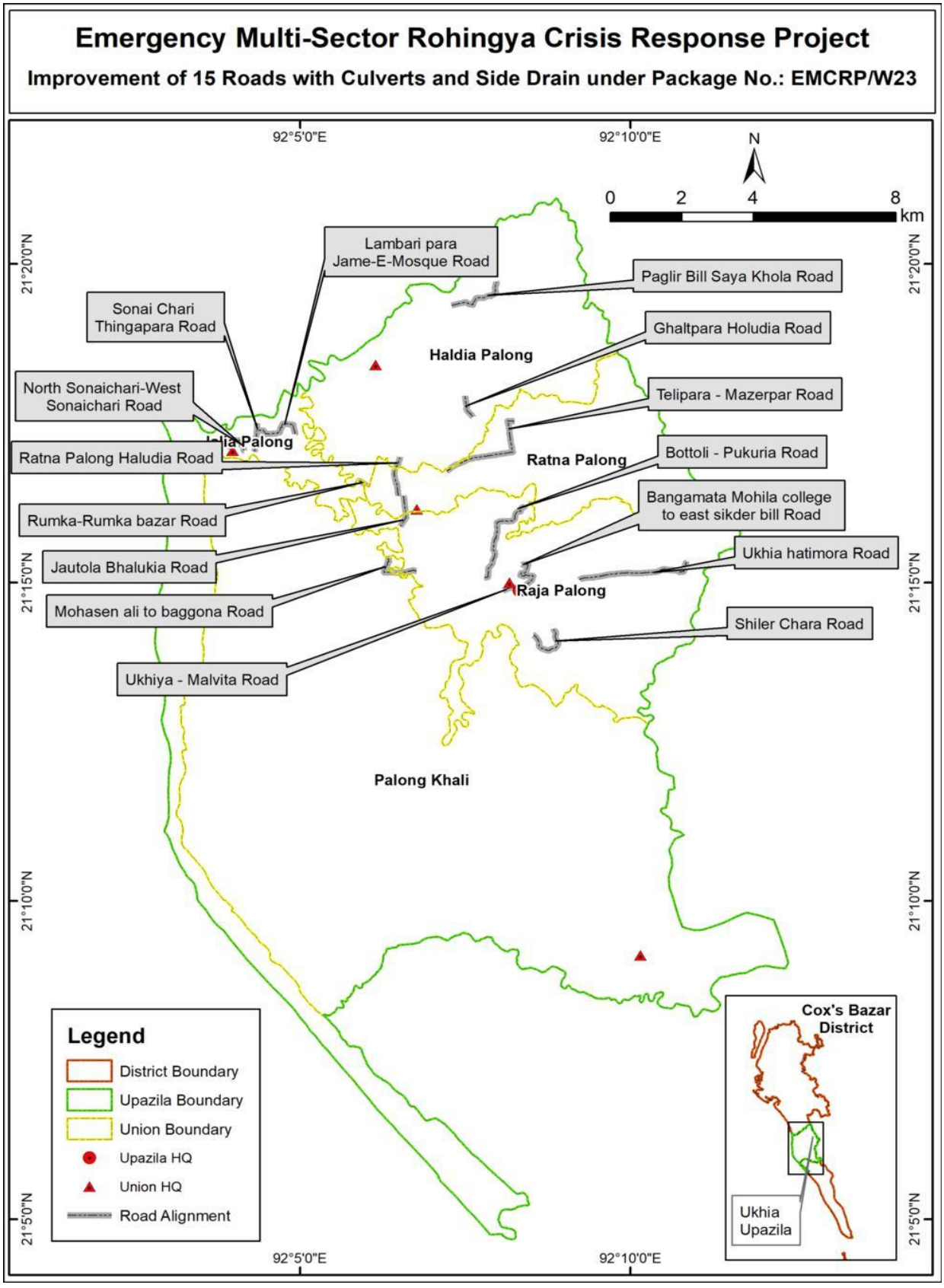


Figure 1.2.1: Map illustrating Roads of Work Package EMCRP/W23 locations in the Ukhiya Upazila

1.3 Proposed intervention items of sub-projects

The roads under work package W23.5 have been proposed with specific need basis dimensions to accommodate and ensure best quality interventions for local stakeholders. In context of governing environmental circumstances and geo-meteorological conditions, protection work items have been added to construction design for safety and sustainability of each proposed roads. These roads are abutting agriculture hence, construction and improvement works will descent these roads into new circumstances in some parts. These items have been included on the basis of field survey and analysis of these conditions. Please follow the table to acknowledge these items.

Table 1.3.1: Proposed safety interventions of each sub-project for W23.5

W23-5: Sonai chari Thingapara Road Id:422945006
24.0m Palisading wall and **646.0m Toe wall, Road safety** work and **Environmental Mitigation and Enhancement** works are also included. Description of safety works and environmental enhancement works can be found in BOQ attached in Appendix-03.

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS

2.1 Methodology

Public participation and community consultation have been taken up as an integral part of environmental assessment process of the project. As part of the impact assessment, participatory public consultation was conducted in areas of concern for proposed road by the field level staffs and consultants from PIU and D&SC. The consultation meeting was attended by disparate social groups representing local habitants, separate age groups, social class and occupations. In some cases, IUCN employees in charge of elephant watch tower were present where frequent elephant movements occur. The participants were also selected from different segments of stakeholders, and some of whom will have major active roles before, during and even after the construction works. Therefore, the meeting was organized in an informed, expressive and unbiased manner, wherefrom different views and concerns came across which will be properly taken care of during the design and construction phases. In order to serve our screening process, relevant items were thrown towards the audience to discuss and troubleshoot confusing or worrying matters regarding the proposed intervention under package work. Impacts in regards to environment, socio-economic matters during pre-construction, construction and post construction phase has been put forth. Possible mitigation measures and relevant needs have turned out during these sessions as well. Moreover, their comprehension as a stakeholder has been up lifted in light of project guidelines.

However, public consultation is a living process as the types of problems/ difficulties, involved parties or stakeholders and mode of settlement or resolution processes are more likely to differ with time. Thus, consultation with different parties or stakeholders will be continued throughout the sub-project implementation period and records of resolutions, whatsoever and wherever possible, will be kept in writing at the site and made available on any enquiries or requests by all parties concerned.

All components under the work package have been put through review for locating impediments or possible adversity effecting future environment and socio-economic conditions. In order to comprehend surrounding features and impacts which may stipulate with it, screening has acknowledged having a Project Influence Area (PIA) of 0.5-kilometer radius. Sensitive findings have been identified if any, and relevant mitigation or minimization measures were suggested to subdue such complication for over the project construciton period. Moreover, evaluation was inspired to enhance environmental features and include monitoring initiatives under ESMP budget to ensure exertion of environmental improvement propositions. Contractor's responsibility has been taken into account while identifying possible impacts through sets of intervention accounts. These steps have been initiated strictly following ESMF guidelines and requirements. Environmental screening procedure was motivated by ingredients highlighted in Appendix-2 of ESMF. During survey, detail chainage length of the sub-projects was taken into account for detailing environmental and socio-cultural features within 100 meters buffer zone of both Left and Right side from the center line of the road. Longitudinal intervals of 300 meters have helped to identify positions of sensitive or near-sensitive socio-cutural features. These findings are illustrated in **Annexure-01**.

2.2 Important features/establishments within the PIA

Initial screening process is conducted through direct involvement of PIU and D&SC in the influence area of the proposed component, which allows to raise significant questions and ideas towards participants. In combination of both field walk-through and inputs of audience, a register of existing features is formed. Allow the following table to describe such elements in all the work package components.

Table 2.2.1: Important features within Project Influence Area for W23.5

Component's name under W-23.5	Direction	Important features/ establishment (approx. distance from the proposed site)
Sonai chari Thingapara Road Id:422945006	North	Baitur Rahman Jame Mosque (300m, reju khal (10m)
	South	Shonaichori GPS (50m), Jalipalong Baitur Sarak Mosque & Hefzokhana(80m)
	East	Hazrat Ayesha Siddique Balika Madrassa(50m), lomboripara GPS(1km), Shoudagorpara Madrassa(1km), Hazrat Ayesha Mosque (50m), pond (300m)
	West	Shonaichori Jame Mosque/ Madrassa/Hefzokhana (200m), Jaliapalong High School(100m), Shonaichori GPS (200m)

2.3 Issues and Recommendations raised by the Participants in regards to component interventions for W23.5

After inauguration has set in motion, their valuable opinions and remarks came pouring out. At this point, we find our field base knowledge for assessment attributed impact degrees and possibilities. Please follow the table 2.3.1 given below to recognize participants' inputs arranged in relevance with this component. Consultation meeting summary, attendance sheets and pictures of separate meetings with proposed location for this sub-project component can be found in Table 2.3.2 and Annexure-02 and Annexure-03 respectively.

Table 2.3.1: Issues and Recommendations raised by the Participants

COMPONENT'S NAME UNDER W-23.5	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
SONAI CHARI THINGAPARA ROAD ID:422945006	•They are very much concerned with absence of reliable path route in Dighirbeel, North Shonaichori, East Shonaichori, Lomboripara villages area. •Lack of proper and strong road keeps motor vehicles from accessing these locations. • In case of emergency conditions such as ambulance services cannot reach these locations. • Heavy transports are prone to accidents due to bad road conditions. •Possible dust and noise pollution during the construction works should be considered. •Safety of children and adults at the sites during construction works. •Elephant movement is not present. •Local community wish to have a better drainage system along with the road in order to allow waters from undulated terrains to find an uninterrupted pathway not causing harm to agriculture fields and wash away top soil of adjacent grounds residing alongside the road. It will protect the top soil for future growth of crops and aid vegetable farming.	•Local people considered that the selected site is suitable for the construction of this road from both the technical and social-environmental (direct savings in the cost of operating vehicles, time savings by travelers and freight, wider effects can less accident rates, road being waterproof and dust free, much more durable) point of view. It will provide better mobility and access to services in due time. •Enough pathway is expected for vehicle movement so that comfort travel is achieved. •Construction site safety should be ensured to avoid any mishaps or accidents during work periods. •They considered moderate amount of lumbering and suggested tree plantation initiatives. •They also requested to involve the local community to construction work and they will welcome any outside key labor. •During construction period, alternate route to pass through this area is available. •Since the road is passing alongside homestead gardens and agriculture fields, the intervention will invite air pollution on moderate level during construction period. However, preventive actions and measures can be taken to keep air quality from degrading. • Women should be recruited equally, wherever possible. •Participants, made certain that they will provide surveillance over raw materials and material storage area. •They have also ascertained that the selected site is free from any events related to

COMPONENT'S NAME UNDER W-23.5	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
	•The participants have expressed their greater interest for this intervention and believes this will bring nothing but prosperity for the entire catchment dwellers. •Household boundary fences along the road should not be affected while construction • No trees should be harmed for preparation of this road • Available pathway to usher material delivering vehicles • Labor shed availability in the target location was discussed • Identification of material storage was discussed	resettlement and major environmental impacts. The adverse environmental impacts that may come in the way of air quality, noise, solid waste, occupational health & safety during the construction period, and will be of short duration, yet proper management/conservative options should be adopted. • An access point called Sonarpara Saikat Road is available for access of material delivering vehicles. •Open space near sub-project side can be used as labor shed and material storage space. •Intervention should consider necessary preparations and mitigation measures so that this water stream is not restrained in any form. Among chainage 600m to 800m, water logging is a problem. Locals have suggested to keep this segment in consideration while preparing the road.

Table 2.3.2: Consultation Meetings Summary

Road Package Number	Date DD-MM-YYYY	Venue	Main Participant Groups	No. of Participants	Remarks (If any)
W23-5	05-10-2020	Adjacent to Sonaichori road	Host Community	17	The local individuals, elites, chairman and/or member of respective Union Parishad, representatives from different agencies participated in those consultation events.

3. ENVIRONMENTAL SCREENING

3.1 General

This section identifies the potential impacts that the various elements of the proposed Project may have on the physical, biological and socio-economic environment within half a kilometer of the radial distance around the site. Environmental Assessment (EA) based on this screening study for the Sub-project has been conducted to identify and determine which potential Project impacts may be significant and therefore require the application of reasonable and effective management and/or mitigation measures.

In order to realize the exact physical, biological, socio-economic and environmental impacts of the proposed sub-project sites and the influence area in regards to the implementation measures, an extensive field visit was carried out in each proposed sub-project PIA. Environmental Screening form, as adopted in **Appendix 2** of the Environmental and Social Management Framework of EMCRP, was administered for identifying the impacts and their extents.

The screening data and information for this sub-project component and details screening summary have been formulated and shown in **Appendix-01.**

3.2 Major Findings

A complete view of current environmental conditions of individual sub-projects in relation to interested queries has been congregated in order to understand the degree of impacts corresponding with marked interventions. Interestingly, most sub-project has correspondence with its surrounding features and upholds interchangeable impacts. However, the degree is not an interchangeable factor since scale is not parallel to each of these components which is where, mitigation measure differentiation is implied. There are some cases where unique circumstances have been met with while environmental screening took place which is also accounted for and should be a matter of concern for other parts of the ESMF initiative. The significant issues observed this sub-project component is enlisted in following Table 3.2.1 with pertaining impacts. Moreover, impacts that are adventitious has also been embraced for promoting best practices.

Table 3.2.1: Concerning environmental issues relating to each proposed subproject and influence area for W23.5

COMPONENT'S NAME UNDER W-23.5	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
SONAI CHARI THINGAPARA ROAD ID:422945006	It is not located within any major environmentally sensitive area.	It will not cause any severe negative effects to the environmental settings of the area neither to important environmental features.
	Construction period will induce air pollution while preparing for bitumen and loading-unloading raw materials. Impacts on air quality during the construction phase may turn to negative. The main impacts include dust generation from crushers, vehicles and the transportation of all types of construction materials.	It will invite waste production which may in turn cause minor air pollution due to deposited dust and airborne particles less than PM_{10}. Dust pollution may slightly suffocate photosynthesis however this can be minimized through regular water sprinkling as suggested in ESMP.
	Noise emission from construction machineries and equipment can cause nuisance to local residents and workers.	The ambient noise level might have potential to increase temporarily and intermittently in the close vicinity of active construction fronts.
	No agriculture, fish farming and significant vegetation coverage is located in the ROW nor does it stand over such items. Nonetheless agriculture fields and homestead gardens/forest are found beside the road.	No agriculture land or any forest coverage will get degraded or lost for construction. Liquid waste such as left-over oils or chemicals might run into these adjacent features.
	Construction works will involve chemical usage and preparation of on-site add-ons to the road. Generating scraps and residues.	The runoff from work site may enter existing pond and frustrate the water quality which will be acute however.
	Few amounts of bush (sapling) will be cut down during construction phase at different chainage.	No severe damage will occur or damage to habitat will be faced. It can be managed by introducing small plantation incentives around the proposed location.
	Elephant Movement is not present in the vicinity of the subproject location.	No impact is expected
	No heavy earth excavation work will be involved.	Consequently air, noise and dust pollution will be occurred within a small-scale during construction period only.
	Construction related activities and setting up of labor camps along with associated facilities and their management can cause adverse impacts.	Noise pollution from pilling or drilling, air pollution caused by dust or gaseous emissions from vehicle movement, running of motorized equipment and land clearing, odors and soil pollution from leaking of latrines and fecal sludge, will more likely to take place.
	Chemical spills or improper disposal of construction waste materials due to lack of worker training and misconduct of contractor's safety initiatives.	During the construction period, soil may get contaminated from activities such as handling of hazardous construction materials (such as fuel, lubricants, paints, and solid waste and sewage).

COMPONENT'S NAME UNDER W-23.5	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
	Vibration effects generated from pilling, drilling or other construction works	Any vibration would result in nuisance effects to nearby faunal species, and but will be localized and temporary and will unlikely to result in structural damages to buildings or walls of the adjacent private properties.
	Sensitive environmental, cultural, archaeological, religious sites within 1 kilometer of site includes including Baitur Rahman Jame Mosque (300m) and Reju khal (10m) to the North. Shonaichori GPS (50m), Jalipalong Baitur Sarak Mosque & Hefzokhana(80m) to the south. Hazrat Ayesha Siddique Balika Madrassa(50m), lomboripara GPS(1km), Shoudagorpara Madrassa(1km), Hazrat Ayesha Mosque (50m) and a pond (300m) to the east and Shonaichori Jame Mosque/ Madrassa/Hefzokhana (200m), Jaliapalong High School(100m), Shonaichori GPS (200m) to the west.	No disturbance to all these establishments/features is anticipated due to construction activities for the sufficient distance from the construction site, and strict construction site management system- including restrictive work schedule during the daytime only, water-sprinkling twice a day on and around the site, safe storage of materials, etc.

A few incidents of human elephant conflict have been reported in 2018. The IUCN has conducted a study on such conflict. With the support from UNHCR, IUCN has been marking elephant routs and corridors and informing local communities and stakeholders of avoiding the marked areas. As part of the mitigation options, different initiatives have been undertaken, such as formation and capacity development of Elephant Response Teams (ERTs); providing equipment to ERTs to divert in-coming elephants; and setting up elephant deterrent tools (e.g. trip alarms and watch-towers). Though the current chances of occurrence of conflicting incidence are zero, any recurrence would be managed by the ERTs and they will be called if there appears any minute possibility to recur. A map of elephant movement is given in Annexure 04.

In order to offset the loss or attenuating the environmental degradation, a set of mitigation measures will be adopted, on top of general practice of standard construction procedure or following the relevant codes of practices.

3.3 Climate Change Impact Screening

3.3.1 General Overview of the area

Cox's Bazar is one of the coastal districts of Bangladesh and is prone to the effects of climate change due to its geomorphological siting and climate induced effects. The hilly tracts of Cox's Bazar could foster further environmental crisis brought on by indiscriminate deforestation and diminishing groundwater reservoirs, which have been taken place in recent months as the Rohingya crisis evolved. A recent study conducted by World Bank[3] has found that Cox's Bazar will be the worst-hit district in South Asia as average temperatures rise and rainfall patterns become disruptive, by 2050, if greenhouse gas emissions continue unabated.

The hilly region of the country, especially the part in Cox's Bazar is characteristically of muddy soil structure, not of any rocky formation and the stability comes from the roots of the trees. Also rainfall, proximity to the sea, elevation, and land cover are very important factors for analyzing the risk of cyclone. Denudation of trees from hilltops in order for the huge settlement of Rohingya people has already increased the vulnerability to the risk of hill collapse by destabilizing the terrain. Also deforestation at a rapid speed uncovers the land and raise the risk of occurrence of cyclones, as forests protect land from high wind and storm surges where demolishing the trees would make the area vulnerable.

Together with the above-mentioned hazardous situation, again due to sudden extraction of huge amount of groundwater, availability of potable water from shallow tube wells that pump water up from about 150 feet has already reached to a critical level. Averting the problem requires new tube wells to be plumbing deeper into the poorly mapped aquifer, but going deeper than 700 feet in some places may cause salt water to contaminate freshwater resources.

In this case, it is possible that a stationary position of the freshwater-saltwater transition zone can be established via proper management of pumping in the confined aquifer.

The groundwater resource is seen to suffer more from the climate change impact. The impact on groundwater due to climate change impact include

- Sea-level rise could result in a transgression of the sea and a loss of land area. This could also lead to the secondary effect of population migration in the new coastal band due to migration of the coastal population from the encroaching sea, thereby increasing domestic water needs in the new coastal area.

- Transgression of the coast implies that saline storm surges of 1 or more meters depth would penetrate beyond the new coast to new land areas. Storm surges transport saline water far inland of the coast and much of this floodwater may infiltrate the ground in areas where the aquifer is not fully saturated. Even where the aquifer is saturated, denser saline water may

[3] https://openknowledge.worldbank.org/bitstream/handle/10986/28723/9781464811555.pdf

sink into the aquifer during the flood and later from pools of saltwater that remain following the flood[4].

- It has been identified that the salinity is found in the shallow aquifers along the coastline. So the salinity which are found in the groundwater are of lesser concern as salinity will subside over time

- Several researches show that through modeling of groundwater flow that the depletion of groundwater in the host community will persist up until 2022 and the replenishment of water will take place.

Considering the general climate change effects in Cox's Bazar area and offsetting the aggravating environmental situation due to the mass arrival of Rohingya communities, several specific measures including tree planation in sub-project areas, rainwater harvesting from every disaster shelter, construction of drainage facilities along the road length and installing thunder arrester across the areas, have been suggested and will be implemented.

3.3.2 Site Specific Screening and outcome

Climate Change impact on a particular subproject is tough to deduce as the highest resolution of climate model simulation done over Bangladesh is 50km. Depending on the simulation ensemble of Cox's Bazar district, the temperature and precipitation are likely to increase with time.

Site specific climate change impacts are often not so easy to measure or deduce plausibly while the site is confined to a narrow strip of roadways, and associated mitigation or offsetting measures are really hard to plot on the impact areas, though an overall set of measures are often considered in practical aspect. Fig:1 shows the inundation risk map of the subprojects under W-23, none of the subprojects are in vicinity of the severe river flood inundation area. So the risk of flooding is low around the sub-project area

[4] "Implications of Climate Change for Fresh Groundwater Resources in Coastal Aquifers in Bangladesh", World Bank report.2010

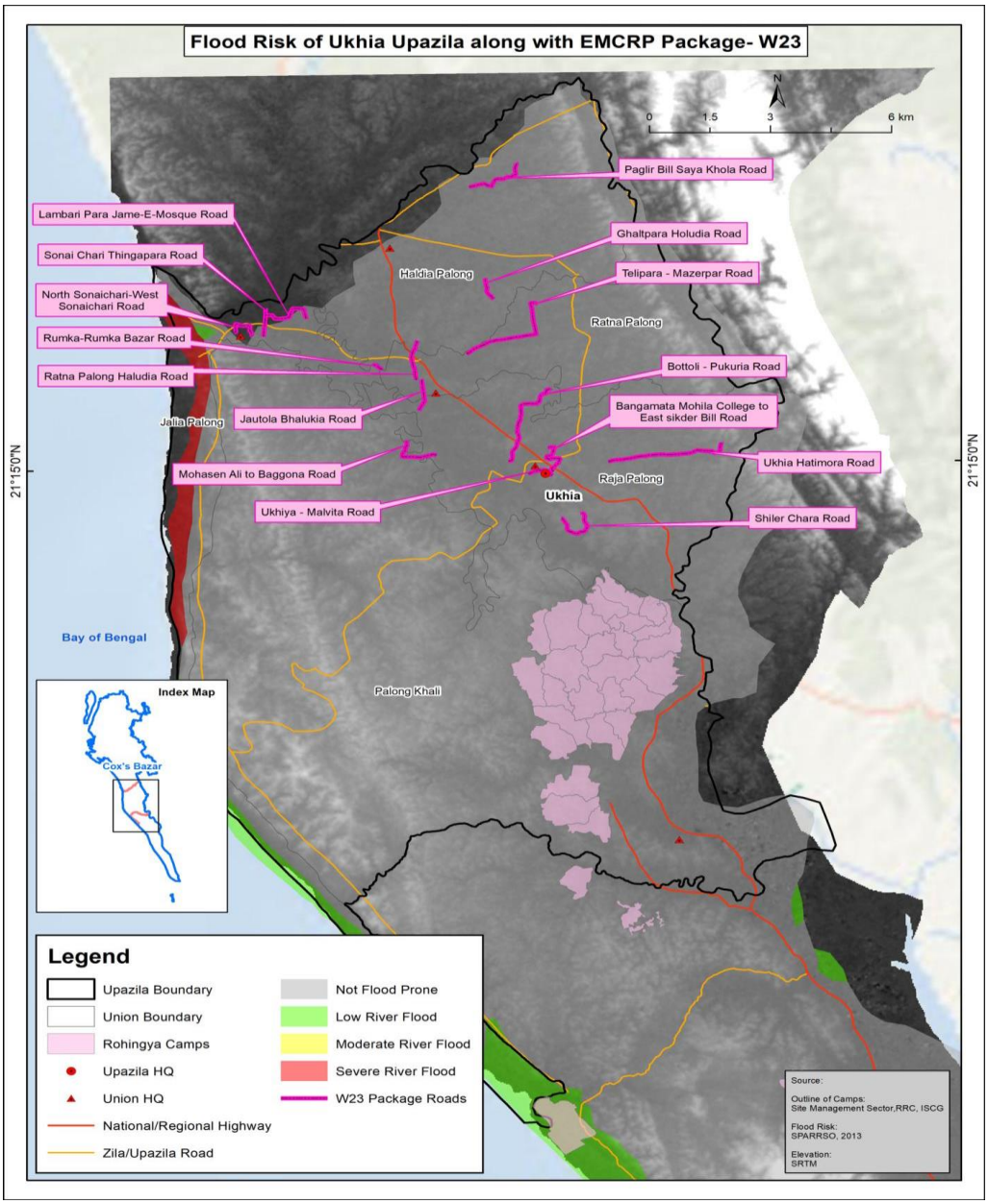


Figure 3.3.2.1: Flood inundation risk map near the subprojects.

Also, in order to avoid the devastation caused by the thunderstorm, state-of the-art thunder arrester (lightning protection system) has been suggested to install having a coverage area of 25,434 sq.m for a single arrester. In addition, tree planation on the road slope/ within the premises is also suggested to sooth the temperature effect and increase the water retaining capacity of soil, at the same time.

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

4.1 General

Considering the environmental settings of the sub-project area, it can be assumed that possible impacts would be largely construction-related, and could be addressed through adoption of good engineering practices; good housekeeping; better *in-situ* construction materials management; and observance of health and safety protocols during the implementation period.

Table 4.1.1: Site Specific Impact and Mitigation Plan under package W23

Component's name under W-23.5	Impacts	Mitigation plan
Sonai chari Thingapara Road Id:422945006	To the north Reju khal (10m), To the south Shonaichori GPS (50m), Jalipalong Baitur Sarak Mosque & Hefzokhana(80m). To the east Hazrat Ayesha Siddique Balika Madrassa(50m), Hazrat Ayesha Mosque (50m).	Contractor must adhere to the best practice debris management procedure and regular adoption of dust control measures (spraying of water at least twice a day) to minimize the effect to the level best.
	Some part of the proposed road is passing by the agricultural land. Some low land is found beside the proposed road so **palisading wall** will be constructed during construction period for used to "correct" the natural slope. There are points on the road where slope preparation cannot be done due to having low lying agriculture lands and water bodies. Slope preparation refers to resettlement issues as well in those locations. In such cases **Toe Wall** is proposed which helps to restrain the horizontal surface pressure. This is an adaptation technique and a precaution measure to not allow any damage to sideline existing low-lying features. There are low lands along the road where agriculture fields and ponds are present. This also excludes high chance of soil quality degradation.	**24.0m Palisading wall** and **646.0m Toe wall, Road safety** work and **Environmental Mitigation and Enhancement** works are also included.

Further construction related activities which may result in adverse impacts in the surrounding environment of the sub project component must be kept under close consideration and appropriate mitigation and management measures will be taken with due care and vigilance. Once the effects are minimized to its least level and controlled efficiently, it will turn into a welcoming and beneficial project for the local communities. The specific environmental management plans have been outlined in **Appendix-2**. The mitigation measures as well as monitoring program of ESMP have also been incorporated in the management plan.

Environmental quality enhancement: Under the additional financing to the EMCRP project, Forest Department of the Government of Bangladesh will afforest along 200 km of road length area, primarily under the Ukhiya and Teknaf Upazila of Cox's Bazar district in order to offset the environmental and ecological devastation, that had been occurred due to the evolution of Rohingya Crisis, to an achievable level. Many of these road lengths will go through and by the Rohingya Camps, up on the hill and are already denuded of trees or vegetation. Local Government Engineering Department (LGED) will allocate and channelize the finance to the Forest Department under the said additional financing component and oversee the progress of works with due diligence. However, this enhancement work will improve the environmental quality of the area and reinstate some parts of the ecosystem services to those areas, though primarily.

4.2 Health and Safety Measure under COVID Situation

Apart from the established Occupational Health and Safety (OHS) measures being followed in construction sites, offices, and labor camps, a set of additional measures has to be taken and practiced throughout the daily cycle by each labor, staff and any involved parties, due to the ongoing pandemic coronavirus situation. Staffs and consultants at PIU and D&S, along with the pool of consultants under different firms/agencies for different services, and all the representatives or staffs of construction contractors and suppliers have to play much sensitive, (pro-) active and responsible roles in abiding by the rules and measures by themselves and getting the involved workers and different stakeholders adhered to the same. A detailed guideline containing a set of measures with shared responsibilities has been sketched out in order to fight the exposure and further spread of this potentially fatal situation. This plan or guideline shall constitute an integral part of ESMP measures for every sub-project, though is not included in this report to keep it concise and specific, and the contractor is required to keep the copy of that guideline at every site office.

However, among many other relevant issues, the guidelines emphasize on following line of directives:

a. Contractor must designate one of his employees as H&S/Safeguards supervisor to lead, coordinate and interface in order to fight the COVID 19 situation under the direct guidance of COVID focal at PIU of EMCRP project.
b. All workers, supervising and supporting engineers and staffs, consultants, service providers and other concerned parties must adhere to the personal health and hygiene rules, social distancing, and other protective measures in full in order to protect themselves and contain the infections any further. Necessary training and awareness campaign will be aligned with the specific sub-project scenario and prevailing conditions.
c. General practice of cleaning and hygiene has to be maintained in all project/site offices and camp sites, and supply of necessary PPEs and cleaning /disinfecting materials along with proper use of those is to be ensured.
d. Public consultation and stakeholder engagement are to be carried out considering the prevailing risks of virus transmission in the target areas, scope of interventions and level of ICT penetrations among the target stakeholders, and so on.
e. Necessary protocols have to be established and maintained in case of handling a sick employee or worker, and appropriate compensation to a sick disengaged labor is required to be given with due documentation.
f. Budgeting for suggested protective measures, along with necessary supervision and monitoring for the required interventions has to be ensured.

Following the additional health and safety measures presented in that guideline, sub-project component specific BOQ items have been inserted to supplement the budget considering the country-specific situation, capacities, and scope of interventions. The additional cost to Health and Safety Measures under COVID 19 situation is shown in **Appendix-3.**

4.3 Cost of Environmental Enhancement Works in BOQ

In consideration to the above-mentioned environmental impacts and their mitigation measures for this sub-project component, a set of items are included in the BOQ of this sub-project component. Social Safeguard Personnel for Environmental and Social Management for Work Package EMCRP/W23 has also been added in the whole BOQ in order to take supervision and leadership to organize Environmental Management under Environmental Enhancement Works. The total costing and estimation have included enhancements such as Grass turfing plans, Tree plantation initiatives, Dust Suppression mechanisms. On the other hand, in order to ensure health safety and sanitary measures of workers PPE, First Aid Box, Labor shed, Environmental management, drinking water facility with water tests, Temporary latrine for both male and female as well as waste disposal systems has been accounted for. Ensuring sustainable labor performance in regards to environmental and social considerations motivational training has been taken into account. An overview of the estimation is given below and the detailed estimated cost to implement the ESMP is shown in **Appendix-3**.

5. LIMITATION OF THIS STUDY

Bangladesh government has imposed a nationwide lockdown to curb the spread of the novel coronavirus in the wake of series of deaths and infections. Authorities declared a ban on passenger travel on all sector from March 24 while all public transport on roads have been suspended from March 26 to stem the spread of virus, officially known as COVID-19. All office works have been postponed and an intended visit to the sites for further consultation with the relevant stakeholders has had to cancel due to this crisis. Therefore, some relevant information and arrangement needs awaiting for recovering this pandemic crisis.

6. CONCLUSION AND RECOMMENDATIONS

The overall conclusion is that if the mitigation, compensation and enhancement measures are implemented in full, there will be no significant negative environmental impacts in regards to the selection of location, design, construction, and/or operation procedure of the proposed Sub-project. There will in fact be tremendous benefits from recommended mitigation and enhancement measures and major improvements in quality of life, opportunities in business, trading jobs and ensuring social safety and security will be achieved once the scheme is in operation.

The conclusions of the Screening study can be summarized as follows:

- The communities will receive large benefits through improved infrastructural facilities, transportation & communication etc.
- The short-term negative impacts that may come by the way of air quality, noise, solid waste, occupational health & safety need to be minimized through the management plan.
- The project will create employment for those who live in the vicinity of the construction site and will provide them a short-term economic gain.
- The green belt development, if necessary, for the road site, with large-growing trees at the periphery of the site will give the places a more natural and pleasing appearance.
- A comprehensive Environmental and Social Management Plan (ESMP) has been prepared to mitigate and reduce the adverse impacts that will come out from the Subproject activities.

Implementation of this Sub-project will have large positive impacts to the communities in terms of improved infrastructural transportation & communication facilities, which would eventually develop the socio-economic condition of the catchment areas. So, strong recommendation should be put in place to implement the sub-project within shortest possible period of time, and with great care and efficiency.

Annexure-01: Important Environmental Features (IEFs) near site:

Detail Environmental features within 100m of the both sides from the center line were collected @300m longitudinal intervals. The findings of the survey for the aforementioned road can be seen in the table below:

Table: Detailed Chainage length and feature of the Sub-Project component

Road Name	W23-5: Sonai chari Thingapara Road Id:422945006 **(W23-5)**	**Total Chainage**	850.0m

Chainage (m)	**Left**	**Right**	**Features**
000-300	L		Agriculture field, nut garden, wired fence with RCC Pole, Agriculture field, household, nut tree garden, trees, household connecting road to the left, household, agriculture fields, garden, household tree, bamboo fence, tree
		R	Agriculture field, brick wall, household, Agriculture field, household connecting road to the right, crop field, garden, bush, bamboofence, household, tree
300-600	L		Brick wall, household, vegetable yard, household connecting road to the left, crop field, Mosque (shonaichori mosque), crop field, culvert, crop field
		R	Bush, crop field, bamboo fence, household, crop field, electric pole, tin fence, tin fence, tree, shop, tree, garden, crop field, tree crop field
600-850	L		Household connecting road to the left, tree, household, garden, bamboo fence, shop, nut tree, household, bamboo fence, vegetable yard, crop field, salt field
		R	Crop field, shop, nut tree, household, bamboo fence, household to the right, crop field, the road ends near Rejur khal

Annexure-02: Attendance of consultation meeting

EMCRP/23.5

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)

Local Government Engineering Department (LGED)

Public Consultation Participants List

Focus Group Discussion

সময়: 6:45 PM তারিখ: 05/10/2020

উপ-প্রকল্প/কার্যক্রমের নাম: Sonaichani Thingapara Road

যে স্থানের জন্য: Adjacent to Sonaichani Road

ইউনিয়ন: Jaliapalong ওয়ার্ড নং: 02 মৌজা: Inani উপজেলা: Ukhiya জেলা: কক্সবাজার

সভা পরিচালনা করেন:

অংশগ্রহণকারীদের তালিকা (পরিচয় ও স্বাক্ষর)

ক্রম নং	নাম	বয়স	পুরুষ/মহিলা	গ্রাম	স্বাক্ষর / টিপসই
০১	মোঃ নুরুল আবসার	৫৬	পুরুষ	সোনাইচরি	
০২	মোঃ আবুল কাশেম	৬২	”	সোনাইচরি	
০৩	মোঃ ইয়াছিন ঈদ্রিস	২১	”	সোনাইচরি	
০৪	মোঃ আবেদ ঈদ্রিস	২৩	”	সোনাইচরি	
০৫	মোঃ তাজুল ইসলাম চৌধুরী	৩৫	”	সোনাইচরি	
০৬	মুহাম্মদ	৩০	”	সোনাইচরি	
০৭	মোঃ মোবারক	৭০	”	সোনাইচরি	
০৮	মুহাম্মদ আবিদুর রহমান চৌধুরী মোবারক, সাবেক চেয়ারম্যান	৫২	”	পালাংখালী	
০৯	আবেদার	২৫	মহিলা	সোনাইচরি	
১০	আবুল কাশেম	৬৮	পুরুষ	সোনাইচরি	
১১	নুর ছৈয়দ মোবারক	৬০	”	সোনাইচরি	
১২	সাদেকুর	২৫	”	সোনাইচরি	
১৩	মোহাম্মদ	৪০	পুরুষ	সোনাইচরি	
১৪	আবুল কাশেম	৭৫	পুরুষ	সোনাইচরি	
১৫	আবুল হোসাইন	৭০	পুরুষ	সোনাইচরি	
১৬	আবুল মুক্তার	৪০	পুরুষ	সোনাইচরি	
১৭	আবেদ	২৫	মহিলা	সোনাইচরি	

Figure: Attendance of consultation meeting for W23-5

Annexure-03: Pictures of sub-project component location and surrounding features with public consultation



Figures: Present condition of Sonai chari Thingapara Road (W23-5) & Public Consultation meeting with Host community

Appendix-1: Environmental Screening Form for examining sub-projects

Environmental Screening Form for Sub-project W23-5

Sub-Project Description Form:

EMCRP/W23- Improvement of 15 roads and construction of culverts with side drains under Cox's Bazar District

Name of Sub-Project: Sonai chari Thingapara Road Id:422945006

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Estimated total cost of sub-project (in Taka): 417,036,298.10 Tk.

Estimated construction period duration: 1 year

Estimated total cost of the component (in Taka): **17,560,378.77**

Estimated Operation and Maintenance period (life of sub-project): Project design life more than 15 (Fifteen) years but Government policies on how long projects can operate in the camps.

District: Cox's Bazar **Sub-District**: Ukhiya **Union**: Jaliapalong

Name of Community/Local Area: Dighirbeel, North Shonaichori, East Shonaichori, Lomboripara

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):

The Sub-Project is categorized as a village road-A with a proposed design of Bituminous Carpeting through construction of Earth Work. Interventions include **24.0m Palisading wall and 646.0m Toe wall**. **Road safety** work and **Environmental Mitigation and Enhancement** works are also included. Road safety works are also included in the project activity.
Estimated footprint / land area for this sub-project is 4,140.5 sq. meter

Brief description of sub-project site: (e.g. present land use, Important Environmental Features (IEFs) near site, etc.:

Proposed road is situated within the catchment area of Dighirbeel, North Shonaichori, East Shonaichori, Lomboripara stretching 850 meters. This road starts in Shonaichori from Sonarpara Shaikat road and ends in toingokhada near rejur khal. Being one of the local communities of Ukhia upazila these locations are very familiar to any other part of rural Bangladesh having mosques, village households, agriculture fields to grow crops and vegetation that serves as subsistent gardening. The surrounding area is dominated with agriculture practices as rice production, betel leaf production, vegetable farming etc. Majority of the surrounding space of this intervention is covered with homestead gardens and forests. However, there are no significant eco-sensitive features on the pathway of this proposed road.

Overall Comments

The proposed component of the sub-project (Road construction) is not located within any remarkable environmentally sensitive area and will not cause any severe affect to the environmental

settings of the area, thus not going to create intimidation to important environmental features. No drainage congestion/water loggings have been observed in the road area. But, some local trees like betel nut tree, rain tree, mango tree, bamboo bushes etc., or additional vegetation may need to clear out due to construction activities, with appropriate offsetting measures to be taken. No agricultural productive soil will be used for the purpose. Earth will be compacted for stabilization. The inputs will be mainly at construction phase and limited within project boundary. Moreover, mitigation measures will be taken according to the ESMP for minimizing the air, dust and noise pollution.

It has been revealed that this project's scopes of works do not intend to overtake their area of lodgment and funding entity has no intention to do so. Moreover, other issue has also been brought to their attention that drainage system and a bridge have also been included into the evaluation of this project since runoff from higher grounds are also a concerning matter during rainy season.
People of the subproject area are very much optimistic about the success of the project and are also eager to participate in the project activities. The subproject is environmentally sustainable and socially acceptable. The local community attended in the participatory public consultation meeting. Their community representatives as teachers, shop owners, farmers and elders have no objection to the construction this infrastructure in the proposed site; the community also appreciated the initiative of LGED to ensure safe access and better portability. The public consultation meeting results confirmed that improvement of this road will increase socio-economic interest in the communities and make lives easier for these people. They also requested to construct the road in accessible width so that small auto and motor vehicles can pass easily. Water flow from undulated terrains is a factor that should be considered for construction because 1 week worth of rain invites water flow which makes this surrounding area logged in several places. On another matter, locals requested to involve the local community to construction works and material storage monitoring duties.

The road is not located within any identified environmentally sensitive area, and therefore, does not seem to cause any adverse impact on the important environmental features. No significant impact is expected on the ecosystem and biodiversity, no agricultural land/ activities or fish farming will be disturbed, due to the construction of the sub projects. Only forest is found as homestead forest on high grounds of the location.

Types of waste to be generated during construction and operation phase:
During construction period solid waste will be generated due to construction activities. The types of wastes are brick pit, unused sand, wood, gravels, bitumen etc. The types of wastes are gravel, stones, rock, wood, copper wires, concrete, iron, plastic etc. Negligible amount of plastic will come as residue. Moreover, liquid waste will include chemicals of bitumen leftovers, motor oils, used oil, Degreasing solvents etc. Human wastes and kitchen wastes will be generated from labor camps as well.

Sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site including elephant migration routes and remaining forests:

Within the influence area of the subproject no historical sites were identified. Sensitive environmental, cultural, archaeological, religious sites within 1 kilometer of site includes including

Baitur Rahman Jame Mosque (300m) and Rejur khal (10m) to the North. Shonaichori GPS (50m), Jalipalong Baitur Sarak Mosque & Hefzokhana(80m) to the south. Hazrat Ayesha Siddique Balika Madrassa(50m), lomboripara GPS(1km), Shoudagorpara Madrassa(1km), Hazrat Ayesha Mosque (50m) and pond (300m) to the east and Shonaichori Jame Mosque/ Madrassa/Hefzokhana (200m), Jaliapalong High School(100m), Shonaichori GPS (200m) to the west. Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists.

Mostly human settlements are found around the sub-project area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). Elephant migration routes were about 5-6 km away from this sub-project. No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below

Section A: Sub-Project Overview

Description of sub-project/component interventions:

This intervention will include the following items;

- **24.0m Palisading wall**
- **646.0m Toe wall**
- **Road safety** work and **Environmental Mitigation and Enhancement** works are also included (description of such items can be found in BOQ)

Sub-project Location:

Important Features	
ID	422945006
District	Cox's Bazar
Upazila	Ukhiya
Union	Jaliapalong
WARD	02
Proposed Chainage	845m
Road Type	Village Road-A
Proposed Intervention Type	BC
Distance from Upazila HQ	10km
Road Starting Point Coordinates and name	Latitude: 21.284210 N Longitude: 92.071860 E Road starts from Sonarpara Saikat Road
Road Ending Point Coordinates and name	Latitude: *21.291670 N* Longitude: *92.072460 E* Ends in Toingakhada near Rejur Khal

Land ownership

Government Land

Expected construction period: 1 Year

Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water bodies, etc. and historical or socio-cultural assets): Please also explain any analysis on alternative location was conducted:

Baitur Rahman Jame Mosque (300m) and Rejur khal (10m) to the North. Shonaichori GPS (50m), Jalipalong Baitur Sarak Mosque & Hefzokhana (80m) to the south. Hazrat Ayesha Siddique Balika Madrassa(50m), lomboripara GPS(1km), Shoudagorpara Madrassa(1km), Hazrat Ayesha Mosque (50m) and pond (300m) to the east and Shonaichori Jame Mosque/ Madrassa/Hefzokhana (200m), Jaliapalong High School(100m), Shonaichori GPS (200m) to the west. Within the influence area of the subproject no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (checked with local IUCN representative).

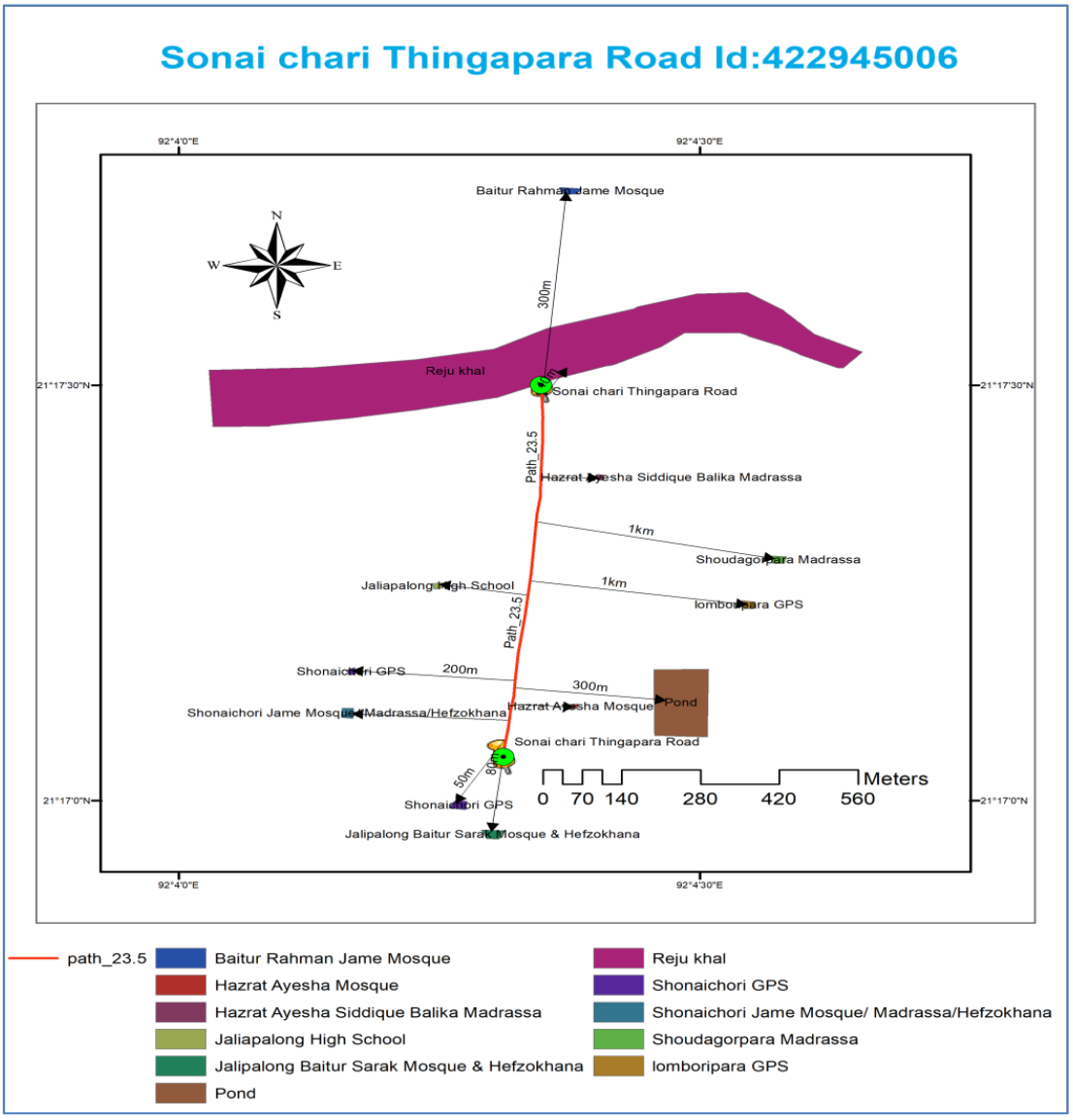
Section B: Environmental Screening

***B.1*: Environmental feature of sub-project location**

Description of cultural properties (if applicable, including distance from site):
Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests:

Baitur Rahman Jame Mosque (300m) and Rejur khal (10m) to the North. Shonaichori GPS (50m), Jalipalong Baitur Sarak Mosque & Hefzokhana (80m) to the south. Hazrat Ayesha Siddique Balika Madrassa(50m), lomboripara GPS(1km), Shoudagorpara Madrassa(1km), Hazrat Ayesha Mosque (50m) and pond (300m) to the east and Shonaichori Jame Mosque/ Madrassa/Hefzokhana (200m), Jaliapalong High School(100m), Shonaichori GPS (200m) to the west. There are no other sensitive environmental, cultural, archaeological sites within the catchment area of this sub-project.

A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas are shown below.



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive features found in the footprint area, except matured vegetation on the sides of the road which are homestead gardens and forest. Several mosques, madrasa and local settlement were found during the survey. It will not be affected by the construction works, as the activities will be carried out within the existing subproject boundary and necessary preventive and mitigation measures will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*

No. There is no existence of Elephant corridor/ route now, which have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) potential impacts on remaining forests in/around camps Yes/No
N/A (This activity will be confined within the existing subproject boundary)

(3) Other issues: N/A

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:
Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of vehicle-related pollutants 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/ preventable by mitigation measures.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, tractor, trailer, etc. move on roads adjacent to sub-project throughout the day and night generate noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation):

Landslide potential is low. There is low possibility of soil erosion or landslide during construction period of targeted sub-project. The impacts are negative but very small scale, site-specific within a relatively small area and adjustable by mitigation measures.

Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH):

Groundwater is the main source of potable water in the Sub-project area. The shallow depth is about 50 feet to 100 feet and deep tube well depth is 850 to 900 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 600-800ft (Field survey, 2019). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer.

Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)

Status of wildlife movement: **N/A** (None of the information was found about the wildlife movement in or across the area)
State of forestation: Patches of vegetation containing large and matured trees are present in local and homestead gardens across the road side of the proposed subproject area which are located within 200m radial distance.
Summary of water balance analysis (For water supply scheme only): **N/A**

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g. status of access road or any other facility required for sub-project to be viable): An access point called Sonarpara Saikat Road is available. It is possible to carry construction materials on these roads to the construction site with limited traffic flow to avoid congestion.
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction: Toilet and water supply facilities will be ensured by the contractor in the vicinity of the construction area for all the components of the sub-project, electric connection will be established with the accommodation facility due for the workforce. Electricity is available in the area.
Possible location of labor camps: Labor camp can be established along the road since there are available open private lands. However, this will have to be done with the consent of land owner under a mutual agreement, with the supervision of the Engineer in charge.
Requirement and type of raw materials (e.g. sand, stone, wood, etc.): i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction.
Identification of access road for transportation (Yes/No): Yes. Sonarpara Saikat road available as connecting road
Location identification for raw material storage: Adjacent to labor camp or different location is available. However, this will need placement on open fields and should be consulted with local committee. Material storage area must be well fenced and

materials will be covered with tarpaulins.
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.): Earth/ mud, plastics, brick chips, dust from bricks during construction of project components will be produce. Also, sludge will be produced from labor camp latrines and kitchen waste mostly composing of organic matters as fiber, starch, carbohydrates and proteins. 10% of the kitchen waste may be classified as plastics or non-biodegradables. Solid waste may amount to 20 kg daily and sludge may amount to 5 kg per day.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g. Solids wastes, liquid wastes, etc.): **Solid waste:** Residual waste from the labor camps will be generated. Equipment maintenance/vehicles on-site and scrap material will occur during construction works which are mostly solid waste. Leftover oils or spills from machinery can be a high probability generating liquid waste. Waste from civil works. And the quantity will be tentatively 150 kg. **Liquid waste**: During construction period fecal sludge will be generated from the labor camp and the quantity would be nearly 6 kg per day, which would be reduced in weight in course of time. Leftover oils or spills from machinery can be a high probability generating liquid waste.
Type and quantity of raw materials used (wood, bricks, cement, water, etc.): **Type:** i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction. **Quantity**: It is difficult to give exact figures of construction waste produced on a typical construction site.
Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards: No such vegetation is present in the right of way. Specific soil amount is not needed for the project. The current condition explains that there is no aggregated soil on the right of way.
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) The possibility is Medium, for stagnant water bodies to occur. Because water usage will be higher during the construction period. By default, this area has no water logging troubles due to being natural channels. Moreover, no possibilities of stagnation of water in long run. So, local communities have stated that they do not have severe troubles with mosquitos or other disease vectors.

Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) At the end of this road Rejur Khal resides but no modification or impact is expected for this intervention.
Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. Because under this intervention, there is very little scope of damage to terrestrial or aquatic ecosystems or endangered species.
Activities that can lead to landslides, slumps, slips and other mass movements in road cuts: Scope of work leading to low scale effects of landslide. The impacts are negative but short-term and site-specific. It can be managed through mitigation measures.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description) Low, since both sides of the road is more or less similar elevation. The concentrated outflow will be managed since the sub-project has included drains.
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: No
Chance of long-term or semi-permanent destruction of soils: (High/Medium/Low with description) No
Possibility of odor and water, soil quality impacts from SWM and FSM disposal system: (High/Medium/Low with description) No.
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) There is no possibility of stagnant water bodies remained for encouraging mosquito breeding and other disease vectors, during the operation phase.

Likely direct and indirect impacts on economic development in the project areas by the sub-project: Construction or implementation of a road project substantially contributes to the development of the project areas. It surely improves the communication network, reduces the transport time, increases the trade and business in/around the areas, and ensures access to better living conditions with amenities, better educational and job opportunities and health facilities. Thus, the direct and indirect impacts on economic development in the project areas would be enormous by this sub-project.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No existing drainage channels or surface water bodies found in the project area; therefore, no such effect can be anticipated
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. There are no protected areas in or around project sites, and no known areas of ecological interest.
Activities leading to landslides, slumps, slips and other mass movements in road cuts: The entire sub-project component area is nearly flat; thus, no such type of impacts is anticipated.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) No
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: Improved communication will definitely increase the traffic/ vehicular movement, which must increase the light and noise pollution, but air pollution effect will not be increased significantly, as the proposed BC road will reduce the pollution generated from dust on the muddy road, especially during the dry season and if the vehicles are maintained in good conditions

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm).

Section D: Environmental Screening Summary of the Work Package-23

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
1: Sub-Project Interventions	**Air quality**	Under the subproject intervention the overall score is **low**.	• Limiting earthworks; • Watering of dry exposed surfaces and stockpiles of aggregates at least twice daily, as necessary; • Requiring trucks delivering aggregates or bricks and cement to have tarpaulin cover and Limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Covering of trucks; • Records of air quality inspection;	Visual monitoring of air quality and if requires, air quality test (CO, $PM_{2.5,10}$) once in construction period in winter season.
	Soil impacts	Under the sub-project intervention the overall score is **low.**	• Precautions might be taken when rainstorms are likely, when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms. • The earthwork sites where exposed land surface is vulnerable to runoff shall be consolidated and/or covered. • The material stockpile sites shall be far away from surface water bodies and areas prone to surface run-off. Loose materials shall be bagged and covered. • Channels, earth bunds, netting, tarpaulin and or sand bag barriers	Construction Contractor monitored by Consultant and PIU	• No visible degradation to nearby drainages, • *khals* or water bodies due to soil erosion. • Rain storms in construction phase.	Monitoring as weekly basis.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
			shall be used on site to manage surface water runoff and minimize erosion. • The overall slope of the work areas and construction yards shall be kept to a minimum to reduce the erosive potential of surface water flows elsewhere.			
	Hydrology (surface and groundwater)	Under the subproject intervention the overall score is **low**.	• All precautions to store chemicals/oil/fuel properly so that no chance of spill. • Workers must specify waste dump locations to avoid littering which in turn might negatively affect surface and ground water. • Monitor water quality according to the environmental management plan.	Construction Contractor and monitored by Consultant and PIU	• Areas for stockpiles, storage of fuels and lubricants and waste materials; • Records of water quality inspection; Water Quality Test • (National Drinking Water Quality Standard Parameters)if requires; • No visible degradation to nearby drainages, *khals* or water bodies due to	Water quality test (mainly GW) twice during the construction period in six months interval.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
					construction activities. • Records should be kept and logged.	
2: Pre-construction Phase	**Sanitation, water supply**	Under the subproject intervention the overall score is **low**.	• Provide suitable housing, adequate supplies of potable water, and toilet and bathing facilities within labor camp area for the assigned laborer. • Provide means for disposing of wastewater from toilets, baths and food preparation areas either through a septic tank and soak away, or holding tank with removal by vacuum truck. • Records for any type of training or awareness building sessions must be kept at site.	Construction Contractor and monitored by Consultant and PIU	• Site-specific H&S Plan; • Records of supply of uncontaminated water; • Record of Health &Safety orientation trainings; • Condition of sanitation facilities for workers	Visual inspection by PIU and supervision consultants on monthly basis
	Transportation	Under the subproject intervention the overall score is **low.**	• Contractor should verify vehicles for the suitability of carrying, loading and unloading of materials	Construction Contractor and monitored by Consultant and PIU	• Record of regular inspection. • Record of accidents/incidents	Monthly monitoring.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
	Storage of construction materials	Under the subproject intervention the overall score is **low**.	• Orienting concerned person and team assigned for the construction work.	Construction Contractor and monitored by Consultant and PIU	• List of materials and sources of materials;	During implementation phase, as necessary with discussion with PIU, Consultant
3: Construction Phase	**Wastes**	Under the sub-project intervention the overall score is **low.**	• Prepare and implement on-site waste water runoff and labor camp waste management plan approved by PIU and consultants. • Wastes must be placed in the designated bins which must be regularly emptied. These shall remain within demarcated areas and shall be designed to prevent wastes from being blown out by wind. • All waste must be removed from the site and transported to a disposal site.	Construction Contractor and monitored by Consultant and PIU	• Complaints from community; • Regular inspection of waste management activity; • Waste disposal record.	As work weekly progresses
	Cut and fill Activities (Cutting of hill slope and earth removal from borrow areas caused for soil erosion and landslides)	Under the sub-project intervention, the overall score is low.	• During construction cut and fill will be balanced as far as is possible. Designs shall ensure that as far as possible all cut and fill activities are balanced • Proper care will be taken during cutting and filling so that slope or toe of the road embankment	Contractor, environmental specialist of D&SC	• Location of road alignment and slope.	Daily as work progresses

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
			remain within the right of way and does not disturb the crop.			
	Storage of materials	Protected and safety storage to be needed for construction materials storage. Not interrupt natural land contours, disturbance in natural drainage patterns and logging of water and the overall score is **low.**	• With the assistance from site management committee in Camp to identify the storage site and other requirements, which will be approved by PIU and consultants.	Construction Contractor and monitored by Consultant and PIU	• List of materials and sources of materials; • Storage areas for materials and equipment.	Monthly basis during implementation phase, as necessary with discussion with PIU, Consultant
	Removal of Vegetation (May cause soil erosion and their deposition on nearby crop field, affecting soil quality and productivity)	Under the sub-project intervention, the overall score is **low.**	• If during detailed design cutting of trees is required, compensatory plantation for trees lost at a rate of 5 trees for every tree cut. • Prevent workers or any other person from removing and damaging any flora (plant/vegetation) and fauna.	Contractor, environmental specialist of D&SC	• Complaints from community;	Daily

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
	Noise pollution	Under the subproject intervention the overall score is **low.**	• Consultation with affected people; not to operate noisy equipment during working period; • No noisy work after 5.00 pm. • Sound suppression for equipment; • Ear protection for workers. • Conduct noise quality monitoring as per EMP.	Construction Contractor and monitored by Consultant and PIU	• Number of complaints from stakeholders; • Use of silencers in noise-producing equipment and sound barriers; • Noise Level following decibel meter (dB)	Inspection by PIU and supervision consultants on monthly basis;
	Air pollution	Under the subproject intervention the overall score is **low.**	• Water spraying for dust control; construction materials with potential for significant dust generation shall be covered; no smoke emitting equipment; and limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor and monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Records of air quality inspection.	Visual observation and monitoring of air quality during construction period.
	Road Safety and Accidents	Under the subproject intervention the overall score is **low.**	• Erection of suitable signage at construction sites • Direct observation and discussion with local people • Restrict the transport of oversize loads. • Operate construction vehicles to non-peak periods (night) to minimize the traffic disruption. • Enforce on-site and access road speed limits.	Construction Contractor, environmental specialist of D&Sc.	• Complaints from communities, pedestrians	Day basis during work time

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
			• The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc. • Local residents should be kept informed about planned Works			
4. Post Construction	**Road Safety**	Under the issue the overall score is **low**.	• Install traffic signs for speed limit, speed breaker where needed, Mile post and create adequate ***traffic*** detours, and sufficient ***signage*** & ***warning*** signs, Post speed limits and suitable bending on the road. • The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc.	Construction Contractor, environmental specialist of D&Sc	• Road signage and safety instruments at suitable locations and chainage	Immediately after the construction work is over.
	Tree re plantation	Under the issue the overall score is **low**.	• Replantation of trees during monsoon period • Maintain of trees properly • Check survival of trees and replant the dead trees	Construction Contractor, environmental specialist of D&Sc	• Number of complaints from stakeholders; • Records of trees number and tree plantation inspection;	Immediately after the construction work is over.
5.	**Maintenance**	Under the issue	• No advertisement/boardings shall	LGED	• Number of	During Operation

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
Operational Phase	**of road and assets** (Road accidents may increase due to higher number of vehicles using the roads at increased speeds)	the overall score is **low**.	be allowed within the Right of Way limits of the project road. • Regular maintenance and cleaning of assets such as sign boards, road safety sign etc. shall be undertaken. • Clear smooth speed breaker/rough surfaces should be clear in views. • Regular maintenance of road surface and shoulders.		complaints from stakeholders;	under LGED's regular maintenance program in each 3 years.

* Overall Impact Score: High = Likely to cause long-term E&S impacts; Medium = Likely to cause temporary impacts; Low = Likely to cause little, short-term impacts

**Post-construction phase denotes the time period contractor use to clear and clean up the sites after the construction work is ended, perform tree plantation, grass turfing, and minor rectification till the official handing over the site to LGED, or owner of the site.

Recommendation for further environmental and social assessment and/or site specific environmental and social management plan: Yes

**If yes, please specify what assessments/plans would be required.* Mention some recommendation on E&S assessment …. ESMP

If site specific environmental and social management plan (ESMP) is followed the impacts can be mitigated and monitored. ESMP is attached.

Appendix-2: Environmental and Social Management Plan (ESMP)

ESMP for Access and evacuation Roads; *(LGED/EMCRP-W23.5):* Sonai chari Thingapara Road Id:422945006

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
Pre-Construction Stage	Loss of land / and other physical assets	• No land acquisition is allowed within this sub-project activities So, there are no any mitigation measures according to this impact.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of livelihood	• Under this subproject, there is no scope of negative impact of adjacent livelihoods	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Stakeholders Engagement	• All of the project stakeholders should be consulted • Separate community level consultation meeting with the potential affected HHs • Consultation meeting with host communities about the project objectives and scope of works	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of right to access	• Project to ensure thorough analysis of alternatives that access enjoyed by the community remains intact. • In case of unavoidable circumstances, alternative access will be provided.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Site Selection & implementing interventions: Human-elephant conflict	• Selection of sub-project sites and all implementing interventions must take place outside of the elephant corridor/influence area.	PIU	Environmental Consultant of PIU, PSC
Pre-Construction Stage	Site Preparation: Soil Erosion; Alteration of natural drainage	• Our selected sites avoided the low land near the water bodies or natural flow path to avoid the flash flood or any kind or surface runoff.	PIU & Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Tubewell location within the construction site is not near to any kinds of latrine and soaks well which could be contaminated by those. • After completing the development we restored the place as like before to avoid the cut and fill operational problems. • This site is in the local community, so we discussed with the local community to avoid any conflicts related local habitation, culture. • Sub project intervention mustavoid of natural disturbance of existing slop and natural drainage. • The contractor ensuring sound environment for the local residents near the sub project site.		
Construction Activity	Noise from construction works	• Construction activities mostly will finish at day time within 05 PM, and must confirm proper measures for avoiding any disturbance. • All Personal Protective Equipments (PPEs) must be ensured in sites before starting any kinds of construction works.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Dust	• Acceptable range of emission of CO, particulate matter [SPM (**Suspended particulate matter)**, PM2.5, 10] and Hydrocarbons must be maintained through good construction work practices • Dust generation must be limited as a result of clearing, leveling and site grading operations with	Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		using water florescent manually and through water pipes. • Dust generation due to vehicle movement on connecting road shall be controlled by watering the path at limited level		
Construction Activity	Safety Issues	• Unauthorized entry is completely prohibited in our site and take necessary measures for preventing this problem • Before works started Contractor must provide proper training and guidelines on health and safety issues to the labors and associated staffs. • Records of every training must be kept at site. • All kinds of Child labour are completely prohibited in every site. • Every construction materials storage site will be well fenced by Tin and safety caution tape.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Traffic Management	• Contractors will maintain proper route for traffic management which is to beconsulted with and confirmed by the Executive Engineer of Cox's Bazar.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Conflicts with existing users due to the scarcity of resource base.	• A detailed assessment of the available resources and consent of the local representative for withdrawal of water from existing surface water sources shall be taken. • If ground water is withdrawn, adequate approvals from the appropriate department need to be undertaken before setting up bore wells.	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Any type of consent letter or agreement for withdrawing water from either surface or underground sources will be kept on site. • Local community must be consulted before any construction works starts.		
Construction Activity	Increase in road accidents	• Maintain safety measures during the movement of heavy machinery and equipment. • Local community will be trained up on traffic management and awareness.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Labour Base Camp: Conflicts with the local residents	• Awareness building session will be undertaken about prevention of child abuse, child marriage, GBV, sexual harassment, trafficking of women and children as well as illegal drug trade. Written records of this awareness building session shall be kept on site. • Work force should be prohibited from disturbing the flora, fauna including hunting of animals, wildlife hunting, poaching and tree felling. • Adequate facilities ensuring sanitation for labour camps will be put in place • Treated water will be made available at site for drinking purpose. • Adequate accommodation arrangements for labour forces. • Labor code of conduct is to be disclosed through consultation.	Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Construction Activity	Waste Management: Improper	Preparation of a waste management plan covering the	Contractor	Environmental

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
	management and handling of hazardous and non-hazardous waste during construction.	following aspects: • Residual waste from the temporary accommodation facilities for labor Waste and from equipment maintenance/vehicles on-site • After completion of construction works. So, recycling process is not applicable. • Proper consents for hazardous waste management.		Consultant of PIU, PSC
Construction Activity	Health & Safety Risks: • The potential for exposure to safety events such as tripping, working at height activities, fire from hot works, smoking, failure in electrical installation, mobile plant and vehicles, and electrical shocks. • Exposure to health events during construction activities such as manual handling and musculoskeletal disorders, hand-arm vibration, temporary or permanent hearing loss, heat stress, and dermatitis.	• All construction equipment will be properly inspected timely. • The risk assessment will be prepared and communicated prior to the commencement of work for all types of work activities on site. • Preparation of proper walkways and clearly designation as a walkway has to be ensured; all walkways shall be provided with good conditions underfoot; signposted and with adequate lighting. • Proper Signpost at any slippery areas will be ensured in construction site. • Fire extinguishers will be located at identified fire points around the site. The extinguishers must be appropriate to the nature of the potential fire. • This sub project has Proper communicative emergency response plan (ERP) with all parties, the ERP to consider such things as specific foreseeable emergency situations, organizational roles and authorities' responsibilities and expertise, emergency	PIU & Contractor	Environmental Consultant as well as Social Development and Gender Specialists of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		response and evacuation procedure and personnel will be trained and drilled to test and ensure the coherence with the plan. • All people of construction site will be concerned about the safety and maintenance of Electrical equipment; works will be carried out on live systems. • Provision to first aid box in sub-project areas will be ensured. • Proper Emergency evacuation response plan will exist in sub-project area. • All safety equipment will be available in sub-project site (safety, size, power, efficiency, ergonomics, cost, user acceptability etc.), the lowest vibration tools will be provided that are suitable and can do the works. • Awareness training will be given to all personnel involved during the construction phase in order to highlight the heat related illnesses of working in hot conditions such as heat cramps, heat exhaustion, heat stroke, and dehydration. Written records of this awareness training shall be kept on site. • Adequate quantities of drinking water will be available at all Sites, on different locations within the site. • Provision to maintain proper PPE wherever necessary and to ensure that there are satisfactory washing and changing facilities. • Provision to ensure all workers exposed to a risk are		

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		aware of the possible dangers and also given thorough training on how to protect themselves and there should be effective supervision to ensure that the correct methods are being used.		
Operation &Maintenance	Noise disturbances to fauna	• Provision to maintain noise and vibration from the operation and maintenance of machinery and equipment by proper monitoring and measures. • Provision to take necessary lighting, caution for the works and necessary maintenance should be done in day light.	PIU	Environmental Consultant of PIU, PSC. Union Member
Construction activity	Odours and pollution caused by leaking latrines and faecal sludge, and solid wastes impacting surrounding water bodies, flora and fauna	• Preventative maintenance schedule should be followed. • Solid organic wastes should be stored in bins and/ or skips and emptied regularly at a designated waste disposal area away from the camp site. If no designated site is available within the reach, a dug-hole at a nearby place can be used with periodic filling with soil layer for preventing pollution and generating nutrient rich compost soil over time.	PIU	Environmental Consultant of PIU, PSC. Union Member
Decommissioning during the project implementation period (including site clearance after the construction)	The impacts are similar to those listed in construction stage: • Pollution from waste materials • Health & Safety risks to workers and local community	• Contractor must prepare a demolition and waste management plan including following directive aspects given hereunder.	PIU / Contractor	Environmental Consultant of PIU, and Executive Engineer of Cox's Bazar

Waste Management Plan:

The Contractor shall develop a waste management plan for various specific waste streams (e.g., reusable waste, flammable waste, construction debris, food and organic waste etc.) prior to commencing of construction and submit to LGED for approval. The plans must include following principles or series of actions, which will be carried out/followed by the contractor and supervised by the Field level Environmental Specialist and Social Development Specialist.

For wastes:

- The quantity of waste materials shall be minimized by 3R (Reduce, Recycle and Reuse) approach, and wastes shall be segregated accordingly, wherever practical; and stored in designated places/facilities in the site.
- Construction site shall be maintained in a cleaner, tidy and safe condition and appropriate facilities shall be provided and maintained as temporary storage of all wastes before transportation and final disposal.
- Hazardous waste viz. waste oil etc. will be collected and stored in a paved and bounded area and subsequently sold to authorized recyclers.
- The scrap material generated from related construction activities will be collected and stored separately in the stack yard and sold to local recyclers.
- All wastes generated during construction shall be disposed off in an environmentally acceptable manner. This will include consideration of the nature and location of disposal site, so as to cause less environmental impact.
- Other leftover non-hazardous wastes, including construction debris shall be transported to an approved disposal site by pick up tracks or back loaded vehicles with proper care.
- Organic wastes produced in the camp site during the construction period shall be collected and transported in vehicles covered with tarps or nets to prevent spilling waste along the route to the designated disposal site;
- Burning of any type of wastes in the construction site shall be prohibited completely.

Prepared by: Harogopal Kabiraj, Environmental Focal Person, +8801714980171

Tanvir Ahsan Haque, Environmental Specialist, +8801688117059

Ms. Sadia Azad, Disaster and Climate Change Specialist, PIU.

Reviewed by: Md. Saiful Islam, Field Level Environmental Specialist, +8801913442006

Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.5

In consideration to the above-mentioned environmental impacts and their mitigation measures for this sub-projects, individual BOQ for each component has been prepared. Following tables will illustrate such items of enhancement and impact mitigation works as well as considering the emerged situation of COVID-19, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites.

Cost of Environmental Enhancement Works for W23-5 in BOQ

Sl no.	Description of item	Quantity	Unit price	Total amount
1.	**Grass Turfing** Turfing on embankment top and slope & any critical place with good quality turf supplied by the contractor of not less than 225mm square in dimension including placing and watering till grass is fully grown, etc. all complete as per direction of E.I.C. (Payment to be made only when grass is fully grown)	2416.30 Sq.m	@38.15 Tk. Per sqm	92181.85
2.	**Dust suppression measures** Dust suppression measures like water sprinkling on aggregates/unpaved roads, in and around the work site and as per direction of E-I-C	845.0m	@ 2.56 BDT	2163.20
3.	**Water Supply and Sanitation** Providing and maintaining adequate portable water supply, sanitation, cleanliness facilities at camp site and work site to the entire satisfaction of Engineer-in-charge. **Temporary Toilet:** Construction of temporary toilets in work site/ rest area complete as per design and specifications and approved by the Engineer-in-Charge. There should be 1 camp in each site. In each camp, there should be 1 no of toilet for women and 1 no of toilet for men.	2 nos.	@12822.86 per toilet	25,645.72

Sl no.	Description of item	Quantity	Unit price	Total amount
4.	**First Aid Box** Supplying, equipping and maintaining adequate first-aid box throughout the working period at worksite and site office, and erect conspicuous notice boards directing where these are situated and providing all requisite emergency medical first aid kits, including complying with the government medical or labour requirements at all times, and provide, equip and maintain necessary dressing kits throughout the working period for attending minor injuries, etc. all complete as per requirement and full satisfaction of Engineer-in-charge.	1 no.	LS @5000 Tk. Per box	5,000
5.	**Drinking Water Facilities** Providing continuous adequate drinking water supply at worksite and site office as well by installing necessary tube-well/s where applicable or any other means depending on local situation, also providing essential arrangement for storing drinking water by supplying portable best quality water tank equivalent to Gazi/Padma of adequate capacity depending on the number of users, including supplying 1 (one) no. best quality water filter of minimum capacity 30 liters with necessary kits, etc. all complete as per satisfaction and direction of the Engineer-in-charge.	2 no.	LS @ Tk. 30,000	60,000
6.	**Traffic Management** Maintaining traffic management at worksite from time of commencement of contractor's activities to time of completion activities, including ensuring that the road is safe for users, providing a safe working area for those involved in work on trafficked network and minimizing any disruption to smooth flow of traffic (this includes providing necessary barricades, warning signs/lights, guide signs, flagmen, maintaining diversion roads by cutting, filling, constructing, etc. or by any other means) in accordance with the full satisfaction of the Engineering-in-charge.	1 no.	LS @ Tk. 15,000	15,000

Sl no.	Description of item	Quantity	Unit price	Total amount
7.	**Personal Protection Equipment for Workers** Providing and maintaining appropriate (safe design, fit and comfort) personal protection equipment (PPE) to ensure the highest possible protection for employees in establishing and maintaining a safe and healthful working environment at workplace, including demonstrating, providing training on proper understanding and development of skill in the use of PPE, including supplying (i) best quality safety jacket, (ii) suitable hand protection gloves, (iii) appropriate foot protection shoes, (iv) best quality safety helmets, face shields, ear muffs etc. (v) suitable eye protection goggles	LS	LS @ Tk 30,000	30,000
8.	**Tree plantation** Tree plantation to compensate the felled down trees and enhance the ecological condition in the subproject area- preferably local fruits, flowers, medicinal and ornamental trees- Mango, Jackfruit, Jam, Kathbadam, Chalta, Krisnachura, Bokul, Jarul, Polash, Kadom, Shimul, Neem, Arjun, Amloki, Horitoki, Bohera, Mahogany, Palm Tree, Chambal, Rain Tree, Shil koroi, Satim, Sishu (including protection, fencing and conservation during project defect liability period): Preferably at both sides of Road where space is available (fencing as per LGED rate schedule 5.26.14) (Contractors will also be instructed by the consultant and PIU prior to the tree plantation work) at an interval of 10 feet.	80 nos.	@ Tk. 1000	80,000
9.	**Motivation training** Motivation training (twice: before and after construction start) of the Upazila Engineer 'sand Contractor's representatives on safety practice and as per direction of the E.I.C.	1 no.	LS @ Tk. 10,000	10,000
10.	**Waste disposal facility** Temporary camp site waste disposal facility improvement 2 nos. (1 no of organic waste and	LS	@ Tk. 5000	5,000

Sl no.	Description of item	Quantity	Unit price	Total amount
	1 no of inorganic waste disposal facility) and as per direction of E.I.C.			
11.	**Water Test (Drinking Water samples)** Water samples are to be collected periodically (half yearly) from the tube well at labor shed area for laboratory analysis of different parameters such as pH, arsenic, iron, chloride, hardness, total dissolved solids, nitrate, nitrite, coliform, electrical conductivity etc. all complete as per direction of E.I.C. (including the cost of actual fees for testing from reputed laboratory and report) as desired by E.I.C.	LS	@ Tk. 5000	5,000
12.	**Working labour shed:** Construction of Labor shed (Size: 30'x20') with C.I sheet Roofing, Tarza fencing and brick soling floor as per requirement and direction of the E-I-C.	1 no.	LS @ Tk. 30,000	30,000
13.	**Environmental management** Environmental management costs of the Environment & Social/ Safeguard Personnel for Environmental and Social Management and Monitoring during construction and operation phase for their salary & transport (Net payment excluding Tax &VAT). And as per direction of the E.I.C. **(One Safeguard Personnel for R3, R5, R7, R11 & R14)**	1 person	Monthly basis @Tk. 35,000.00 for 12 months. One person covering 5 roads i.e.35,000Tk.*12months*(1/5 one road).	84,000.00
	Subtotal Bill: Environmental facilities			**443,990.77**

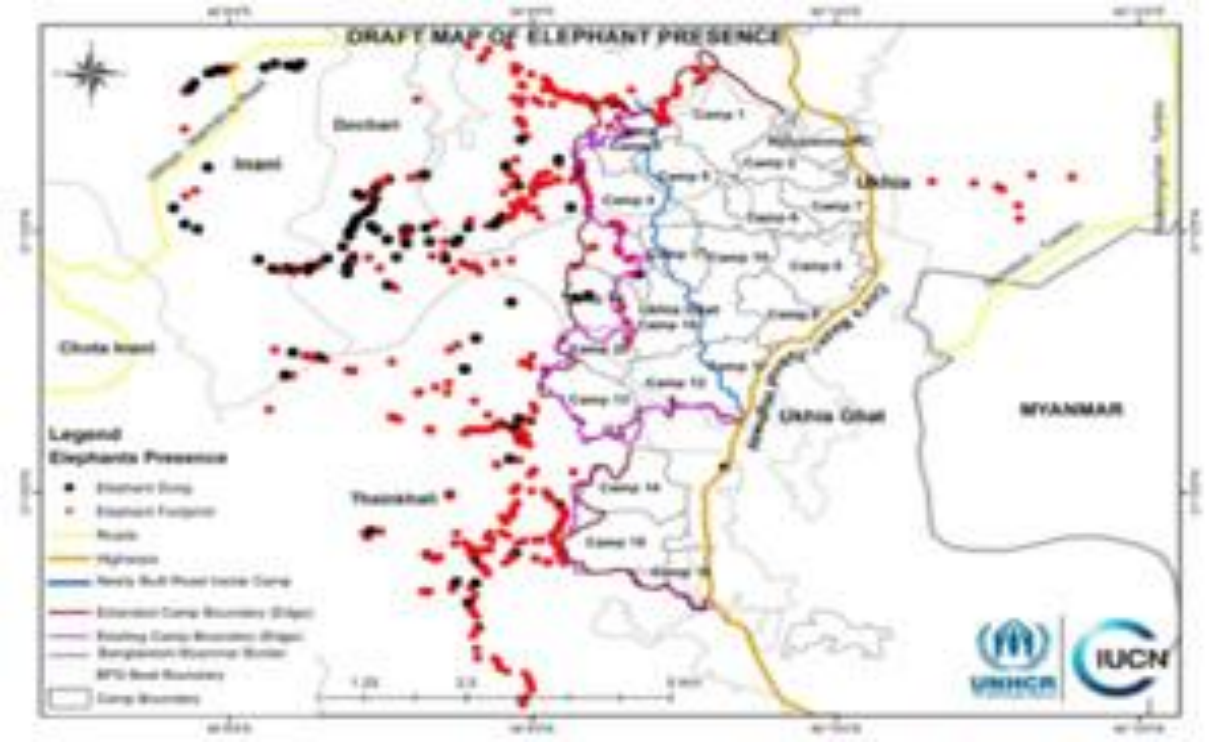
Cost of H&S Measures under COVID 19 Situations for W23-5

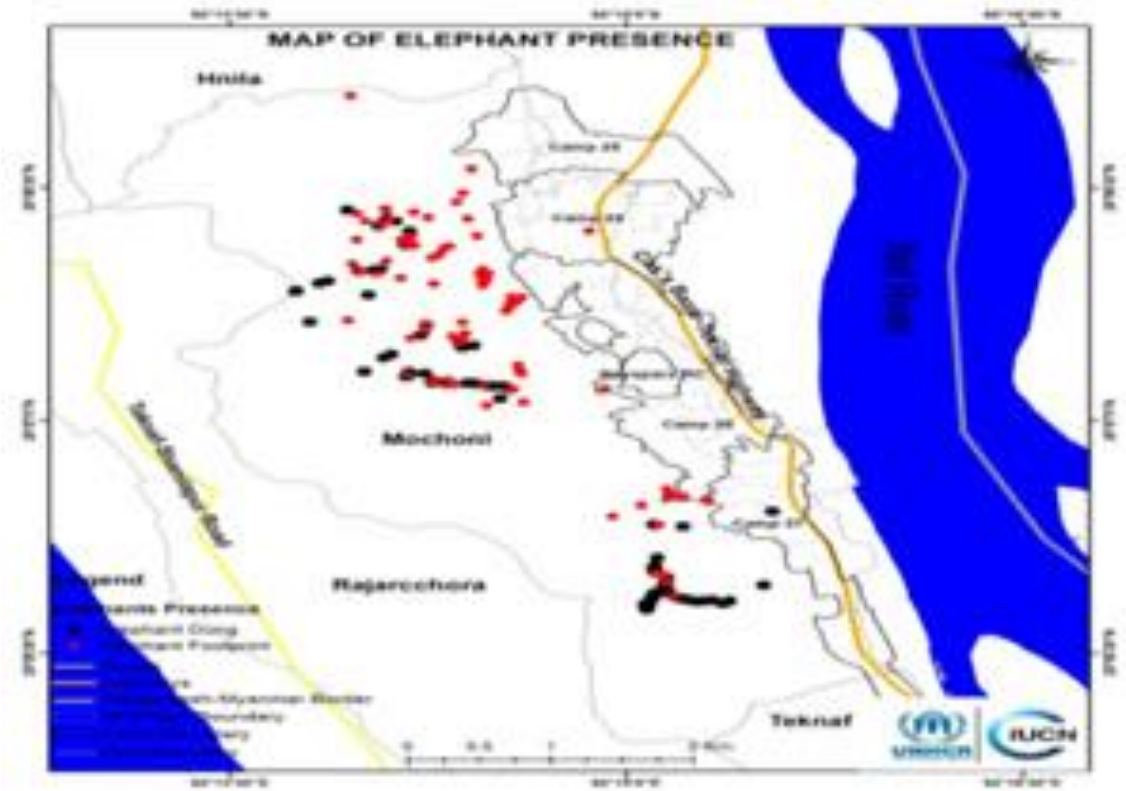
Considering the emerged situation, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites. The cost is estimated counting 15 workers for 270 active working days (9 months in a year) in a contract period for one site under this package (EMCRP/W-23.5).

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
1.	Non-Contact IR Digital Thermometer	01 nos. in each site	N/A	N/A	5,000.00	1	5,000.00	Each site office will have a thermometer for checking body temperature every morning at the entrance of the working site
2.	Wash Basin with Small Water Tank, Bucket and Mug (or piped water supply)	01 nos. in each site	N/A	01 nos. in each camp	10,000.00	2	20,000.00	Wash basin to be installed at favorable locations immediately after the entrance to the facility
3.	Trash bin (covered)/Paddle Bin	01 nos. in each site	N/A	01 nos. in each camp	550.00	2	1,100.00	
4.	Bar Soaps (150 gm each)	41		51	50.00	92	4,600.00	To be placed in a case/holder on the basin, for washing hands for max. 37 people a day and showering of 32 workers in each labor camp.
5.	Hand Sanitizer (2 nos. 250 ml bottle and 5 liter Can for Refill)	2 bottles and 1 Can for each site	N/A	N/A	4,000.00	1	4,000.00	2 bottles and a 5 litre can for each Site office
6.	Face Shield/ Protective Safety	9 nos. for each site		N/A	400.00	9	3,600.00	For labors who work in close contact, 9 in each site

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
	Goggles							
7.	One time Mask (Disposable) for Contractors' Staffs	5 nos. each day in each site		N/A	12.00	1350	16,200.00	Reusing N95/KN95 mask will not be a manageable option in field scenario, one time disposable medical/surgery mask a good option instead.
8.	Cloth mask for Workers	N/A	15 nos. for each labor camp		35.00	270	9,450.00	A worker will use a mask for 15 days with everyday washing
9.	Floor Cleaner (1 litre Can)	1.5 Can	N/A	3 Can	250.00	4.5	1,125.00	
10.	Detergent Cleaner	N/A	1.500 kg in each camp/month		400.00	13.50	5,400.00	To be used for washing clothes, masks and tools & equipment, etc.
11.	Miscellaneous cost				20,000.00	1	20,000.00	Contingency cost for medical emergency and compensation for workers, subject to proper documentation
	Grand Total						**90,475.00**	

Appendix-4: Elephant Migration Routes Map





Elephant presence map (latest information published by on 24 May 2018)

Appendix-5: Location Map of Sub-project component

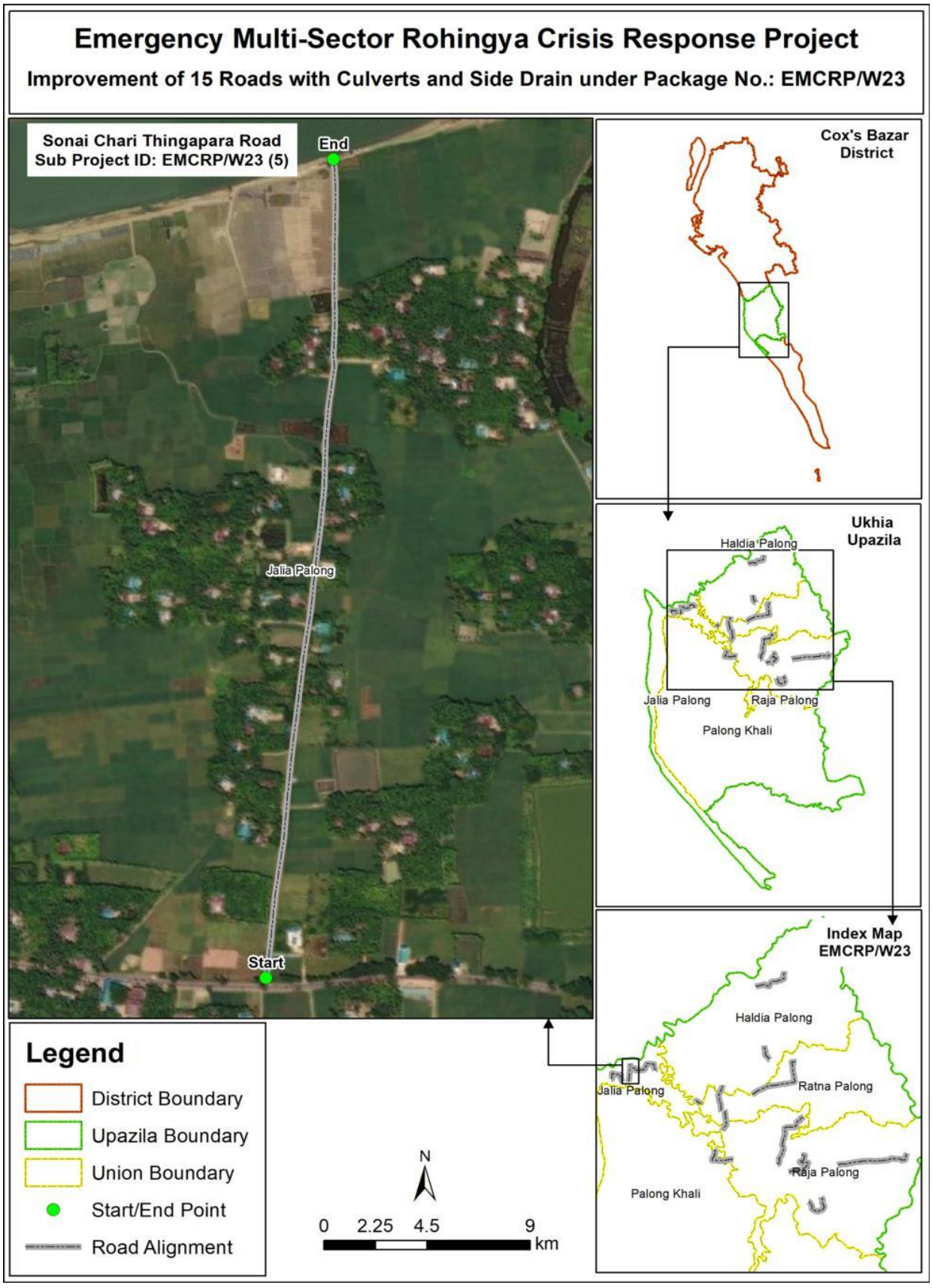
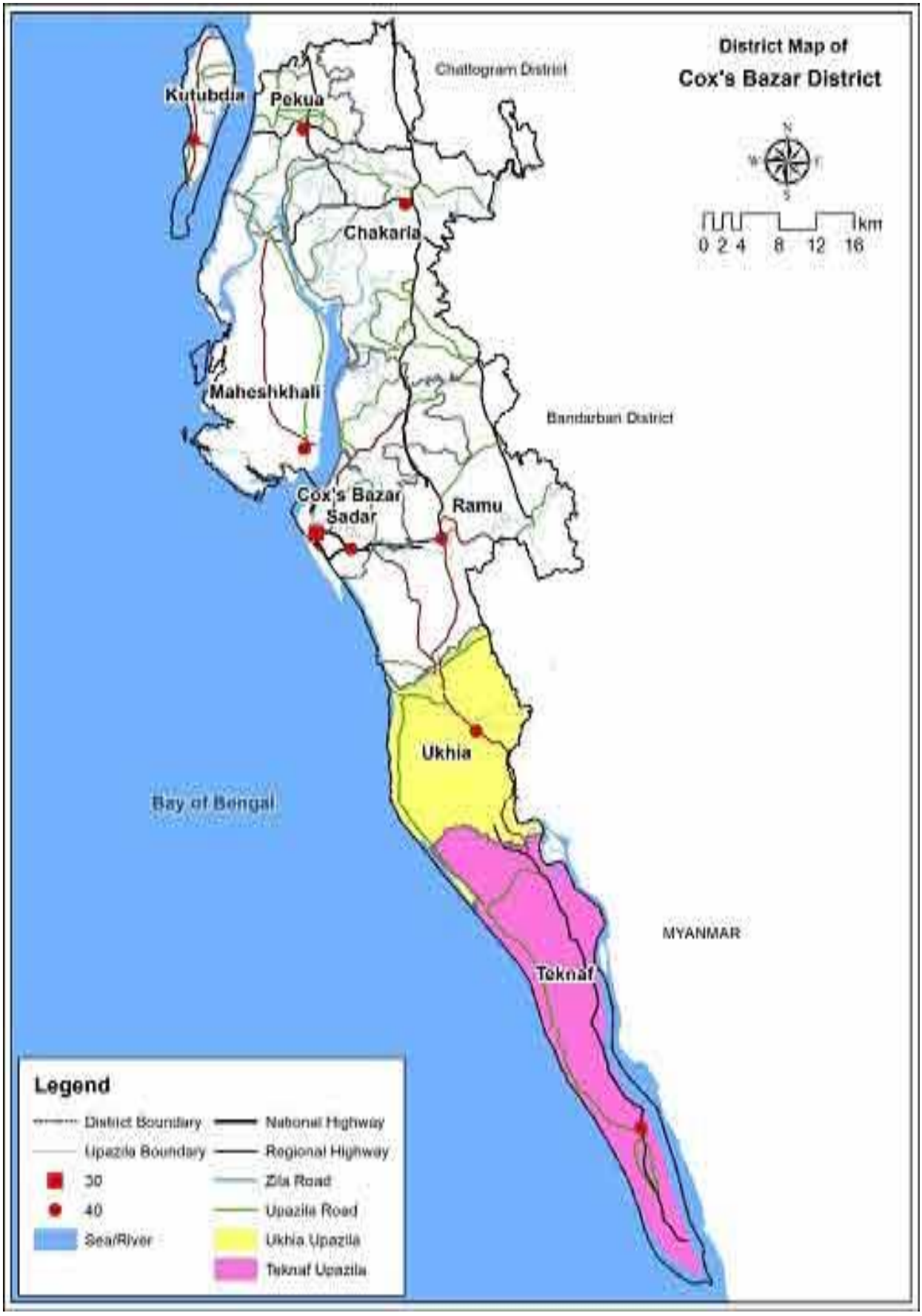
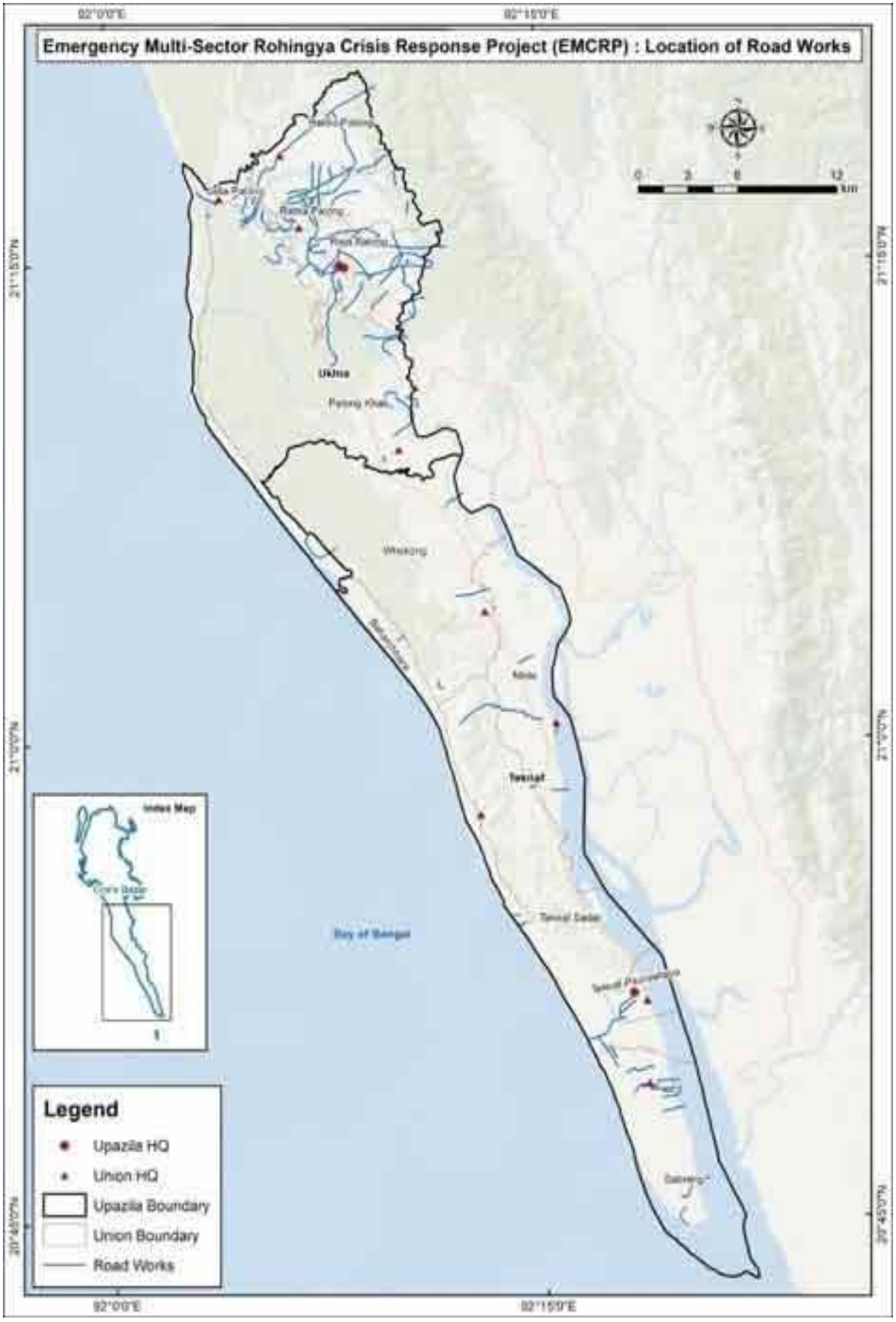


Figure: Location Map of W23-5



District map showing Ukhiya and Teknaf Upazila



Upazila map locating proposed roads

GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH
Ministry of Local Government, Rural Development and Co-operatives
Local Government Division
Local Government Engineering Department

Emergency Multi Sector Rohingya Crisis Response Project (EMCRP)

Project ID: P167762 **IDA Credit No. 5561-BD**





Environmental Screening Report

For North Sonaichari-West Sonaichari Road with culverts and side drain under Cox's Bazar District.

Under the package no. EMCRP/W23

Funded by:

THE WORLD BANK
IBRD • IDA

Government of the People's Republic of Bangladesh & World Bank

Design and Supervision Consultancy:

Development Design Consultants Ltd.

October-2020

Contents

1. INTRODUCTION 1
1.1 Project background 1
1.2 Elementary information of Work Package Components for W23.6 2
1.3 Proposed intervention items of sub-projects 5
2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS 5
2.1 Methodology 5
2.2 Important features/establishments within the PIA 6
3. ENVIRONMENTAL SCREENING 9
3.1 General 9
3.2 Major Findings 9
3.3 Climate Change Impact Screening 12
3.3.1 General Overview of the area 12
3.3.2 Site Specific Screening and outcome 13
4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) 14
4.1 General 14
4.2 Health and Safety Measure under COVID Situation 17
4.3 Cost of Environmental Enhancement Works in BOQ 18
5. LIMITATION OF THIS STUDY 18
6. CONCLUSION AND RECOMMENDATIONS 18
Annexure-01: Important Environmental Features (IEFs) near site: 20
Annexure-02: Attendance of consultation meeting 21
Annexure-03: Pictures of sub-project component location and surrounding features with public consultation 22
Appendix-1: Environmental Screening Form for examining sub-project component 23
Appendix-2: Environmental and Social Management Plan (ESMP) 41
Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.6 49
Appendix-4: Elephant Migration Routes Map 55
Appendix-5: Location Map of Sub-project component 56

ACRONYMS

BOQ	Bill of Quantities
BFS	Brick Flat Soiling
D&SC	Design and Supervision Consultant
DoE	Department of Environment
DRP	Displaced Rohingya people
EA	Environmental Assessment
EC	Electrical Conductivity
EMCRP	Emergency Multi-Sector Rohingya Crisis Response Project
ESMP	Environmental and Social Management Plan
ERP	Emergency Response Plan
ESMF	Environmental and Social Management Framework
FDMN	Forcibly Displaced Myanmar National
FGD	Focus Group Discussion
FSM	Faecal Sludge Management
GBV	Gender Based violence
GPS	Government Primary School
GRM	Grievance Redress Mechanism
HBB	Herring Bone Bond
IEFs	Important Environmental Features
ISCG	Inter Sector Coordination Group
IUCN	International Union for Conservation of Nature
IWM	Institute of Water Modeling
LGED	Local Government Engineering Department
PIA	Project Influence Area
PIU	Project Implementation Unit
PMU	Project Management Unit
PPE	Personal Protective Equipment
PSC	Project Steering Committee
SMC	School Management Committee
SPM	Suspended Particulate Matter
SWM	Solid Waste Management
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
UNHCR	The United Nations High Commissioner for Refugees
VAT	Value-Added Tax
WB	World Band

1. INTRODUCTION

1.1 Project background

An estimated 730,000[1] people of Rohingya community has fled to neighboring Cox's Bazar district of Bangladesh since August 25, 2017 to escape extreme violence in Rakhine State of Myanmar, which caused the total number of Forcibly Displaced Myanmar National (FDMN) in the district to be about 923,033[2]. This huge number of displaced population account for about one-third of the total population of Cox's bazar, a district which was already facing many development challenges and suffering from resource-constrained social service delivery system even before the crisis evolved and the mass exodus of FDMN has worsened the situation further. Almost all of these displaced people are hosted in Ukhiya and Teknaf Upazila of Cox's Bazar, in extremely congested settlements in areas having very minimal access to basic infrastructure and services and is prone to natural disasters. The Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP) has been designed in order to reduce the vulnerability of Forcibly Displaced Myanmar National (FDMN) along with people from the host communities in Teknaf and Ukhiya Upazila under Cox's Bazar District, to different disasters and improve the social service delivery system and disaster resilience to both the communities. This project will follow a sustainable development pathway that is resilient to disaster and climate change effects.

The objective of the Project is to provide greater protection for the FDMN and host communities through:

- Reducing the vulnerability to natural disasters
- Improving social service delivery system and providing better communication facility through physical interventions
- Improving water and sanitation facilities
- Reducing vulnerability to accidental fire
- Provisioning better educational facilities and
- Strengthening and scaling up of GBV prevention services to the FDMN

The project is jointly being implemented by Local Government Engineering Department (LGED), Department of Public Health Engineering (DPHE) and Ministry of Disaster Management and Relief (MoDMR) under their respective mandate and scope of works. Apart from the interventions in Addressing Gender and Social Inclusiveness and Preventing Gender Based Violence with the Support from UNFPA and building Communication and Awareness among all affected parties through an effective engagement of BCCP (Bangladesh Center for Communication Programs) in the areas, LGED is implementing a good number of infrastructural facilities, namely improvement of hat bazars, roads (both inside and outside of the camps), bridges, culverts, construction of School cum multi-purpose disaster shelters, Satellite Fire Stations, Relief Distribution Center, Community Service Center and many other different types of facilities. Given the project interventions, sensitivity of the areas and volume of people in or around the sites, the project is more likely to trigger certain Operational Policies and Bank Procedures, namely Environmental Assessment (OP/BP 4.01), Natural Habitat (OP/BP 4.04), Forest (OP/BP 4.36) and Physical Cultural Resources (OP /BP 4.11).

[1] ISCG: Situation Report Rohingya Refugee Crisis, (September 27, 2018)
[2] IOM Needs and Population Monitoring round 12 as of October 10, 2018

1.2 Elementary information of Work Package Components for W23.6

It is imperative to recognize proposed components under Work Package-23.6 in Ukhiya Upazila in order to assess and verify its interventions according to stipulated screening requisites from WB. Acknowledging this matter, such details are accounted for as given below in Table 1.2.1 along with visual presentation (General Upazila Map) given in Figure 1.2.1. Aerial maps for each sub-project is given in Appendix -5.

Table 1.2.1: Basic Featured Information of components [Sources of data: Field survey, 2020: DDC & LGED]

COMPONENT'S NAME UNDER W-23.6	GPS COORDINATES	DISTANCE FROM UPAZILA HQ	UNION	WARD	LOCATIONS UNDER PROJECT INFLUENCE AREA	PRE-EXISTING CONDITION OF ROAD	PROPOSED ROAD TYPE	ROAD DIMENSION(M) (LENGTH X WIDTH) = FOOTPRINT (SQ.M) *
NORTH SONAICHARI-WEST SONAICHARI ROAD ID:422945018	**Starting Point** $21^0$17'08" N $92^0$03'54" E **Ending Point** $21^0$17'3.99" N $92^0$04'9.2" E	10 Km	Jaliapalong	2	West Sonaichori	BFS	Bituminous Carpeting (BC)	(945mX4.9m) = 4,630.5 Sq.m

*Note: Roads are proposed to have average carriage way of 3.7m with 0.6m shoulder on each side; special conditions may prompt further adjustments while in construction period. However, footprint for roads are calculated with an average of 4.9 meters.

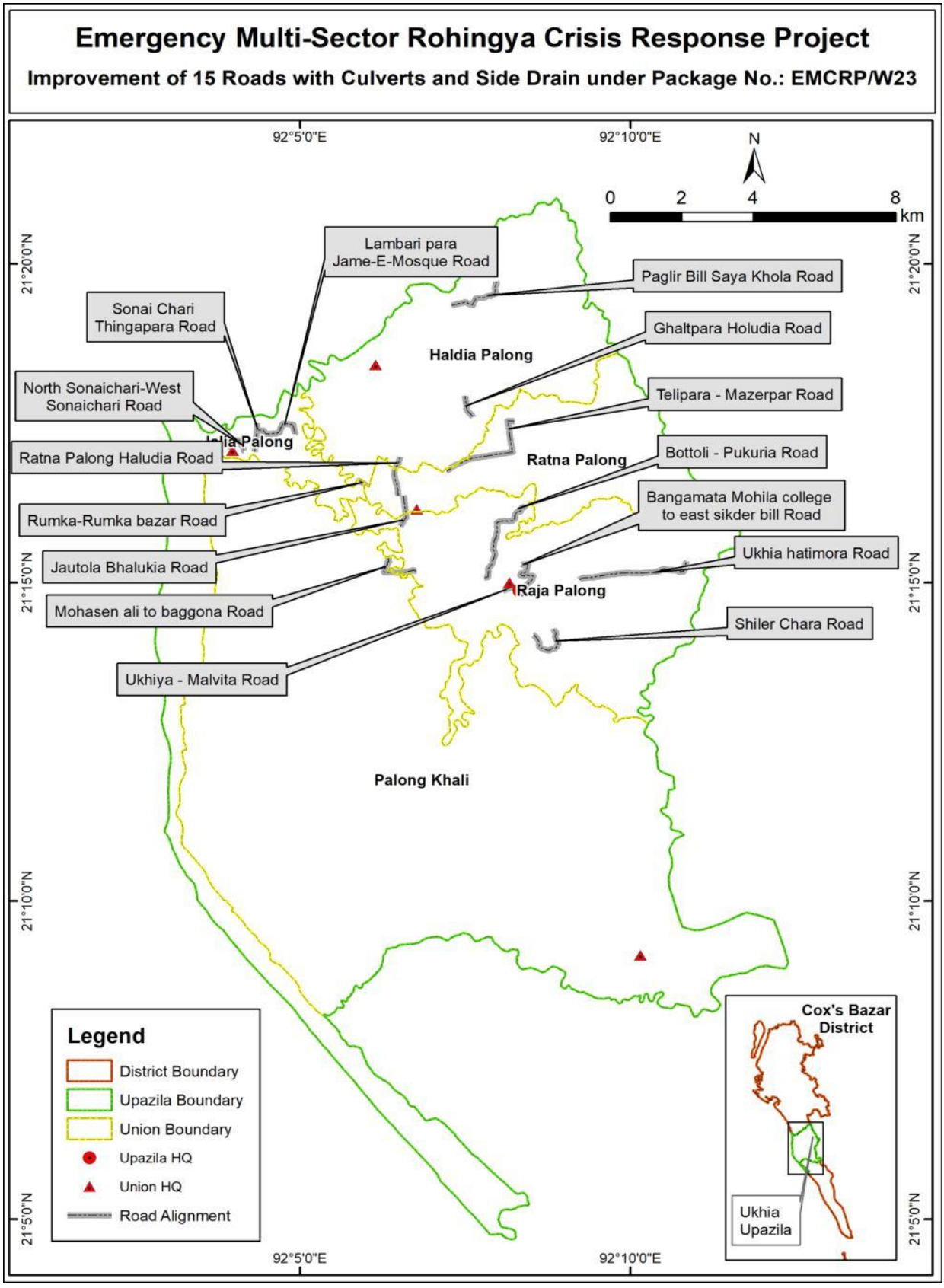


Figure 1.2.1: Map illustrating Roads of Work Package EMCRP/W23 locations in the Ukhiya Upazila

1.3 Proposed intervention items of sub-projects

The roads under work package W23.6 have been proposed with specific need basis dimensions to accommodate and ensure best quality interventions for local stakeholders. In context of governing environmental circumstances and geo-meteorological conditions, protection work items have been added to construction design for safety and sustainability of each proposed roads. These roads are abutting agriculture hence, construction and improvement works will descent these roads into new circumstances in some parts. These items have been included on the basis of field survey and analysis of these conditions. Please follow the table to acknowledge these items.

Table 1.3.1: Proposed safety interventions of each sub-project for W23.6

W23-6: North Sonaichari-West Sonaichari Road Id:422945018
Construction of 06 nos. Cross Drain (dimension: 0.975mX 0.975m) at Ch. 168.0m, Ch. 470.0m, Ch. 515.0m, Ch. 565.0m, Ch. 607.0m & Ch. 879.0m of chainage and construction of **01 no. Box Culvert** (dimension: 2.0mX2.0m) at Ch. 362.0m of chainage, construction of **281.0m Toe wall** and **25.0m Palisading work** at different Chainage, Construction of **Earth** works, **Road safety** works and **Environmental Mitigation and Enhancement** works. Description of Environmental Mitigation and Enhancement works can be found in BOQ attached in Appendix-03.

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS

2.1 Methodology

Public participation and community consultation have been taken up as an integral part of environmental assessment process of the project. As part of the impact assessment, participatory public consultation was conducted in areas of concern for proposed road by the field level staffs and consultants from PIU and D&SC. The consultation meeting was attended by disparate social groups representing local habitants, separate age groups, social class and occupations. In some cases, IUCN employees in charge of elephant watch tower were present where frequent elephant movements occur. The participants were also selected from different segments of stakeholders, and some of whom will have major active roles before, during and even after the construction works. Therefore, the meeting was organized in an informed, expressive and unbiased manner, wherefrom different views and concerns came across which will be properly taken care of during the design and construction phases. In order to serve our screening process, relevant items were thrown towards the audience to discuss and troubleshoot confusing or worrying matters regarding the proposed intervention under package work. Impacts in regards to environment, socio-economic matters during pre-construction, construction and post construction phase has been put forth. Possible mitigation measures and relevant needs have turned out during these sessions as well. Moreover, their comprehension as a stakeholder has been up lifted in light of project guidelines.

However, public consultation is a living process as the types of problems/ difficulties, involved parties or stakeholders and mode of settlement or resolution processes are more likely to differ with time. Thus, consultation with different parties or stakeholders will be continued throughout the sub-project implementation period and records of resolutions, whatsoever and wherever possible, will

be kept in writing at the site and made available on any enquiries or requests by all parties concerned.

All components under the work package have been put through review for locating impediments or possible adversity effecting future environment and socio-economic conditions. In order to comprehend surrounding features and impacts which may stipulate with it, screening has acknowledged having a Project Influence Area (PIA) of 0.5-kilometer radius. Sensitive findings have been identified if any, and relevant mitigation or minimization measures were suggested to subdue such complication for over the project construciton period. Moreover, evaluation was inspired to enhance environmental features and include monitoring initiatives under ESMP budget to ensure exertion of environmental improvement propositions. Contractor's responsibility has been taken into account while identifying possible impacts through sets of intervention accounts. These steps have been initiated strictly following ESMF guidelines and requirements. Environmental screening procedure was motivated by ingredients highlighted in Appendix-2 of ESMF. During survey, detail chainage length of the sub-projects was taken into account for detailing environmental and socio-cultural features within 100 meters buffer zone of both Left and Right side from the center line of the road. Longitudinal intervals of 300 meters have helped to identify positions of sensitive or near-sensitive socio-cutural features. These findings are illustrated in **Annexure-01**.

2.2 Important features/establishments within the PIA

Initial screening process is conducted through direct involvement of PIU and D&SC in the influence area of the proposed component, which allows to raise significant questions and ideas towards participants. In combination of both field walk-through and inputs of audience, a register of existing features is formed. Allow the following table to describe such elements in all the work package components.

Table 2.2.1: Important features within Project Influence Area for W23.6

Component's name under W-23.6	Direction	Important features/ establishment (approx. distance from the proposed site)
North Sonaichari-West Sonaichari Road Id:422945018	North	West Sonaichori mosque (30m), Reju Khal (400m), Pachardwip hill (500m)
	South	Playground (400m), Kalarghona hill (800m), Jaliapalong- Sonaichori Mosque, Madrasah & graveyard (20m)
	East	Sonaichori jame mosque & graveyard (600m), Sonaichori GPS (150m), Jaliapalong High School (150m), pond (500m)
	West	Sonarpara bazar (850m), Jaliapalong UP (600m), Sonarpara central mosque (1km)

2.3 Issues and Recommendations raised by the Participants in regards to component interventions

After inauguration has set in motion, their valuable opinions and remarks came pouring out. At this point, we find our field base knowledge for assessment attributed impact degrees and possibilities. Please follow the table 2.3.1 given below to recognize participants' inputs arranged in relevance with this component. Consultation meeting summary, attendance sheets and pictures of separate meetings with proposed location for this sub-project component can be found in Table 2.3.2 and Annexure-02 and Annexure-03 respectively.

Table 2.3.1: Issues and Recommendations raised by the Participants

COMPONENT'S NAME UNDER W-23.6	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
NORTH SONAICHARI-WEST SONAICHARI ROAD ID:422945018	•They are very much concerned with absence of reliable path route in West Sonaichori village area. •Lack of proper and strong road keeps motor vehicles from accessing these locations. • Big vehicles cannot use this road such as delivery trucks. •Possible dust and noise pollution during the construction works. •Safety of children and adults at the sites during construction works.	• Local people considered that the selected site is suitable for the construction of this road from both the technical and social-environmental (direct savings in the cost of operating vehicles, time savings by travelers and freight, wider effects can less accident rates, road being waterproof and dust free, much more durable) point of view. It will provide better mobility and access to services in due time. •Enough pathway is expected for vehicle movement so that comfort travel is achieved. •Construction site safety should be ensured to avoid any mishaps or accidents during work periods.

COMPONENT'S NAME UNDER W-23.6	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
	•Elephant movement is not present in the targeted area. •Local community wish to have a better drainage system along with the road in order to allow waters from undulated terrains to find an uninterrupted pathway not causing harm to agriculture fields and wash away top soil of adjacent grounds residing alongside the road. It will protect the top soil for future growth of crops and aid vegetable farming. •The participants have expressed their greater interest for this intervention and believes this will bring nothing but prosperity for the entire catchment dwellers. •Household boundary fences along the road should be affected while construction • Nearly trees should be harmed for preparation of this road, however, some trees will fall for this intervention at several locations, around 15 trees. • Available pathway to usher material delivering vehicles • Labor shed availability in the target location • Identification of material storage	•They considered small lumbering and suggested tree plantation initiatives. •They also requested to involve the local community to construction work and they will welcome any outside key labor. •During construction period, alternate route to pass through this area is available. •Since the road is passing alongside homestead gardens and agriculture fields, the intervention will invite air pollution on moderate level during construction period. However, preventive actions and measures can be taken to keep air quality from degrading. • Women should be recruited equally, wherever possible. •Participants, made certain that they will provide surveillance over raw materials and material storage area. •They have also ascertained that the selected site is free from any events related to resettlement and major environmental impacts. The adverse environmental impacts that may come in the way of air quality, noise, solid waste, occupational health & safety during the construction period, and will be of short duration, yet proper management/conservative options should be adopted. •Existing private land of Md. Monjur Alom and Jafor Master in West Sonaichori village is an open space to settle material storage and labor shed alongside the road.

Table 2.3.2: Consultation Meetings Summary

Road Package Number	Date DD-MM-YYYY	Venue	Main Participant Groups	No. of Participants	Remarks (If any)
W23-6	27-01-2020	West Sonaichori Siraj Store	Host Community	17	The local individuals, elites, chairman and/or member of respective Union Parishad, representatives from different agencies participated in those consultation events.

3. ENVIRONMENTAL SCREENING

3.1 General

This section identifies the potential impacts that the various elements of the proposed Project may have on the physical, biological and socio-economic environment within half a kilometer of the radial distance around the site. Environmental Assessment (EA) based on this screening study for the Sub-project has been conducted to identify and determine which potential Project impacts may be significant and therefore require the application of reasonable and effective management and/or mitigation measures.

In order to realize the exact physical, biological, socio-economic and environmental impacts of the proposed sub-project sites and the influence area in regards to the implementation measures, an extensive field visit was carried out in each proposed sub-project PIA. Environmental Screening form, as adopted in **Appendix 2** of the Environmental and Social Management Framework of EMCRP, was administered for identifying the impacts and their extents.

The screening data and information for this sub-project component and details screening summary have been formulated and shown in **Appendix-01.**

3.2 Major Findings

A complete view of current environmental conditions of individual sub-projects in relation to interested queries has been congregated in order to understand the degree of impacts corresponding with marked interventions. Interestingly, most sub-project has correspondence with its surrounding features and upholds interchangeable impacts. However, the degree is not an interchangeable factor since scale is not parallel to each of these components which is where, mitigation measure differentiation is implied. There are some cases where unique circumstances have been met with while environmental screening took place which is also accounted for and should be a matter of concern for other parts of the ESMF initiative. The significant issues observed this sub-project component is enlisted in following Table 3.2.1 with pertaining impacts. Moreover, impacts that are adventitious has also been embraced for promoting best practices.

Table 3.2.1: Concerning environmental issues relating to each proposed subproject and influence area.

COMPONENT'S NAME UNDER W-23.6	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
NORTH SONAICHARI-WEST SONAICHARI ROAD ID:422945018	It is not located within any major environmentally sensitive area.	It will not cause any severe negative effects to the environmental settings of the area neither to important environmental features.
	Construction period will induce air pollution while preparing for bitumen and loading-unloading raw materials. Impacts on air quality during the construction phase may turn to negative. The main impacts include dust generation from crushers, vehicles and the transportation of all types of construction materials.	It will invite waste production which may in turn cause minor air pollution due to deposited dust and airborne particles less than PM_{10}. Dust pollution may slightly suffocate photosynthesis however this can be minimized through regular water sprinkling as suggested in ESMP.
	Noise emission from construction machineries and equipment can cause nuisance to local residents and workers.	The ambient noise level might have potential to increase temporarily and intermittently in the close vicinity of active construction fronts.
	Agricultural land, chorra, bushes and significant vegetation coverage is located in the ROW or does it stand over such items. However, shops, electric pole, trees, boundary fences and homestead gardens are found beside the road.	No agriculture land or any forest coverage will get degraded or lost for construction. Liquid waste such as left-over oils or chemicals might run into these adjacent features.
	Construction works will involve biological usage and preparation of on-site add-ons to the road. Generating scraps and residues.	The runoff from work site may enter existing water body and frustrate the water quality which will be acute however.
	Few amounts of bushes (sapling) clearings may need cutting at different chainage.	No severe damage will occur or damage to habitat will be faced. It can be managed by introducing small plantation incentives around the proposed location.
	Elephant Movement is not present in the vicinity of the subproject location.	N/A
	No heavy earth excavation work will be involved.	Consequently air, noise and dust pollution will be occurred within a small-scale during construction period only.
	Construction related activities and setting up of labor camps along with associated facilities and their management can cause adverse impacts.	Noise pollution from mixing or grinding, air pollution caused by dust or gaseous emissions from vehicle movement, running of motorized equipment and land clearing, odors and soil pollution from leaking of latrines and fecal sludge, will more likely to take place.

COMPONENT'S NAME UNDER W-23.6	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
	Chemical spills or improper disposal of construction waste materials due to lack of worker training and misconduct of contractor's safety initiatives.	During the construction period, soil may get contaminated from activities such as handling of hazardous construction materials (such as fuel, lubricants, paints, and solid waste and sewage).
	Vibration effects generated from mixing, grinding, pilling, drilling or other construction works	Any vibration would result in nuisance effects to nearby faunal species, and but will be localized and temporary and will unlikely to result in structural damages to buildings or walls of the adjacent private properties.
	Sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site are at north side West Sonaichori mosque (30m), Reju Khal (400m), Pachardwip hill (500m), at south side Playground (400m), Kalarghona hill (800m), Jaliapalong- Sonaichori Mosque, Madrasah & graveyard (20m), at east side South Sonaichori jame mosque & graveyard (600m), Sonaichori GPS (150m), Jaliapalong High School (150m) and at west side Sonarpara bazar (850m), Jaliapalong UP (600m), Sonarpara central mosque (1km).	No disturbance to all these establishments/features is anticipated due to construction activities for the sufficient distance from the construction site, and strict construction site management system- including restrictive work schedule during the daytime only, water-sprinkling twice a day on and around the site, safe storage of materials, etc.

A few incidents of human elephant conflict have been reported in 2018. The IUCN has conducted a study on such conflict. With the support from UNHCR, IUCN has been marking elephant routs and corridors and informing local communities and stakeholders of avoiding the marked areas. As part of the mitigation options, different initiatives have been undertaken, such as formation and capacity development of Elephant Response Teams (ERTs); providing equipment to ERTs to divert in-coming elephants; and setting up elephant deterrent tools (e.g. trip alarms and watch-towers). Though the current chances of occurrence of conflicting incidence are zero, any recurrence would be managed by the ERTs and they will be called if there appears any minute possibility to recur. A map of elephant movement is given in Annexure 04.

In order to offset the loss or attenuating the environmental degradation, a set of mitigation measures will be adopted, on top of general practice of standard construction procedure or following the relevant codes of practices.

3.3 Climate Change Impact Screening

3.3.1 General Overview of the area

Cox's Bazar is one of the coastal districts of Bangladesh and is prone to the effects of climate change due to its geomorphological siting and climate induced effects. The hilly tracts of Cox's Bazar could foster further environmental crisis brought on by indiscriminate deforestation and diminishing groundwater reservoirs, which have been taken place in recent months as the Rohingya crisis evolved. A recent study conducted by World Bank[3] has found that Cox's Bazar will be the worst-hit district in South Asia as average temperatures rise and rainfall patterns become disruptive, by 2050, if greenhouse gas emissions continue unabated.

The hilly region of the country, especially the part in Cox's Bazar is characteristically of muddy soil structure, not of any rocky formation and the stability comes from the roots of the trees. Also rainfall, proximity to the sea, elevation, and land cover are very important factors for analyzing the risk of cyclone. Denudation of trees from hilltops in order for the huge settlement of Rohingya people has already increased the vulnerability to the risk of hill collapse by destabilizing the terrain. Also deforestation at a rapid speed uncovers the land and raise the risk of occurrence of cyclones, as forests protect land from high wind and storm surges where demolishing the trees would make the area vulnerable.

Together with the above-mentioned hazardous situation, again due to sudden extraction of huge amount of groundwater, availability of potable water from shallow tube wells that pump water up from about 150 feet has already reached to a critical level. Averting the problem requires new tube wells to be plumbing deeper into the poorly mapped aquifer, but going deeper than 700 feet in some places may cause salt water to contaminate freshwater resources.

In this case, it is possible that a stationary position of the freshwater-saltwater transition zone can be established via proper management of pumping in the confined aquifer.

The groundwater resource is seen to suffer more from the climate change impact. The impact on groundwater due to climate change impact include

- Sea-level rise could result in a transgression of the sea and a loss of land area. This could also lead to the secondary effect of population migration in the new coastal band due to migration of the coastal population from the encroaching sea, thereby increasing domestic water needs in the new coastal area.

- Transgression of the coast implies that saline storm surges of 1 or more meters depth would penetrate beyond the new coast to new land areas. Storm surges transport saline water far inland of the coast and much of this floodwater may infiltrate the ground in areas where the aquifer is not fully saturated. Even where the aquifer is saturated, denser saline water may

[3] https://openknowledge.worldbank.org/bitstream/handle/10986/28723/9781464811555.pdf

sink into the aquifer during the flood and later from pools of saltwater that remain following the flood[4].

- It has been identified that the salinity is found in the shallow aquifers along the coastline. So the salinity which are found in the groundwater are of lesser concern as salinity will subside over time

- Several researches show that through modeling of groundwater flow that the depletion of groundwater in the host community will persist up until 2022 and the replenishment of water will take place.

Considering the general climate change effects in Cox's Bazar area and offsetting the aggravating environmental situation due to the mass arrival of Rohingya communities, several specific measures including tree planation in sub-project areas, rainwater harvesting from every disaster shelter, construction of drainage facilities along the road length and installing thunder arrester across the areas, have been suggested and will be implemented.

3.3.2 Site Specific Screening and outcome

Climate Change impact on a particular subproject is tough to deduce as the highest resolution of climate model simulation done over Bangladesh is 50km. Depending on the simulation ensemble of Cox's Bazar district, the temperature and precipitation are likely to increase with time.

Site specific climate change impacts are often not so easy to measure or deduce plausibly while the site is confined to a narrow strip of roadways, and associated mitigation or offsetting measures are really hard to plot on the impact areas, though an overall set of measures are often considered in practical aspect. Fig:1 shows the inundation risk map of the subprojects under W-23, none of the subprojects are in vicinity of the severe river flood inundation area. So the risk of flooding is low around the sub-project area

[4] "Implications of Climate Change for Fresh Groundwater Resources in Coastal Aquifers in Bangladesh", World Bank report.2010

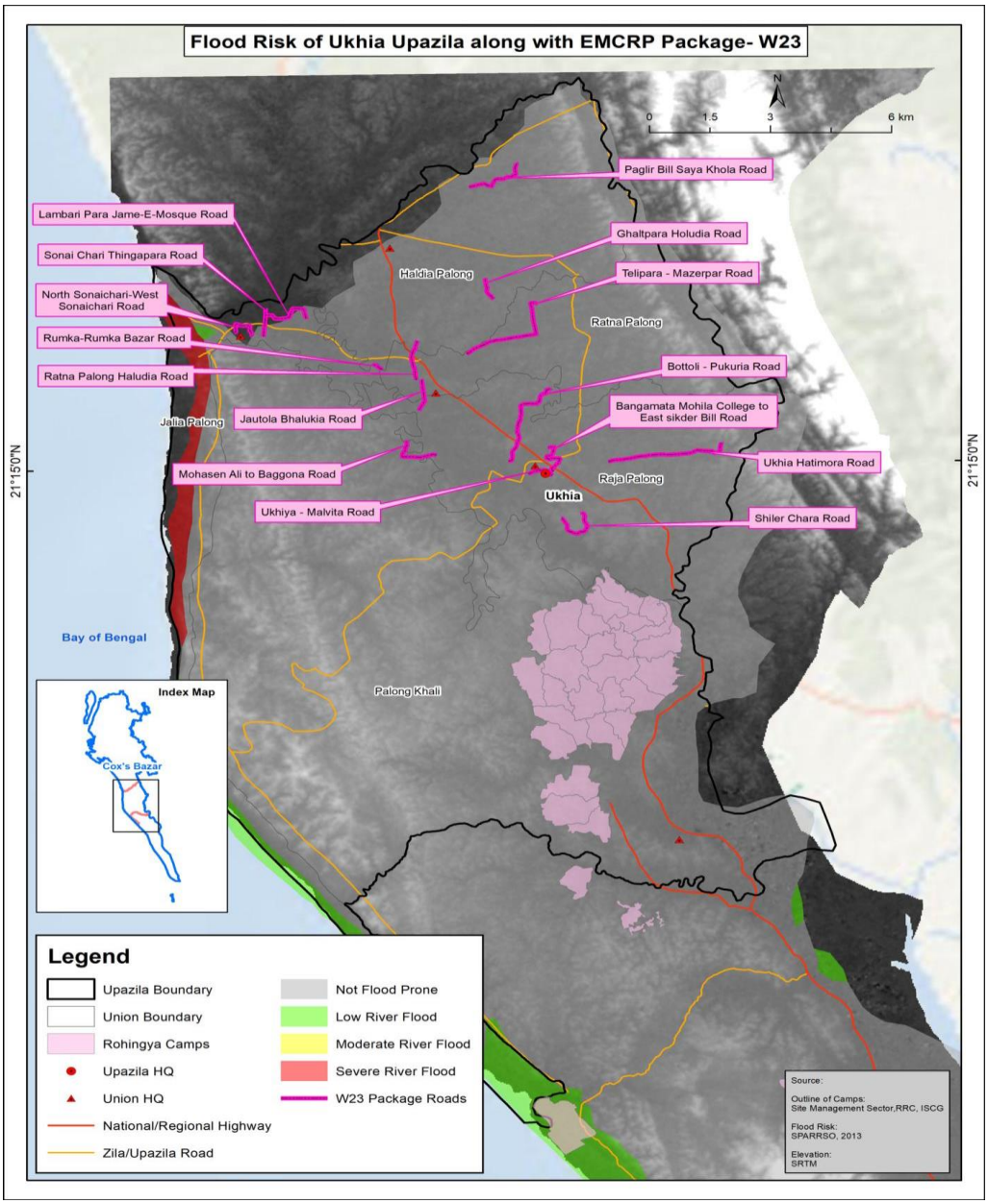


Figure 3.3.2.1: Flood inundation risk map near the subprojects.

Also, in order to avoid the devastation caused by the thunderstorm, state-of the-art thunder arrester (lightning protection system) has been suggested to install having a coverage area of 25,434 sq.m for a single arrester. In addition, tree planation on the road slope/ within the premises is also suggested to sooth the temperature effect and increase the water retaining capacity of soil, at the same time.

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

4.1 General

Considering the environmental settings of the sub-project area, it can be assumed that possible impacts would be largely construction-related, and could be addressed through adoption of good engineering practices; good housekeeping; better *in-situ* construction materials management; and observance of health and safety protocols during the implementation period.

Table 4.1.1: Site Specific Impact and Mitigation Plan under package W23.6

Component's name under W-23.6	Impacts	Mitigation plan
North Sonaichari-West Sonaichari Road Id:422945018	West Sonaichori mosque (30m) to the north and Jaliapalong- Sonaichori Mosque, Madrasah & graveyard (20m) to the south. Further, some settlements located adjacent to the sub-project area might get affected during the construction period with the generated debris and dust, though for the time being.	Contractor must adhere to the best practice debris management procedure and regular adoption of dust control measures (spraying of water at least twice a day) to minimize the effect to the level best.
	Proposed subproject area arises water logging problem during the monsoon sometimes. On the other hand, some part of the proposed road is passing by the agricultural land. Box culvert and cross drain will be constructed to terminate rainwater for one side to another side during rainy season and also help for rapidly remove excess soil water to reduce or eliminate waterlogging during monsoon and return soils to their natural field capacity and will help to maintain the water balance of both roadside agricultural land to provide a sustainable irrigated agricultural system. It will also help to prevent flood and not to allow water to overflow and also help to divert water for farming. Some low land is found beside the proposed road so protection wall and palisading work will be constructed during construction period for used to "correct" the natural slope. There are points on the road where slope preparation cannot be done due to having low lying agriculture lands and water bodies. Slope preparation refers to resettlement issues as well in those locations. In such cases Toe Wall is proposed which helps to restrain the horizontal surface pressure. This is an adaptation technique and a precaution measure to not allow any damage to sideline existing low-lying features. There are low lands along the road where agriculture fields and ponds are present. This also excludes high chance of soil quality degradation.	Proposed safety structures are **06 nos. Cross Drain** (dimension: 0.975mX 0.975m) at different chainage and **01 no. Box Culvert** (dimension: 2.0mX2.0m) at Ch. 362.0m of chainage, **281.0m Toe wall** and **25.0m Palisading work** at different Chainage, **Earth** works, **Road safety** works and **Environmental Mitigation and Enhancement** works.

Further construction related activities which may result in adverse impacts in the surrounding environment of the sub project component must be kept under close consideration and appropriate mitigation and management measures will be taken with due care and vigilance. Once the effects are minimized to its least level and controlled efficiently, it will turn into a welcoming and beneficial project for the local communities. The specific environmental

management plans have been outlined in **Appendix-2**. The mitigation measures as well as monitoring program of ESMP have also been incorporated in the management plan.

Environmental quality enhancement: Under the additional financing to the EMCRP project, Forest Department of the Government of Bangladesh will afforest along 200 km of road length area, primarily under the Ukhiya and Teknaf Upazila of Cox's Bazar district in order to offset the environmental and ecological devastation, that had been occurred due to the evolution of Rohingya Crisis, to an achievable level. Many of these road lengths will go through and by the Rohingya Camps, up on the hill and are already denuded of trees or vegetation. Local Government Engineering Department (LGED) will allocate and channelize the finance to the Forest Department under the said additional financing component and oversee the progress of works with due diligence. However, this enhancement work will improve the environmental quality of the area and reinstate some parts of the ecosystem services to those areas, though primarily.

4.2 Health and Safety Measure under COVID Situation

Apart from the established Occupational Health and Safety (OHS) measures being followed in construction sites, offices, and labor camps, a set of additional measures has to be taken and practiced throughout the daily cycle by each labor, staff and any involved parties, due to the ongoing pandemic coronavirus situation. Staffs and consultants at PIU and D&S, along with the pool of consultants under different firms/agencies for different services, and all the representatives or staffs of construction contractors and suppliers have to play much sensitive, (pro-) active and responsible roles in abiding by the rules and measures by themselves and getting the involved workers and different stakeholders adhered to the same. A detailed guideline containing a set of measures with shared responsibilities has been sketched out in order to fight the exposure and further spread of this potentially fatal situation. This plan or guideline shall constitute an integral part of ESMP measures for every sub-project, though is not included in this report to keep it concise and specific, and the contractor is required to keep the copy of that guideline at every site office.

However, among many other relevant issues, the guidelines emphasize on following line of directives:

a. Contractor must designate one of his employees as H&S/Safeguards supervisor to lead, coordinate and interface in order to fight the COVID 19 situation under the direct guidance of COVID focal at PIU of EMCRP project.
b. All workers, supervising and supporting engineers and staffs, consultants, service providers and other concerned parties must adhere to the personal health and hygiene rules, social distancing, and other protective measures in full in order to protect themselves and contain the infections any further. Necessary training and awareness campaign will be aligned with the specific sub-project scenario and prevailing conditions.
c. General practice of cleaning and hygiene has to be maintained in all project/site offices and camp sites, and supply of necessary PPEs and cleaning /disinfecting materials along with proper use of those is to be ensured.
d. Public consultation and stakeholder engagement are to be carried out considering the prevailing risks of virus transmission in the target areas, scope of interventions and level of ICT penetrations among the target stakeholders, and so on.
e. Necessary protocols have to be established and maintained in case of handling a sick employee or worker, and appropriate compensation to a sick disengaged labor is required to be given with due documentation.
f. Budgeting for suggested protective measures, along with necessary supervision and monitoring for the required interventions has to be ensured.

Following the additional health and safety measures presented in that guideline, sub-project component specific BOQ items have been inserted to supplement the budget considering the country-specific situation, capacities, and scope of interventions. The additional cost to Health and Safety Measures under COVID 19 situation is shown in **Appendix-3.**

4.3 Cost of Environmental Enhancement Works in BOQ

In consideration to the above-mentioned environmental impacts and their mitigation measures for this sub-project component, a set of items are included in the BOQ of this sub-project component. Social Safeguard Personnel for Environmental and Social Management for Work Package EMCRP/W23 has also been added in the whole BOQ in order to take supervision and leadership to organize Environmental Management under Environmental Enhancement Works. The total costing and estimation have included enhancements such as Grass turfing plans, Tree plantation initiatives, Dust Suppression mechanisms. On the other hand, in order to ensure health safety and sanitary measures of workers PPE, First Aid Box, Labor shed, Environmental management, drinking water facility with water tests, Temporary latrine for both male and female as well as waste disposal systems has been accounted for. Ensuring sustainable labor performance in regards to environmental and social considerations motivational training has been taken into account. An overview of the estimation is given below and the detailed estimated cost to implement the ESMP is shown in **Appendix-3**.

5. LIMITATION OF THIS STUDY

Bangladesh government has imposed a nationwide lockdown to curb the spread of the novel coronavirus in the wake of series of deaths and infections. Authorities declared a ban on passenger travel on all sector from March 24 while all public transport on roads have been suspended from March 26 to stem the spread of virus, officially known as COVID-19. All office works have been postponed and an intended visit to the sites for further consultation with the relevant stakeholders has had to cancel due to this crisis. Therefore, some relevant information and arrangement needs awaiting for recovering this pandemic crisis.

6. CONCLUSION AND RECOMMENDATIONS

The overall conclusion is that if the mitigation, compensation and enhancement measures are implemented in full, there will be no significant negative environmental impacts in regards to the selection of location, design, construction, and/or operation procedure of the proposed Sub-project. There will in fact be tremendous benefits from recommended mitigation and enhancement measures and major improvements in quality of life, opportunities in business, trading jobs and ensuring social safety and security will be achieved once the scheme is in operation.

The conclusions of the Screening study can be summarized as follows:

- The communities will receive large benefits through improved infrastructural facilities, transportation & communication etc.
- The short-term negative impacts that may come by the way of air quality, noise, solid waste, occupational health & safety need to be minimized through the management plan.
- The project will create employment for those who live in the vicinity of the construction site and will provide them a short-term economic gain.
- The green belt development, if necessary, for the road site, with large-growing trees at the periphery of the site will give the places a more natural and pleasing appearance.
- A comprehensive Environmental and Social Management Plan (ESMP) has been prepared to mitigate and reduce the adverse impacts that will come out from the Subproject activities.

Implementation of this Sub-project will have large positive impacts to the communities in terms of improved infrastructural transportation & communication facilities, which would eventually develop the socio-economic condition of the catchment areas. So, strong recommendation should be put in place to implement the sub-project within shortest possible period of time, and with great care and efficiency.

Annexure-01: Important Environmental Features (IEFs) near site:

Detail Environmental features within 100m of the both sides from the center line were collected @300m longitudinal intervals. The findings of the survey for the aforementioned road can be seen in the table below:

Table: Detailed Chainage length and feature of the Sub-Project component

Road Name	North Sonaichari-West Sonaichari Road Id:422945018 **(W23-6)**	**Total Chainage**	945.0m

Chainage (m)	**Left**	**Right**	**Features**
000-300	L		Shop, paddy land, household connecting roads, wire fencing, bamboo fencing, betel nut garden
		R	Shop, tin shed household, betel nut garden, paddy land, building, wire fencing, paddy land
300-600	L		Paddy land, culvert, bamboo fencing, sugarcane garden, bamboo fencing, betel nut garden, coconut trees, pond, bamboo fencing, tin shed earthen household, household connecting road
		R	Paddy land, big mehegoni tree, paddy land
600-945	L		Bamboo fencing, betel nut garden, Rejur chorra (8m), bridge, bamboo fencing, household, tin shed earthen household, tin shed fencing, brick boundary wall, building, bamboo fencing, betel nut garden, brick boundary wall, household connecting road, wire fencing, tin shed fencing, settlement, mosque
		R	Vetabkles garden, net fencing, bamboo bushes, betel nut garden, open space, bamboo fencing, Reju chorra, bamboo bushes, bamboo fencing, electric pole, betel nut garden, bamboo fencing, earthen household, tin shed fencing, building, pond

Annexure-02: Attendance of consultation meeting

EMCRP/23.6

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)

স্থানীয় জিডিতে রোহিঙ্গা সংকট মোকাবেলায় মাল্টি সেক্টর প্রকল্প

Local Government Engineering Department (LGED)

Public Consultation Participants List

Focus Group Discussion

ক্রঃ নং	নাম	বয়স	পুরুষ/মহিলা	গ্রাম	স্বাক্ষর / টিপসই
০১	তমসু আক্তার	২২	পুঃ	লোনাই চুড়ী	
০২	রফিক উদ্দিন	২৮	ঐ	ঐ	
০৩	আলমগীর	৩৩	ঐ	ঐ	
০৪	আব্দুল কাসেম	৫২	ঐ	লোনাই চুড়ি	
০৫	[illegible]	৪০	ঐ	পাহাড়ের [illegible]	
০৬	মনজুরুল আলম	৪২	ঐ	ঐ	
০৭	নুরুন নবী	৪০	ঐ	ঐ	
০৮	রোখসানা বেগম	৬০	মহিলা	ঐ	
০৯	[illegible]	২৬	মহিলা	ঐ	
১০	[illegible]	২৭	মহিলা	ঐ	
১১	[illegible]	৩২	পুরুষ	ঐ	
১২	[illegible]	৪৫	মহিলা	ঐ	
১৩	[illegible]	২৫	ঐ	ঐ	
১৪	[illegible] 01572-4[illegible]	৪৬	পুরুষ	লোনাই	
১৫	[illegible] ০১৪১২৩৩৫৩৪৭	৩০	পুরুষ	লোনাইছড়ি	
১৬	[illegible]	৪৫	ঐ	ঐ	
১৭	[illegible]	৪৫	ঐ	ঐ	

Figure: Attendance of consultation meeting for W23-6

Annexure-03: Pictures of sub-project component location and surrounding features with public consultation



Starting point of North Sonaichari-West Sonaichari Road



Missing brick bone from the proposed road



Sugarcane yard and paddy land besides the road



Consultation meeting with local community

Figures: Present condition of North Sonaichari-West Sonaichari Road (W23-6) & Public Consultation meeting with Host community

Appendix-1: Environmental Screening Form for examining sub-project component

Environmental Screening Form for Sub-project W20-6

Sub-Project Description Form:

Name of Sub-Project: (Improvement of 15 Roads with culverts and side drain under Cox's Bazar District. EMCRP/W23).

Name of the component: North Sonaichari-West Sonaichari Road Id: 422945018

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Estimated total cost of sub-project (in Taka): 417,036,298.10 Tk.

Estimated construction period duration: 1 year

Estimated total cost of the component (in Taka): **18,561,940.23**

Estimated Operation and Maintenance period (life of sub-project): Project design life more than 15 (Fifteen) years but Government policies on how long projects can operate in the camps.

District: Cox's Bazar **Sub-District**: Ukhiya **Union**: Jaliapalong

Name of Community/Local Area: West Sonaichori

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):

The Sub-Project is categorized as a village road and improvement with Bituminous Carpeting (BC) options. For drainage of rain water **06 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 168.0m, Ch. 470.0m, Ch. 515.0m, Ch. 565.0m, Ch. 607.0m & Ch. 879.0m of chainage and construction of **01 no. Box Culvert** (dimension: 2.0mX2.0m) at Ch. 362.0m of chainage. Due to the low land in different chainage for protection work of the road **281.0m Toe wall** and **25.0m Palisading work** at different Chainage will be constructed as well as for **Earth** works, **Road safety** works and **Environmental Mitigation and Enhancement** works has been included in the estimation.

Estimated footprint / land area for this sub-project is 4,630.5 sqm.

Brief description of sub-project site: (e.g. present land use, Important Environmental Features (IEFs) near site, etc.:

This proposed North Sonaichari-West Sonaichari Road belongs to West Sonaichori village at Jaliapalong union, Ward-2 under Ukhiya Upazila. This sub-project is on flat land area. This road has started at West Sonaichori Siraj store stretching 945 meters from North side to South side (Courtbazar-Sonarpara-Marinedrive connecting road), along with paddy land, settlements, trees, bushes, homestead gardens, boundary fencing, ponds, chorra, electric pole etc.

Overall Comments

The proposed sub-project (Road improvement) is not located within any remarkable environmentally sensitive area and will not cause any severe affect to the environmental setting of the area thus not going to create intimidation to important environmental features. No drainage congestion/water logging has been observed in the road area. But, some local trees like betel nut, bushes etc., or additional vegetation may need to clear out due to construction activities, with appropriate offsetting measures to be taken. No agricultural productive soil will be used for the purpose. Earth will be compacted for stabilization. The inputs will be mainly at construction phase and limited within project boundary. Moreover, mitigation measures will be taken according to the ESMP for minimizing the air, dust and noise pollution.

It has been revealed that this project's scopes of works do not intend to overtake their area of lodgment and funding entity has no intention to do so. Moreover other issue has also been brought to their attention that drainage system and a bridge have also been included into the evaluation of this project since runoff from higher grounds are also a concerning matter during rainy season.

People of the subproject area are very much optimistic about the success of the project and are also eager to participate in the project activities. The subproject is environmentally sustainable and socially acceptable. The local community attended in the participatory public consultation meeting. Their community representatives as teachers, shop owners, farmers and elders have no objection to the construction this infrastructure in the proposed site; the community also appreciated the initiative of LGED to ensure safe access and better portability. The public consultation meeting results confirmed that improvement of this road will increase socio-economic interest in the communities and make lives easier for these people. They also requested to construct the road in accessible width so that small auto and motor vehicles can pass easily. Water flow from undulated terrains is a factor that should be considered for construction because 1 week worth of rain invites water flow which makes this surrounding area logged in several places. On another matter, locals requested to involve the local community to construction works and material storage monitoring duties.

The road is not located within any identified environmentally sensitive area, and therefore, does not seem to cause any adverse impact on the important environmental features. No significant impact is expected on the ecosystem and biodiversity, no agricultural land/ activities or fish farming will be disturbed, due to the construction of the sub projects. Only forest is found as homestead forest on high grounds of the location.

Types of waste to be generated during construction and operation phase:

During construction period solid waste will be generated due to construction activities. The types of wastes are brick pit, unused sand, wood, gravels, bitumen etc. The types of wastes are gravel, stones, rock, wood, copper wires, concrete, iron, plastic etc. Negligible amount of plastic will come as residue. Moreover, liquid waste will include chemicals of bitumen leftovers, motor oils, used oil, Degreasing solvents etc. Human wastes and kitchen wastes will be generated from labor camps as well.

Sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site including elephant migration routes and remaining forests:

Within the influence area of the subproject no historical sites were identified. This sub-project is situated within West Sonaichori village under Jaliapalong union, Ward-2 of Ukhiya Upazila, Cox's Bazar. Some sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site are at north side West Sonaichori mosque (30m), Reju Khal (400m), Pachardwip hill (500m), at south side Playground (400m), Kalarghona hill (800m), Jaliapalong- Sonaichori Mosque, Madrasah & graveyard (20m), at east side South Sonaichori jame mosque & graveyard (600m), Sonaichori GPS (150m), Jaliapalong High School (150m), pond (500m) and at west side Sonarpara bazar (850m), Jaliapalong UP (600m), Sonarpara central mosque (1km). Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists.

Some human settlements and agricultural land are found around the sub-project area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). Elephant migration routes were about 14-15 km away from this sub-project. No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below:

Section A: Sub-Project Overview

Description of sub-project/component interventions:
The Sub-Project is categorized as a village road. Based on field survey, this sub-project involves of Brick Flat Soiling (BFS). According to the design this sub-project will be improved with Bituminous Carpeting (BC) from Ch. 00m to Ch. 945m.

Subproject interventions:

- **Bituminous Carpeting (BC)** options.
- **06 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 168.0m, Ch. 470.0m, Ch. 515.0m, Ch. 565.0m, Ch. 607.0m & Ch. 879.0m of chainage
- **01 no. Box Culvert** (dimension: 2.0mX2.0m) at Ch. 362.0m of chainage
- **281.0m Toe wall** at different chainage
- **25.0m Palisading work** at different chainage
- **Earth** works
- **Road safety** works and
- **Environmental Mitigation and Enhancement** works (description of such items can be found in BOQ)

Sub-project Location:

Important Features	
ID	422945018
District	Cox's Bazar
Upazila	Ukhiya
Union	Jaliapalong

WARD	02
Total Chainage	945m
Proposed Chainage	945m
Road Type	Village Road
Proposed Intervention Type	Bituminous Carpeting (BC)
Road Starting Point Coordinates	Latitude: $21^0$17'08" N Longitude: $92^0$03'54" E
Road Ending Point Coordinates	Latitude: $21^0$17'3.99" N Longitude: $92^0$04'9.2" E

Land ownership

Land is owned by Government.

Expected construction period: 1 year

Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water bodies, etc. and historical or socio cultural assets): Please also explain any analysis on alternative location was conducted:

Some existing significant involvements within the project influence area are at north side West Sonaichori mosque (30m), Reju Khal (400m), Pachardwip hill (500m), at south side Playground (400m), Kalarghona hill (800m), Jaliapalong- Sonaichori Mosque-Madrasah & graveyard (20m), at east side South Sonaichori jame mosque & graveyard (600m), Sonaichori GPS (150m), Jaliapalong High School (150m), pond (500m) and at west side Sonarpara bazar (850m), Jaliapalong UP (600m), Sonarpara central mosque (1km).

Within the influence area of the subproject no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (checked with local IUCN representative).

Section B: Environmental Screening

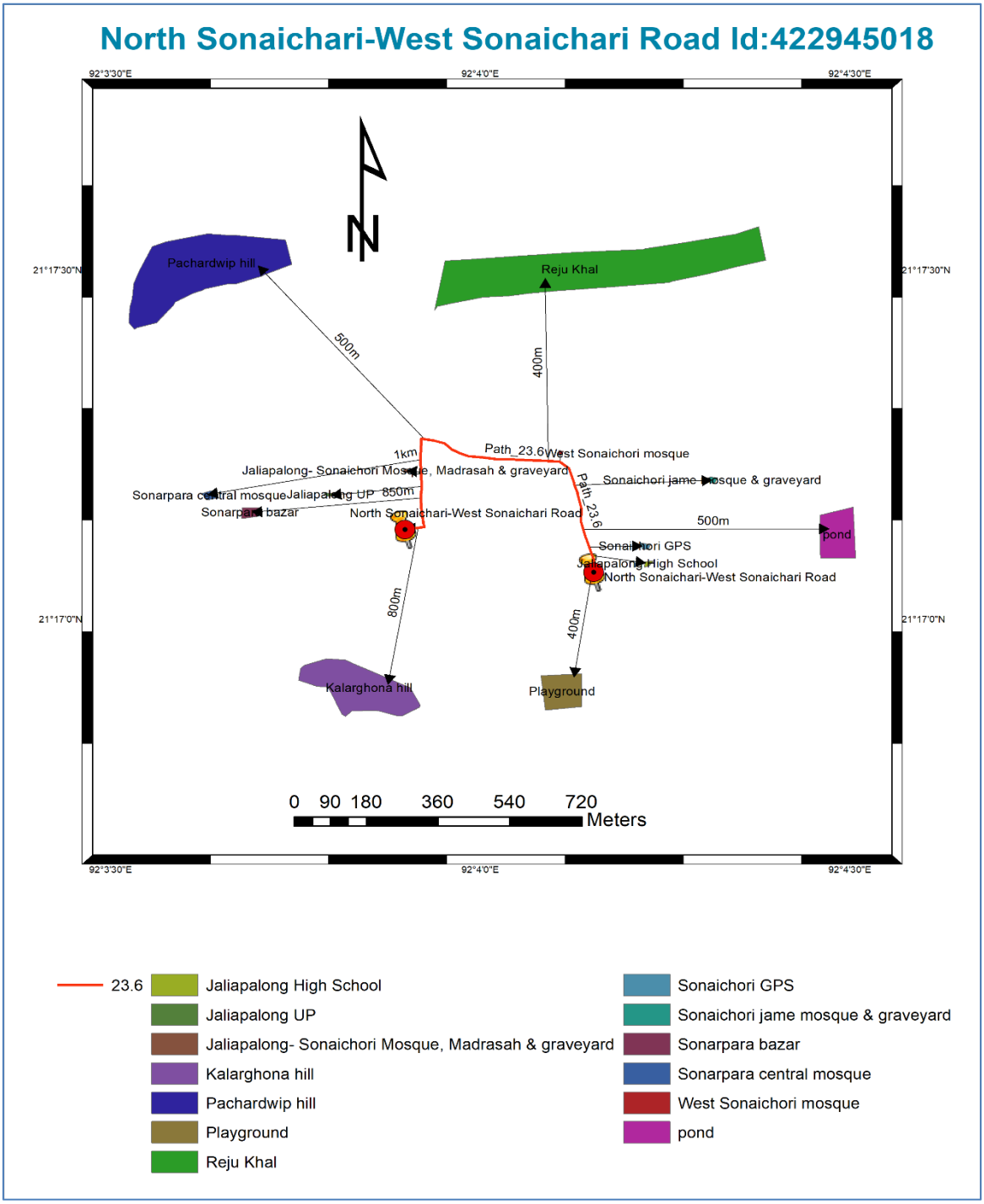
***B.1*: Environmental feature of sub-project location**

Description of cultural properties (if applicable, including distance from site):
Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests:

Sensitive environmental, cultural, archaeological, religious sites within 1 kilometer of site including at north side West Sonaichori mosque (30m), Reju Khal (400m), Pachardwip hill (500m), at south side Playground (400m), Kalarghona hill (800m), Jaliapalong- Sonaichori Mosque, Madrasah & graveyard (20m), at east side South Sonaichori jame mosque & graveyard (600m), Sonaichori GPS (150m), Jaliapalong High School (150m), pond (500m) and at west side Sonarpara bazar (850m), Jaliapalong UP (600m), Sonarpara central mosque (1km). Apart from this structure no other sensitive

environmental, cultural, archaeological, religious sites exists.

A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas are shown below.



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive features found in the footprint area, except matured vegetation on the sides of the road which are homestead gardens and forest. Several mosques, shops and local settlement were found during the survey. It will not be affected by the

construction works, as the activities will be carried out within the existing subproject boundary and necessary preventive and mitigation measures will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*

No. There is no existence of Elephant corridor/ route now, which have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) potential impacts on remaining forests in/around camps Yes/No
N/A (This activity will be confined within the existing subproject boundary)

(3) Other issues: N/A

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:

Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of vehicle-related pollutants 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/ preventable by mitigation measures.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, tractor, trailer, etc. move on roads adjacent to sub-project throughout the day and night generate noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation):

Landslide potential is low. There is low possibility of soil erosion or landslide during construction period of targeted sub-project. The impacts are negative but very small scale, site-specific within a relatively small area and adjustable by mitigation measures.

Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH): Groundwater is the main source of potable water in the Sub-project area. The shallow depth is about 60 feet to 70 feet and deep tube well depth is 700 to 800 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 600-800ft (Field survey, 2019). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer. Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)
Status of wildlife movement: N/A (None of the information was found about the wildlife movement in or across the area)
State of forestation: Patches of vegetation containing large and matured trees across the road side of the proposed subproject area are located within 200m radial distance.
Summary of water balance analysis (For water supply scheme only): N/A

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g. status of access road or any other facility required for sub-project to be viable): A bituminous carpeting (BC) road called Sonarpara-Courtbazar connecting road is available for access. It is possible to carry the construction materials on this road to the construction site with limited traffic flow since this road has small corridor to pass large vehicles.
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction: Toilet and water supply facilities will be ensured by the contractor in the vicinity of the construction area for all the components of the sub-project, electric connection will be established with the accommodation facility due for the workforce. Electricity is available in the area.
Possible location of labor camps: Labor camp can be established along the road since there are available open private lands of West Sonaichori Monjur Alom's and Jafor Master. However, this will have to be done with the consent of land owner under a mutual agreement, with the supervision of the Engineer in charge.
Requirement and type of raw materials (e.g. sand, stone, wood, etc.): i) Bricks ii) Sand iii) cement iv) Gravel v) water vi) Aggregates vi) steels vii) Bitumen are the most

common type of road materials used in construction.
Identification of access road for transportation (Yes/No): Yes. A BC road called Sonarpara-Courtbazar connecting road is available for access.
Location identification for raw material storage: Adjacent to labor camp or different location is available. However this will need placement on open fields and should be consulted with local committee. Material storage area must be well fenced and materials will be covered with tarpaulins.
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.): Earth/ mud, plastics, brick chips, cement dusts, dust from bricks, bitumen, during construction which can be identified as solid wastes. Also, sludge will be produced from labor camp latrines and kitchen waste mostly composing of organic matters as fiber, starch, carbohydrates and proteins. 10% of the kitchen waste may be classified as plastics or non-biodegradables. Solid waste may amount to 25kg daily and sludge may amount to 5 kg per day.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g. Solids wastes, liquid wastes, etc.): **Solid waste:** Residual waste from the labor camps will be generated. Equipment maintenance/vehicles on-site and scrap material will occur during construction works which are mostly solid waste. Leftover oils or spills from machinery can be a high probability generating liquid waste. Waste from civil works. And the quantity will be tentatively 150 kg. **Liquid waste**: During construction period fecal sludge will be generated from the labor camp and the quantity would be nearly 6 kg per day, which would be reduced in weight in course of time. Leftover oils or spills from machinery can be a high probability generating liquid waste.
Type and quantity of raw materials used (wood, bricks, cement, water, etc.): **Type:** i) Bricks, ii) Sand iii) cement iv) aggregates v) water vi) concretes vii) Bitumen are the most common type of road materials used in construction. **Quantity**: It is difficult to give exact figures of construction waste produced on a typical construction site.
Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards: No such vegetation is present in the right of way. Specific soil amount is not needed for the project. The current condition explains that there is no aggregated soil on the right of way.

Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) The possibility is Medium, for stagnant water bodies to occur. Because water usage will be higher during the construction period. By default, this area has no water logging troubles due to being natural channels. Moreover, no possibilities of stagnation of water in long run. So, local communities have stated that they do not have severe troubles with mosquitos or other disease vectors.
Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No pre - existing drainage channel is found.
Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. Because under this interventions, there is very little scope of damage to terrestrial or aquatic ecosystems or endangered species.
Activities that can lead to landslides, slumps, slips and other mass movements in road cuts: Scope of work leading to low scale effects of landslide. The impacts are negative but short-term and site-specific. It can be managed through mitigation measures.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description) Low, since both sides of the road is more or less similar elevation. The concentrated outflow will be managed since the sub-project has included drains.
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: No
Chance of long-term or semi-permanent destruction of soils: (High/Medium/Low with description) No
Possibility of odor and water, soil quality impacts from SWM and FSM disposal system: (High/Medium/Low with description)

No
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) There is no possibility of stagnant water bodies remained for encouraging mosquito breeding and other disease vectors, during the operation phase.
Likely direct and indirect impacts on economic development in the project areas by the sub-project: Construction or implementation of a road project substantially contributes to the development of the project areas. It surely improves the communication network, reduces the transport time, increases the trade and business in/around the areas, and ensures access to better living conditions with amenities, better educational and job opportunities and health facilities. Thus, the direct and indirect impacts on economic development in the project areas would be enormous by this sub-project.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No existing drainage channels or surface water bodies found in the project area, therefore, no such effect can be anticipated
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. There are no protected areas in or around project sites, and no known areas of ecological interest.
Activities leading to landslides, slumps, slips and other mass movements in road cuts: The entire sub-project component area is nearly flat; thus, no such type of impacts is anticipated.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) No
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: Improved communication will definitely increase the traffic/ vehicular movement, which must increase the light and noise pollution, but air pollution effect will not be increased significantly, as the proposed BC road will reduce the pollution generated from dust on the muddy road, especially during the dry season and if the vehicles are maintained in good conditions

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

Section D: Environmental Screening Summary of the Work Package-23.6

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
1: Sub-Project Interventions	**Air quality**	Under the subproject intervention the overall score is **low**.	• Limiting earthworks; • Watering of dry exposed surfaces and stockpiles of aggregates at least twice daily, as necessary; • Requiring trucks delivering aggregates or bricks and cement to have tarpaulin cover and Limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Covering of trucks; • Records of air quality inspection;	Visual monitoring of air quality and if requires, air quality test (CO, $PM_{2.5,10}$) once in construction period in winter season.
	Soil impacts	Under the sub-project intervention the overall score is **low.**	• Precautions might be taken when rainstorms are likely, when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms. • The earthwork sites where exposed land surface is vulnerable to runoff shall be consolidated and/or covered. • The material stockpile sites shall be far away from surface water bodies and areas prone to surface run-off. Loose materials shall be bagged and covered. • Channels, earth bunds, netting, tarpaulin and or sand bag barriers	Construction Contractor monitored by Consultant and PIU	• No visible degradation to nearby drainages, • *khals* or water bodies due to soil erosion. • Rain storms in construction phase.	Monitoring as weekly basis.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
			shall be used on site to manage surface water runoff and minimize erosion. • The overall slope of the work areas and construction yards shall be kept to a minimum to reduce the erosive potential of surface water flows elsewhere.			
	Hydrology (surface and groundwater)	Under the subproject intervention the overall score is **low**.	• All precautions to store chemicals/oil/fuel properly so that no chance of spill. • Workers must specify waste dump locations to avoid littering which in turn might negatively affect surface and ground water. • Monitor water quality according to the environmental management plan.	Construction Contractor and monitored by Consultant and PIU	• Areas for stockpiles, storage of fuels and lubricants and waste materials; • Records of water quality inspection; Water Quality Test • (National Drinking Water Quality Standard Parameters)if requires; • No visible degradation to nearby drainages, *khals* or water bodies due to	Water quality test (mainly GW) twice during the construction period in six months interval.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
					construction activities. • Records should be kept and logged.	
2: Pre-construction Phase	**Sanitation, water supply**	Under the subproject intervention the overall score is **low**.	• Provide suitable housing, adequate supplies of potable water, and toilet and bathing facilities within labor camp area for the assigned laborer. • Provide means for disposing of wastewater from toilets, baths and food preparation areas either through a septic tank and soak away, or holding tank with removal by vacuum truck. • Records for any type of training or awareness building sessions must be kept at site.	Construction Contractor and monitored by Consultant and PIU	• Site-specific H&S Plan; • Records of supply of uncontaminated water; • Record of Health &Safety orientation trainings; • Condition of sanitation facilities for workers	Visual inspection by PIU and supervision consultants on monthly basis
	Transportation	Under the subproject intervention the overall score is **low.**	• Contractor should verify vehicles for the suitability of carrying, loading and unloading of materials	Construction Contractor and monitored by Consultant and PIU	• Record of regular inspection. • Record of accidents/incidents	Monthly monitoring.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
	Storage of construction materials	Under the subproject intervention the overall score is **low**.	• Orienting concerned person and team assigned for the construction work.	Construction Contractor and monitored by Consultant and PIU	• List of materials and sources of materials;	During implementation phase, as necessary with discussion with PIU, Consultant
3: Construction Phase	**Wastes**	Under the sub-project intervention the overall score is **low.**	• Prepare and implement on-site waste water runoff and labor camp waste management plan approved by PIU and consultants. • Wastes must be placed in the designated bins which must be regularly emptied. These shall remain within demarcated areas and shall be designed to prevent wastes from being blown out by wind. • All waste must be removed from the site and transported to a disposal site.	Construction Contractor and monitored by Consultant and PIU	• Complaints from community; • Regular inspection of waste management activity; • Waste disposal record.	As work weekly progresses
	Cut and fill Activities (Cutting of hill slope and earth removal from borrow areas caused for soil erosion and	Under the sub-project intervention, the overall score is low.	• During construction cut and fill will be balanced as far as is possible. Designs shall ensure that as far as possible all cut and fill activities are balanced • Proper care will be taken during cutting and filling so that slope or toe of the road embankment	Contractor, environmental specialist of D&SC	• Location of road alignment and slope.	Daily as work progresses

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
	landslides)		remain within the right of way and does not disturb the crop.			
	Storage of materials	Protected and safety storage to be needed for construction materials storage. Not interrupt natural land contours, disturbance in natural drainage patterns and logging of water and the overall score is **low.**	• With the assistance from site management committee in Camp to identify the storage site and other requirements, which will be approved by PIU and consultants.	Construction Contractor and monitored by Consultant and PIU	• List of materials and sources of materials; • Storage areas for materials and equipment.	Monthly basis during implementation phase, as necessary with discussion with PIU, Consultant
	Removal of Vegetation (May cause soil erosion and their deposition on nearby crop field, affecting soil quality and productivity)	Under the sub-project intervention, the overall score is **low.**	• If during detailed design cutting of trees is required, compensatory plantation for trees lost at a rate of 5 trees for every tree cut. • Prevent workers or any other person from removing and damaging any flora (plant/vegetation) and fauna.	Contractor, environmental specialist of D&SC	• Complaints from community;	Daily

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
	Noise pollution	Under the subproject intervention the overall score is **low.**	• Consultation with affected people; not to operate noisy equipment during working period; • No noisy work after 5.00 pm. • Sound suppression for equipment; • Ear protection for workers. • Conduct noise quality monitoring as per EMP.	Construction Contractor and monitored by Consultant and PIU	• Number of complaints from stakeholders; • Use of silencers in noise-producing equipment and sound barriers; • Noise Level following decibel meter (dB)	Inspection by PIU and supervision consultants on monthly basis;
	Air pollution	Under the subproject intervention the overall score is **low.**	• Water spraying for dust control; construction materials with potential for significant dust generation shall be covered; no smoke emitting equipment; and limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor and monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Records of air quality inspection.	Visual observation and monitoring of air quality during construction period.
	Road Safety and Accidents	Under the subproject intervention the overall score is **low.**	• Erection of suitable signage at construction sites • Direct observation and discussion with local people • Restrict the transport of oversize loads. • Operate construction vehicles to non-peak periods (night) to minimize the traffic disruption. • Enforce on-site and access road speed limits.	Construction Contractor, environmental specialist of D&Sc.	• Complaints from communities, pedestrians	Day basis during work time

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
			• The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc. • Local residents should be kept informed about planned Works			
4. Post Construction	**Road Safety**	Under the issue the overall score is **low**.	• Install traffic signs for speed limit, speed breaker where needed, Mile post and create adequate ***traffic*** detours, and sufficient ***signage*** & ***warning*** signs, Post speed limits and suitable bending on the road. • The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc.	Construction Contractor, environmental specialist of D&Sc	• Road signage and safety instruments at suitable locations and chainage	Immediately after the construction work is over.
	Tree re plantation	Under the issue the overall score is **low**.	• Replantation of trees during monsoon period • Maintain of trees properly • Check survival of trees and replant the dead trees	Construction Contractor, environmental specialist of D&Sc	• Number of complaints from stakeholders; • Records of trees number and tree plantation inspection;	Immediately after the construction work is over.
5.	**Maintenance**	Under the issue	• No advertisement/boardings shall	LGED	• Number of	During Operation

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
Operational Phase	**of road and assets** (Road accidents may increase due to higher number of vehicles using the roads at increased speeds)	the overall score is **low**.	be allowed within the Right of Way limits of the project road. • Regular maintenance and cleaning of assets such as sign boards, road safety sign etc. shall be undertaken. • Clear smooth speed breaker/rough surfaces should be clear in views. • Regular maintenance of road surface and shoulders.		complaints from stakeholders;	under LGED's regular maintenance program in each 3 years.

* Overall Impact Score: High = Likely to cause long-term E&S impacts; Medium = Likely to cause temporary impacts; Low = Likely to cause little, short-term impacts

**Post-construction phase denotes the time period contractor use to clear and clean up the sites after the construction work is ended, perform tree plantation, grass turfing, and minor rectification till the official handing over the site to LGED, or owner of the site.

Recommendation for further environmental and social assessment and/or site specific environmental and social management plan: Yes

**If yes, please specify what assessments/plans would be required.* Mention some recommendation on E&S assessment …. ESMP

If site specific environmental and social management plan (ESMP) is followed the impacts can be mitigated and monitored. ESMP is attached.

Appendix-2: Environmental and Social Management Plan (ESMP)

ESMP for Access and evacuation Roads; *(LGED/EMCRP-W23.6):* North Sonaichari-West Sonaichari Road Id:422945018

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
Pre-Construction Stage	Loss of land / and other physical assets	• No land acquisition is allowed within this sub-project activities So, there are no any mitigation measures according to this impact.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of livelihood	• Under this subproject, there is no scope of negative impact of adjacent livelihoods	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Stakeholders Engagement	• All of the project stakeholders should be consulted • Separate community level consultation meeting with the potential affected HHs • Consultation meeting with host communities about the project objectives and scope of works	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of right to access	• Project to ensure thorough analysis of alternatives that access enjoyed by the community remains intact. • In case of unavoidable circumstances, alternative access will be provided.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Site Selection & implementing interventions: Human-elephant conflict	• Selection of sub-project sites and all implementing interventions must take place outside of the elephant corridor/influence area.	PIU	Environmental Consultant of PIU, PSC
Pre-Construction Stage	Site Preparation: Soil Erosion; Alteration of natural drainage	• Our selected sites avoided the low land near the water bodies or natural flow path to avoid the flash flood or any kind or surface runoff.	PIU & Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Tubewell location within the construction site is not near to any kinds of latrine and soaks well which could be contaminated by those. • After completing the development we restored the place as like before to avoid the cut and fill operational problems. • This site is in the local community, so we discussed with the local community to avoid any conflicts related local habitation, culture. • Sub project intervention mustavoid of natural disturbance of existing slop and natural drainage. • The contractor ensuring sound environment for the local residents near the sub project site.		
Construction Activity	Noise from construction works	• Construction activities mostly will finish at day time within 05 PM, and must confirm proper measures for avoiding any disturbance. • All Personal Protective Equipments (PPEs) must be ensured in sites before starting any kinds of construction works.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Dust	• Acceptable range of emission of CO, particulate matter [SPM (**Suspended particulate matter)**, PM2.5, 10] and Hydrocarbons must be maintained through good construction work practices • Dust generation must be limited as a result of clearing, leveling and site grading operations with	Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		using water florescent manually and through water pipes. • Dust generation due to vehicle movement on connecting road shall be controlled by watering the path at limited level		
Construction Activity	Safety Issues	• Unauthorized entry is completely prohibited in our site and take necessary measures for preventing this problem • Before works started Contractor must provide proper training and guidelines on health and safety issues to the labors and associated staffs. • Records of every training must be kept at site. • All kinds of Child labour are completely prohibited in every site. • Every construction materials storage site will be well fenced by Tin and safety caution tape.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Traffic Management	• Contractors will maintain proper route for traffic management which is to beconsulted with and confirmed by the Executive Engineer of Cox's Bazar.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Conflicts with existing users due to the scarcity of resource base.	• A detailed assessment of the available resources and consent of the local representative for withdrawal of water from existing surface water sources shall be taken. • If ground water is withdrawn, adequate approvals from the appropriate department need to be undertaken before setting up bore wells.	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Any type of consent letter or agreement for withdrawing water from either surface or underground sources will be kept on site. • Local community must be consulted before any construction works starts.		
Construction Activity	Increase in road accidents	• Maintain safety measures during the movement of heavy machinery and equipment. • Local community will be trained up on traffic management and awareness.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Labour Base Camp: Conflicts with the local residents	• Awareness building session will be undertaken about prevention of child abuse, child marriage, GBV, sexual harassment, trafficking of women and children as well as illegal drug trade. Written records of this awareness building session shall be kept on site. • Work force should be prohibited from disturbing the flora, fauna including hunting of animals, wildlife hunting, poaching and tree felling. • Adequate facilities ensuring sanitation for labour camps will be put in place • Treated water will be made available at site for drinking purpose. • Adequate accommodation arrangements for labour forces. • Labor code of conduct is to be disclosed through consultation.	Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Construction Activity	Waste Management: Improper	Preparation of a waste management plan covering the	Contractor	Environmental

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
	management and handling of hazardous and non-hazardous waste during construction.	following aspects: • Residual waste from the temporary accommodation facilities for labor Waste and from equipment maintenance/vehicles on-site • After completion of construction works. So, recycling process is not applicable. • Proper consents for hazardous waste management.		Consultant of PIU, PSC
Construction Activity	Health & Safety Risks: • The potential for exposure to safety events such as tripping, working at height activities, fire from hot works, smoking, failure in electrical installation, mobile plant and vehicles, and electrical shocks. • Exposure to health events during construction activities such as manual handling and musculoskeletal disorders, hand-arm vibration, temporary or permanent hearing loss, heat stress, and dermatitis.	• All construction equipment will be properly inspected timely. • The risk assessment will be prepared and communicated prior to the commencement of work for all types of work activities on site. • Preparation of proper walkways and clearly designation as a walkway has to be ensured; all walkways shall be provided with good conditions underfoot; signposted and with adequate lighting. • Proper Signpost at any slippery areas will be ensured in construction site. • Fire extinguishers will be located at identified fire points around the site. The extinguishers must be appropriate to the nature of the potential fire. • This sub project has Proper communicative emergency response plan (ERP) with all parties, the ERP to consider such things as specific foreseeable emergency situations, organizational roles and authorities' responsibilities and expertise, emergency	PIU & Contractor	Environmental Consultant as well as Social Development and Gender Specialists of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		response and evacuation procedure and personnel will be trained and drilled to test and ensure the coherence with the plan. • All people of construction site will be concerned about the safety and maintenance of Electrical equipment; works will be carried out on live systems. • Provision to first aid box in sub-project areas will be ensured. • Proper Emergency evacuation response plan will exist in sub-project area. • All safety equipment will be available in sub-project site (safety, size, power, efficiency, ergonomics, cost, user acceptability etc.), the lowest vibration tools will be provided that are suitable and can do the works. • Awareness training will be given to all personnel involved during the construction phase in order to highlight the heat related illnesses of working in hot conditions such as heat cramps, heat exhaustion, heat stroke, and dehydration. Written records of this awareness training shall be kept on site. • Adequate quantities of drinking water will be available at all Sites, on different locations within the site. • Provision to maintain proper PPE wherever necessary and to ensure that there are satisfactory washing and changing facilities.		

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Provision to ensure all workers exposed to a risk are aware of the possible dangers and also given thorough training on how to protect themselves and there should be effective supervision to ensure that the correct methods are being used.		
Operation &Maintenance	Noise disturbances to fauna	• Provision to maintain noise and vibration from the operation and maintenance of machinery and equipment by proper monitoring and measures. • Provision to take necessary lighting, caution for the works and necessary maintenance should be done in day light.	PIU	Environmental Consultant of PIU, PSC. Union Member
Construction activity	Odours and pollution caused by leaking latrines and faecal sludge, and solid wastes impacting surrounding water bodies, flora and fauna	• Preventative maintenance schedule should be followed. • Solid organic wastes should be stored in bins and/ or skips and emptied regularly at a designated waste disposal area away from the camp site. If no designated site is available within the reach, a dug-hole at a nearby place can be used with periodic filling with soil layer for preventing pollution and generating nutrient rich compost soil over time.	PIU	Environmental Consultant of PIU, PSC. Union Member
Decommissioning during the project implementation period (including site clearance after the construction)	The impacts are similar to those listed in construction stage: • Pollution from waste materials • Health & Safety risks to workers and local community	• Contractor must prepare a demolition and waste management plan including following directive aspects given hereunder.	PIU / Contractor	Environmental Consultant of PIU, and Executive Engineer of Cox's Bazar

Waste Management Plan:

The Contractor shall develop a waste management plan for various specific waste streams (e.g., reusable waste, flammable waste, construction debris, food and organic waste etc.) prior to commencing of construction and submit to LGED for approval. The plans must include following principles or series of actions, which will be carried out/followed by the contractor and supervised by the Field level Environmental Specialist and Social Development Specialist.

For wastes:

- The quantity of waste materials shall be minimized by 3R (Reduce, Recycle and Reuse) approach, and wastes shall be segregated accordingly, wherever practical; and stored in designated places/facilities in the site.
- Construction site shall be maintained in a cleaner, tidy and safe condition and appropriate facilities shall be provided and maintained as temporary storage of all wastes before transportation and final disposal.
- Hazardous waste viz. waste oil etc. will be collected and stored in a paved and bounded area and subsequently sold to authorized recyclers.
- The scrap material generated from related construction activities will be collected and stored separately in the stack yard and sold to local recyclers.
- All wastes generated during construction shall be disposed off in an environmentally acceptable manner. This will include consideration of the nature and location of disposal site, so as to cause less environmental impact.
- Other leftover non-hazardous wastes, including construction debris shall be transported to an approved disposal site by pick up tracks or back loaded vehicles with proper care.
- Organic wastes produced in the camp site during the construction period shall be collected and transported in vehicles covered with tarps or nets to prevent spilling waste along the route to the designated disposal site;
- Burning of any type of wastes in the construction site shall be prohibited completely.

Prepared by: Harogopal Kabiraj, Environmental Focal Person, +8801714980171

Tanvir Ahsan Haque, Environmental Specialist, +8801688117059

Ms. Sadia Azad, Disaster and Climate Change Specialist, PIU.

Reviewed by: Md. Saiful Islam, Field Level Environmental Specialist, +8801913442006

Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.6

In consideration to the above-mentioned environmental impacts and their mitigation measures for this sub-projects, individual BOQ for each component has been prepared. Following tables will illustrate such items of enhancement and impact mitigation works as well as considering the emerged situation of COVID-19, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites.

Cost of Environmental Enhancement Works for W23-6 in BOQ

Sl no.	Description of item	Quantity	Unit price	Total amount
1.	**Grass Turfing** Turfing on embankment top and slope & any critical place with good quality turf supplied by the contractor of not less than 225mm square in dimension including placing and watering till grass is fully grown, etc. all complete as per direction of E.I.C. (Payment to be made only when grass is fully grown)	2059.0 Sq.m	@38.15 Tk. Per sqm	78,550.85
2.	**Dust suppression measures** Dust suppression measures like water sprinkling on aggregates/unpaved roads, in and around the work site and as per direction of E-I-C	945.0m	@ 2.56 BDT	2,419.20
3.	**Water Supply and Sanitation** Providing and maintaining adequate portable water supply, sanitation, cleanliness facilities at camp site and work site to the entire satisfaction of Engineer-in-charge. Temporary Toilet: Construction of temporary toilets in work site/ rest area complete as per design and specifications and approved by the Engineer-in-Charge. There should be 1 camp	2 nos.	@12822.86 per toilet	25,645.72

Sl no.	Description of item	Quantity	Unit price	Total amount
	in each site. In each camp, there should be 1 no of toilet for women and 1 no of toilet for men.			
4.	**First Aid Box** Supplying, equipping and maintaining adequate first-aid box throughout the working period at worksite and site office, and erect conspicuous notice boards directing where these are situated and providing all requisite emergency medical first aid kits, including complying with the government medical or labour requirements at all times, and provide, equip and maintain necessary dressing kits throughout the working period for attending minor injuries, etc. all complete as per requirement and full satisfaction of Engineer-in-charge.	1 no.	LS @5000 Tk. Per box	5,000
5.	**Drinking Water Facilities** Providing continuous adequate drinking water supply at worksite and site office as well by installing necessary tube-well/s where applicable or any other means depending on local situation, also providing essential arrangement for storing drinking water by supplying portable best quality water tank equivalent to Gazi/Padma of adequate capacity depending on the number of users, including supplying 1 (one) no. best quality water filter of minimum capacity 30 liters with necessary kits, etc. all complete as per satisfaction and direction of the Engineer-in-charge.	2 nos.	LS @ Tk. 30,000	60,000
6.	**Traffic Management** Maintaining traffic management at worksite from time of commencement of contractor's activities to time of completion activities, including ensuring that the road is safe for users, providing a safe working area for those involved in work on trafficked network and minimizing any disruption to smooth flow of traffic (this includes providing necessary barricades, warning signs/lights, guide signs, flagmen, maintaining diversion roads by cutting, filling, constructing, etc. or by any other means) in accordance with the full satisfaction of the Engineering-in-charge.	1 no.	LS @ Tk. 15,000	15,000

Sl no.	Description of item	Quantity	Unit price	Total amount
7.	**Personal Protection Equipment for Workers** Providing and maintaining appropriate (safe design, fit and comfort) personal protection equipment (PPE) to ensure the highest possible protection for employees in establishing and maintaining a safe and healthful working environment at workplace, including demonstrating, providing training on proper understanding and development of skill in the use of PPE, including supplying (i) best quality safety jacket, (ii) suitable hand protection gloves, (iii) appropriate foot protection shoes, (iv) best quality safety helmets, face shields, ear muffs etc. (v) suitable eye protection goggles	LS	LS @ Tk 30,000	30,000
8.	**Tree plantation** Tree plantation to compensate the felled down trees and enhance the ecological condition in the subproject area- preferably local fruits, flowers, medicinal and ornamental trees- Mango, Jackfruit, Jam, Kathbadam, Chalta, Krisnachura, Bokul, Jarul, Polash, Kadom, Shimul, Neem, Arjun, Amloki, Horitoki, Bohera, Mahogany, Palm Tree, Chambal, Rain Tree, Shil koroi, Satim, Sishu (including protection, fencing and conservation during project defect liability period): Preferably at both sides of Road where space is available (fencing as per LGED rate schedule 5.26.14) (Contractors will also be instructed by the consultant and PIU prior to the tree plantation work) at an interval of 10 feet.	80 nos.	@ Tk. 1000	80,000
9.	**Motivation training** Motivation training (twice: before and after construction start) of the Upazila Engineer 'sand Contractor's representatives on safety practice and as per direction of the E.I.C.	1 no.	LS @ Tk. 10,000	10,000
10.	**Waste disposal facility** Temporary camp site waste disposal facility improvement 2 nos. (1 no of organic waste and 1 no of inorganic waste disposal facility) and as per direction of E.I.C.	LS	@ Tk. 5000	5,000

Sl no.	Description of item	Quantity	Unit price	Total amount
11.	**Water Test (Drinking Water samples)** Water samples are to be collected periodically (half yearly) from the tube well at labor shed area for laboratory analysis of different parameters such as pH, arsenic, iron, chloride, hardness, total dissolved solids, nitrate, nitrite, coliform, electrical conductivity etc. all complete as per direction of E.I.C. (including the cost of actual fees for testing from reputed laboratory and report) as desired by E.I.C.	LS	@ Tk. 5000	5,000
12.	**Working labour shed:** Construction of Labor shed (Size: 30'x20') with C.I sheet Roofing, Tarza fencing and brick soling floor as per requirement and direction of the E-I-C.	1 no.	LS @ Tk. 30,000	30,000
13.	**Environmental management** Environmental management costs of the Environment & Social/ Safeguard Personnel for Environmental and Social Management and Monitoring during construction and operation phase for their salary & transport (Net payment excluding Tax &VAT). And as per direction of the E.I.C. **(One Safeguard Personnel for R6, R8, R9, R12 & R15)**	1 person	Monthly basis @Tk. 35,000.00 for 12 months. One person covering 5 roads i.e.35,000Tk.*12months*(1/5 one road).	84,000.00
	Subtotal Bill: Environmental facilities			**430,615.77**

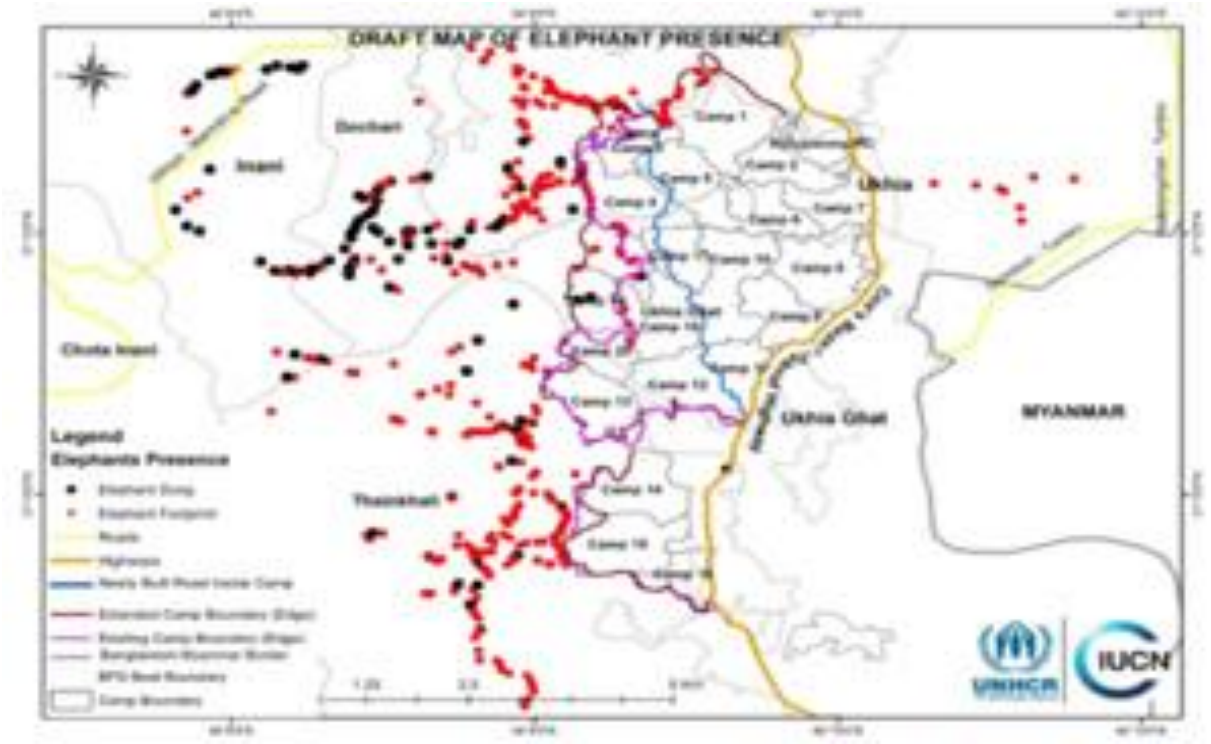
Cost of H&S Measures under COVID 19 Situations for W23-6

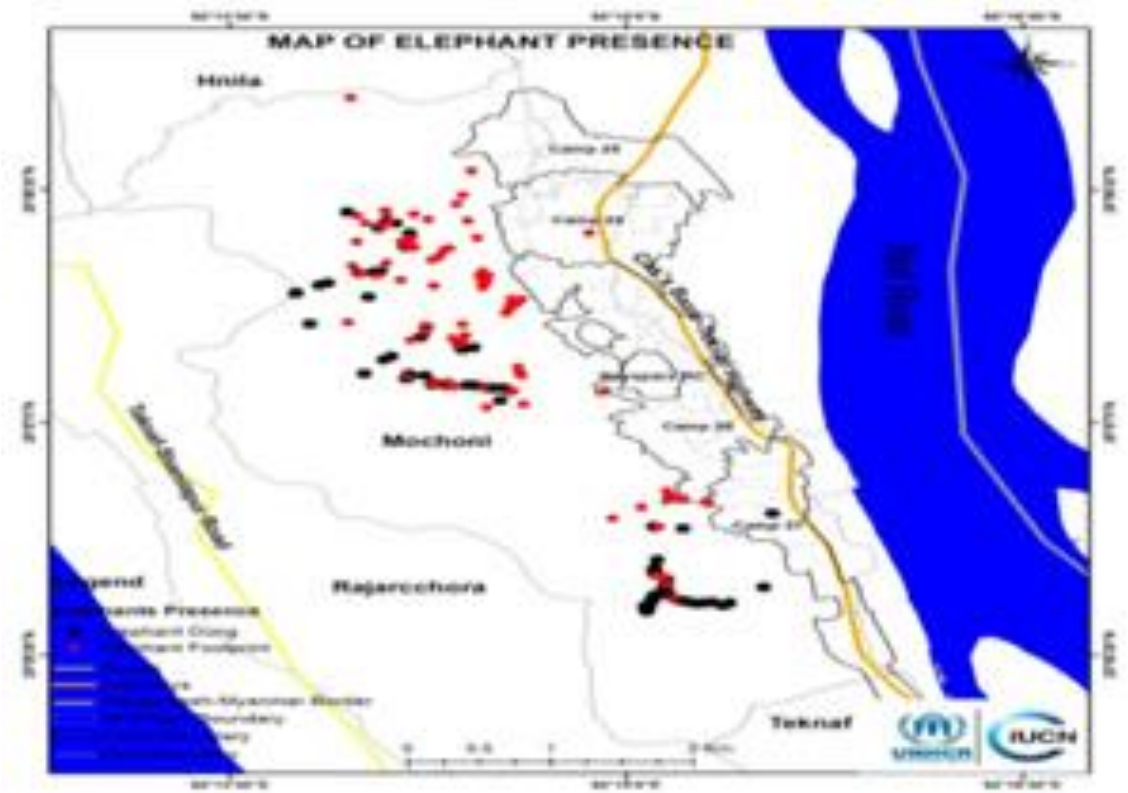
Considering the emerged situation, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites. The cost is estimated counting 19 workers for 270 active working days (9 months in a year) in a contract period for one site under this package (EMCRP/W-23.6).

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
1.	Non-Contact IR Digital Thermometer	01 nos. in each site	N/A	N/A	5,000.00	1	5,000.00	Each site office will have a thermometer for checking body temperature every morning at the entrance of the working site
2.	Wash Basin with Small Water Tank, Bucket and Mug (or piped water supply)	01 nos. in each site	N/A	01 nos. in each camp	10,000.00	2	20,000.00	Wash basin to be installed at favorable locations immediately after the entrance to the facility
3.	Trash bin (covered)/Paddle Bin	01 nos. in each site	N/A	01 nos. in each camp	550.00	2	1,100.00	
4.	Bar Soaps (150 gm each)	51		64	50.00	115	5,750.00	To be placed in a case/holder on the basin, for washing hands for max. 22 people a day and showering of 19 workers in each labor camp.
5.	Hand Sanitizer (2 nos. 250 ml bottle and 5 liter Can for Refill)	2 bottles and 1 Can for each site	N/A	N/A	4,000.00	1	4,000.00	2 bottles and a 5 litre can for each Site office
6.	Face Shield/ Protective Safety	10 nos. for each site		N/A	400.00	10	4,000.00	For labors who work in close contact, 10 in each site

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
	Goggles							
7.	One time Mask (Disposable) for Contractors' Staffs	3 nos. each day in each site		N/A	12.00	810	9,720.00	Reusing N95/KN95 mask will not be a manageable option in field scenario, one time disposable medical/surgery mask a good option instead.
8.	Cloth mask for Workers	N/A	19 nos. for each labor camp		35.00	342	11,970.00	A worker will use a mask for 15 days with everyday washing
9.	Floor Cleaner (1 litre Can)	1.5 Can	N/A	2 Can	250.00	3.5	875.00	
10.	Detergent Cleaner	N/A	1 kg in each camp/month		400.00	9	3,600.00	To be used for washing clothes, masks and tools & equipment, etc.
11.	Miscellaneous cost				20,000.00	1	20,000.00	Contingency cost for medical emergency and compensation for workers, subject to proper documentation
	Grand Total						**86,015.00**	

Appendix-4: Elephant Migration Routes Map





Elephant presence map (latest information published by on 24 May 2018)

Appendix-5: Location Map of Sub-project component

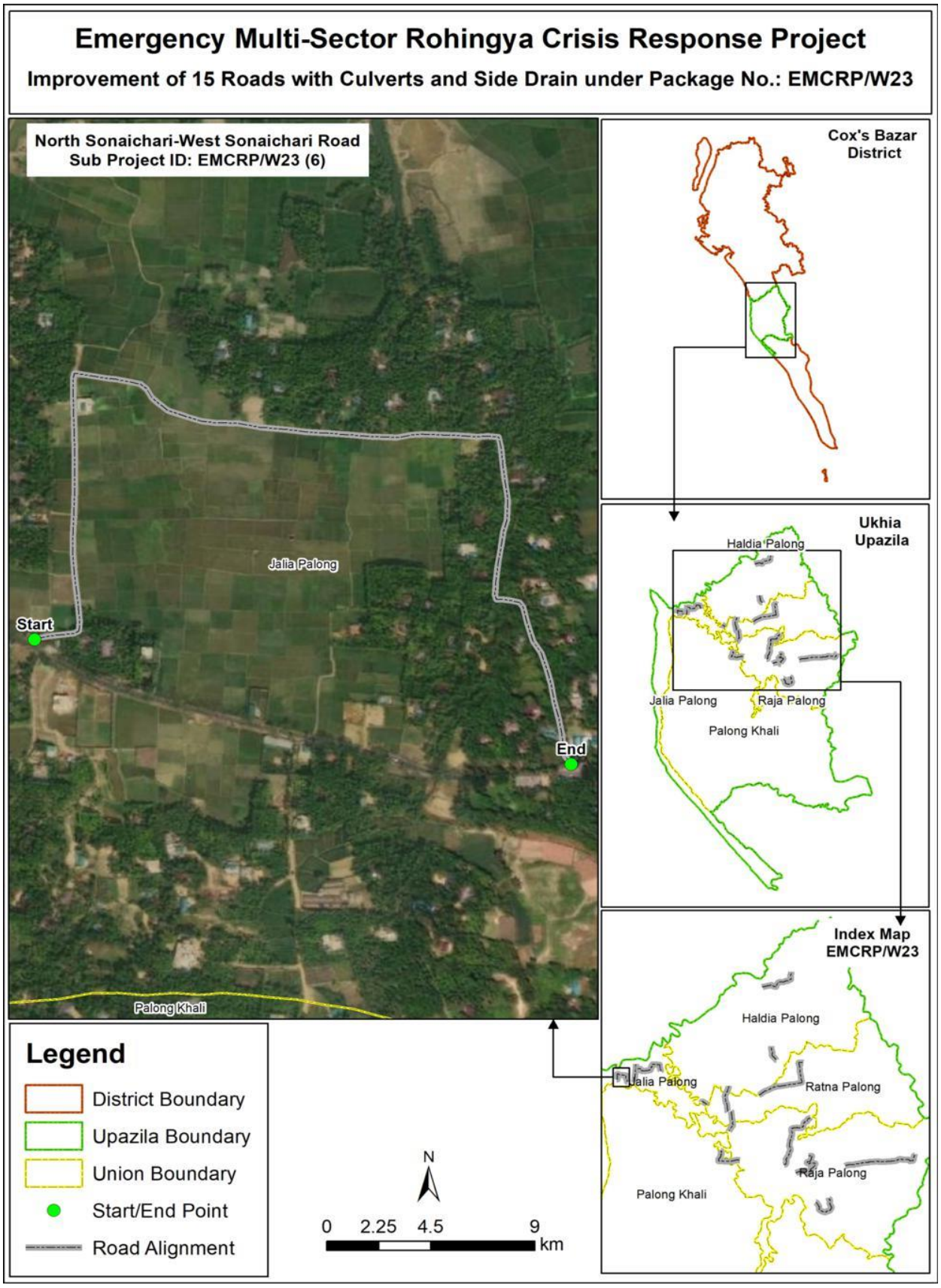
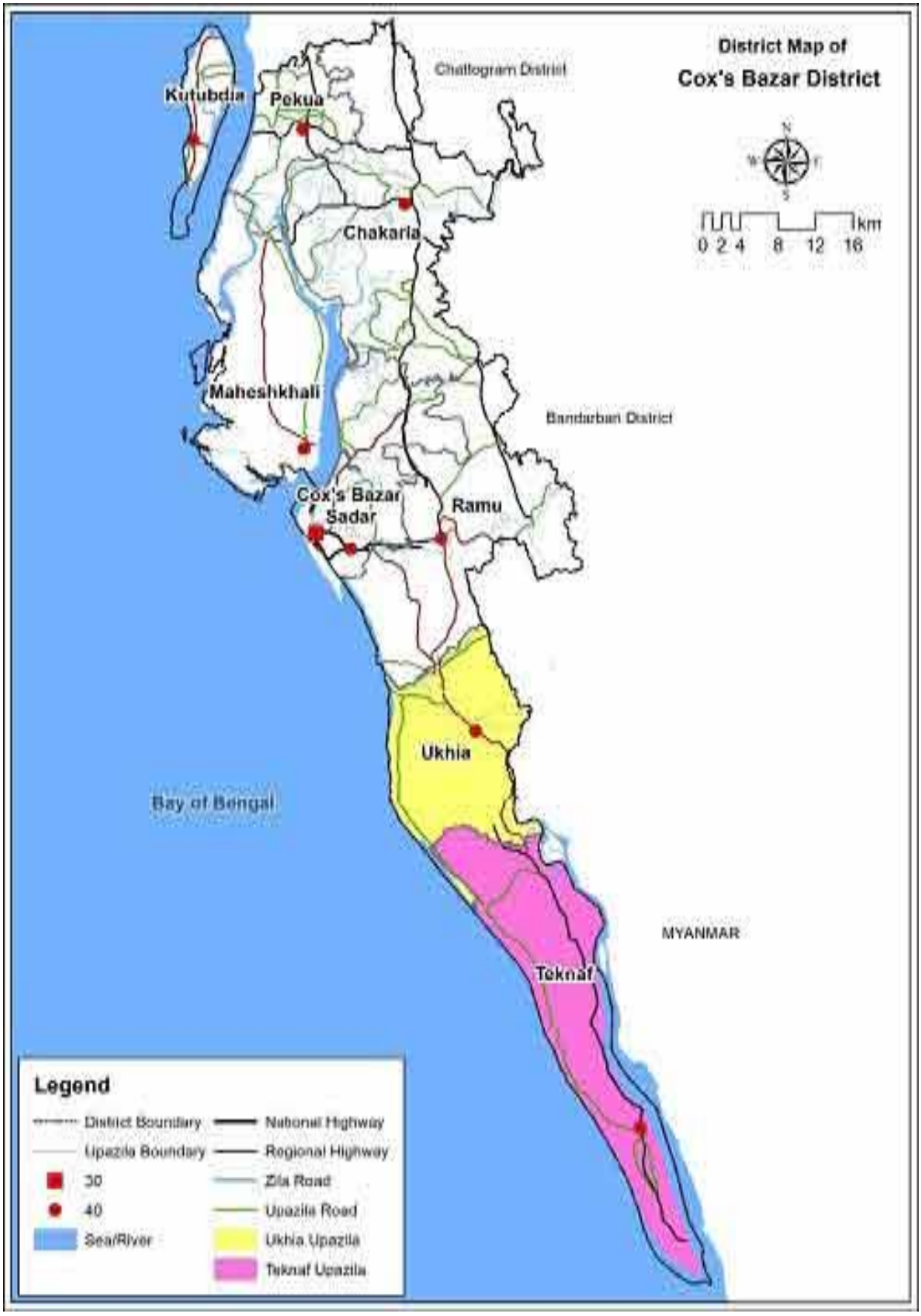
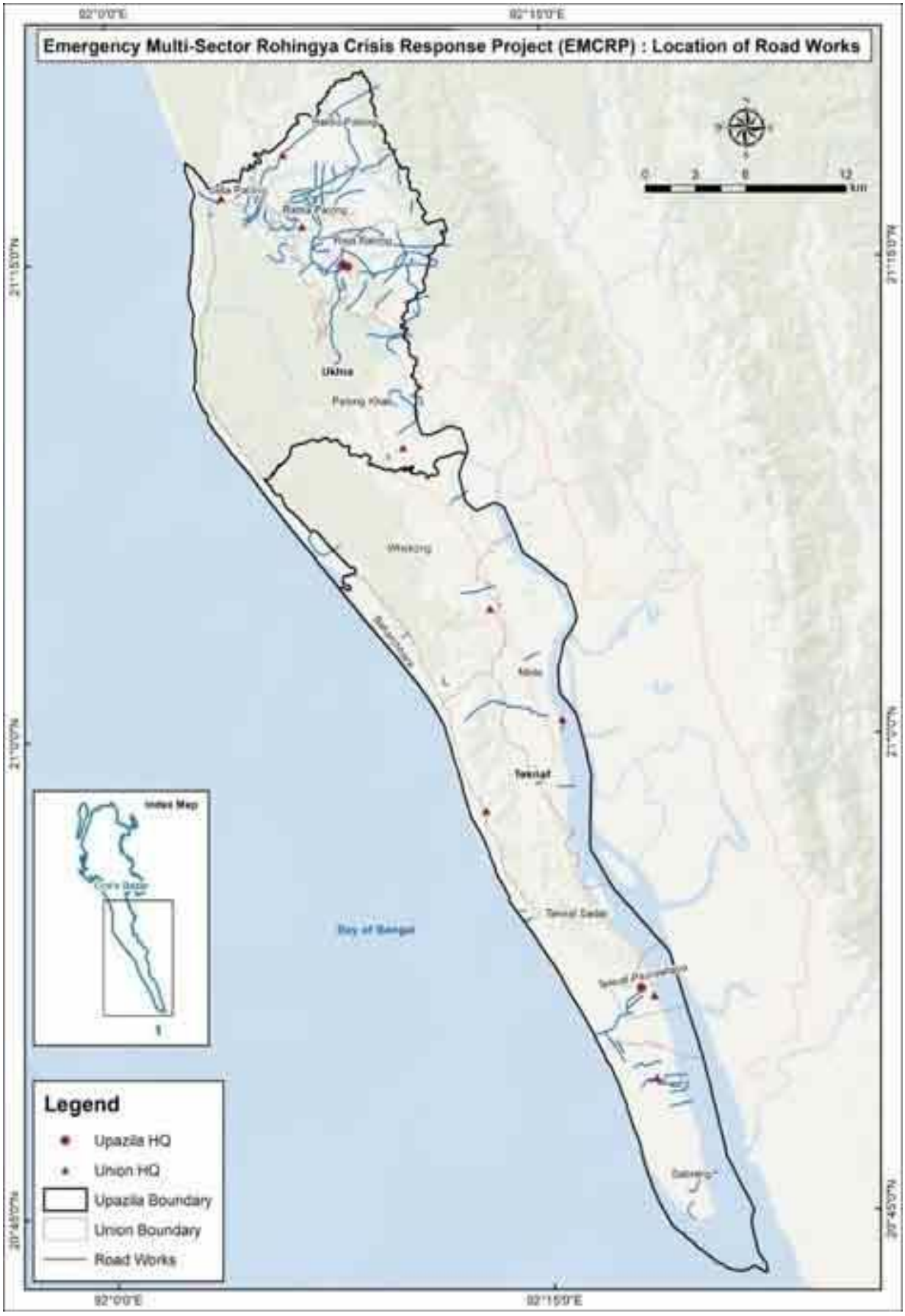


Figure: Location Map of W23-6



District map showing Ukhiya and Teknaf Upazila



Upazila map locating proposed roads

GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH
Ministry of Local Government, Rural Development and Co-operatives
Local Government Division
Local Government Engineering Department

Emergency Multi Sector Rohingya Crisis Response Project (EMCRP)

Project ID: P167762 **IDA Credit No. 5561-BD**





Environmental Screening Report

For Lambari para jame-E-Mosque Road with culverts and side drain under Cox's Bazar District.

Under the package no. EMCRP/W23

Funded by:

THE WORLD BANK
IBRD • IDA

Government of the People's Republic of Bangladesh & World Bank

Design and Supervision Consultancy:

Development Design Consultants Ltd.

October-2020

Contents

1. INTRODUCTION 1
1.1 Project background 1
1.2 Elementary information of Work Package Components of W23.7 2
1.3 Proposed intervention items of sub-projects for W23.7 5
2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS 5
2.1 Methodology 5
2.2 Important features/establishments within the PIA 6
3. ENVIRONMENTAL SCREENING 10
3.1 General 10
3.2 Major Findings 10
3.3 Climate Change Impact Screening 13
3.3.1 General Overview of the area 13
3.3.2 Site Specific Screening and outcome 14
4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) 15
4.1 General 15
4.2 Health and Safety Measure under COVID Situation 18
4.3 Cost of Environmental Enhancement Works in BOQ 19
5. LIMITATION OF THIS STUDY 19
6. CONCLUSION AND RECOMMENDATIONS 19
Annexure-01: Important Environmental Features (IEFs) near site: 21
Annexure-02: Attendance of consultation meeting 22
Annexure-03: Pictures of sub-project component location and surrounding features with public consultation 24
Appendix-1: Environmental Screening Form for examining sub-project component 25
Appendix-2: Environmental and Social Management Plan (ESMP) 43
Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for this sub-project component under work package EMCRP/W23.7 51
Appendix-4: Elephant Migration Routes Map 57
Appendix-5: Location Map of this Sub-project component 58

ACRONYMS

BOQ	Bill of Quantities
BFS	Brick Flat Soiling
D&SC	Design and Supervision Consultant
DoE	Department of Environment
DRP	Displaced Rohingya people
EA	Environmental Assessment
EC	Electrical Conductivity
EMCRP	Emergency Multi-Sector Rohingya Crisis Response Project
ESMP	Environmental and Social Management Plan
ERP	Emergency Response Plan
ESMF	Environmental and Social Management Framework
FDMN	Forcibly Displaced Myanmar National
FGD	Focus Group Discussion
FSM	Faecal Sludge Management
GBV	Gender Based violence
GPS	Government Primary School
GRM	Grievance Redress Mechanism
HBB	Herring Bone Bond
IEFs	Important Environmental Features
ISCG	Inter Sector Coordination Group
IUCN	International Union for Conservation of Nature
IWM	Institute of Water Modeling
LGED	Local Government Engineering Department
PIA	Project Influence Area
PIU	Project Implementation Unit
PMU	Project Management Unit
PPE	Personal Protective Equipment
PSC	Project Steering Committee
SMC	School Management Committee
SPM	Suspended Particulate Matter
SWM	Solid Waste Management
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
UNHCR	The United Nations High Commissioner for Refugees
VAT	Value-Added Tax
WB	World Band

1. INTRODUCTION

1.1 Project background

An estimated 730,000[1] people of Rohingya community has fled to neighboring Cox's Bazar district of Bangladesh since August 25, 2017 to escape extreme violence in Rakhine State of Myanmar, which caused the total number of Forcibly Displaced Myanmar National (FDMN) in the district to be about 923,033[2]. This huge number of displaced population account for about one-third of the total population of Cox's bazar, a district which was already facing many development challenges and suffering from resource-constrained social service delivery system even before the crisis evolved and the mass exodus of FDMN has worsened the situation further. Almost all of these displaced people are hosted in Ukhiya and Teknaf Upazila of Cox's Bazar, in extremely congested settlements in areas having very minimal access to basic infrastructure and services and is prone to natural disasters. The Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP) has been designed in order to reduce the vulnerability of Forcibly Displaced Myanmar National (FDMN) along with people from the host communities in Teknaf and Ukhiya Upazila under Cox's Bazar District, to different disasters and improve the social service delivery system and disaster resilience to both the communities. This project will follow a sustainable development pathway that is resilient to disaster and climate change effects.

The objective of the Project is to provide greater protection for the FDMN and host communities through:

- Reducing the vulnerability to natural disasters
- Improving social service delivery system and providing better communication facility through physical interventions
- Improving water and sanitation facilities
- Reducing vulnerability to accidental fire
- Provisioning better educational facilities and
- Strengthening and scaling up of GBV prevention services to the FDMN

The project is jointly being implemented by Local Government Engineering Department (LGED), Department of Public Health Engineering (DPHE) and Ministry of Disaster Management and Relief (MoDMR) under their respective mandate and scope of works. Apart from the interventions in Addressing Gender and Social Inclusiveness and Preventing Gender Based Violence with the Support from UNFPA and building Communication and Awareness among all affected parties through an effective engagement of BCCP (Bangladesh Center for Communication Programs) in the areas, LGED is implementing a good number of infrastructural facilities, namely improvement of hat bazars, roads (both inside and outside of the camps), bridges, culverts, construction of School cum multi-purpose disaster shelters, Satellite Fire Stations, Relief Distribution Center, Community Service Center and many other different types of facilities. Given the project interventions, sensitivity of the areas and volume of people in or around the sites, the project is more likely to trigger certain Operational Policies and Bank Procedures, namely Environmental Assessment (OP/BP 4.01), Natural Habitat (OP/BP 4.04), Forest (OP/BP 4.36) and Physical Cultural Resources (OP /BP 4.11).

[1] ISCG: Situation Report Rohingya Refugee Crisis, (September 27, 2018)
[2] IOM Needs and Population Monitoring round 12 as of October 10, 2018

1.2 Elementary information of Work Package Components of W23.7

It is imperative to recognize proposed components under Work Package-W23.7 in Ukhiya Upazila in order to assess and verify its interventions according to stipulated screening requisites from WB. Acknowledging this matter, such details are accounted for as given below in Table 1.2.1 along with visual presentation (General Upazila Map) given in Figure 1.2.1. Aerial maps for each sub-project is given in Appendix -5.

Table 1.2.1: Basic Featured Information of components [Sources of data: Field survey, 2020: DDC & LGED]

COMPONENT'S NAME UNDER W-23.7	GPS COORDINATES	DISTANCE FROM UPAZILA HQ	UNION	WARD	LOCATIONS UNDER PROJECT INFLUENCE AREA	PRE-EXISTING CONDITION OF ROAD	PROPOSED ROAD TYPE	ROAD DIMENSION(M) (LENGTH X WIDTH) = FOOTPRINT (SQ.M) *
LAMBARI PARA JAME-E-MOSQUE ROAD ID:422945019	**Starting Point** 21.28876^0 N 92.08199^0 E **Ending Point** 21.28987^0 N 92.07249^0 E	5 km	Jaliapalong	2	Lomboripara (Uttorpara), Dighir beel (Uttorpara), North-East Shonaichori	Partly Broken BC and partly Broken HBB, Partly Earthen	Bituminous Carpeting (BC) with Culvert and Drains	(2340mX4.9m) = 11466 Sq.m

*Note: Roads are proposed to have average carriage way of 3.7m with 0.6m shoulder on each side; special conditions may prompt further adjustments while in construction period. However, footprint for roads are calculated with an average of 4.9 meters.

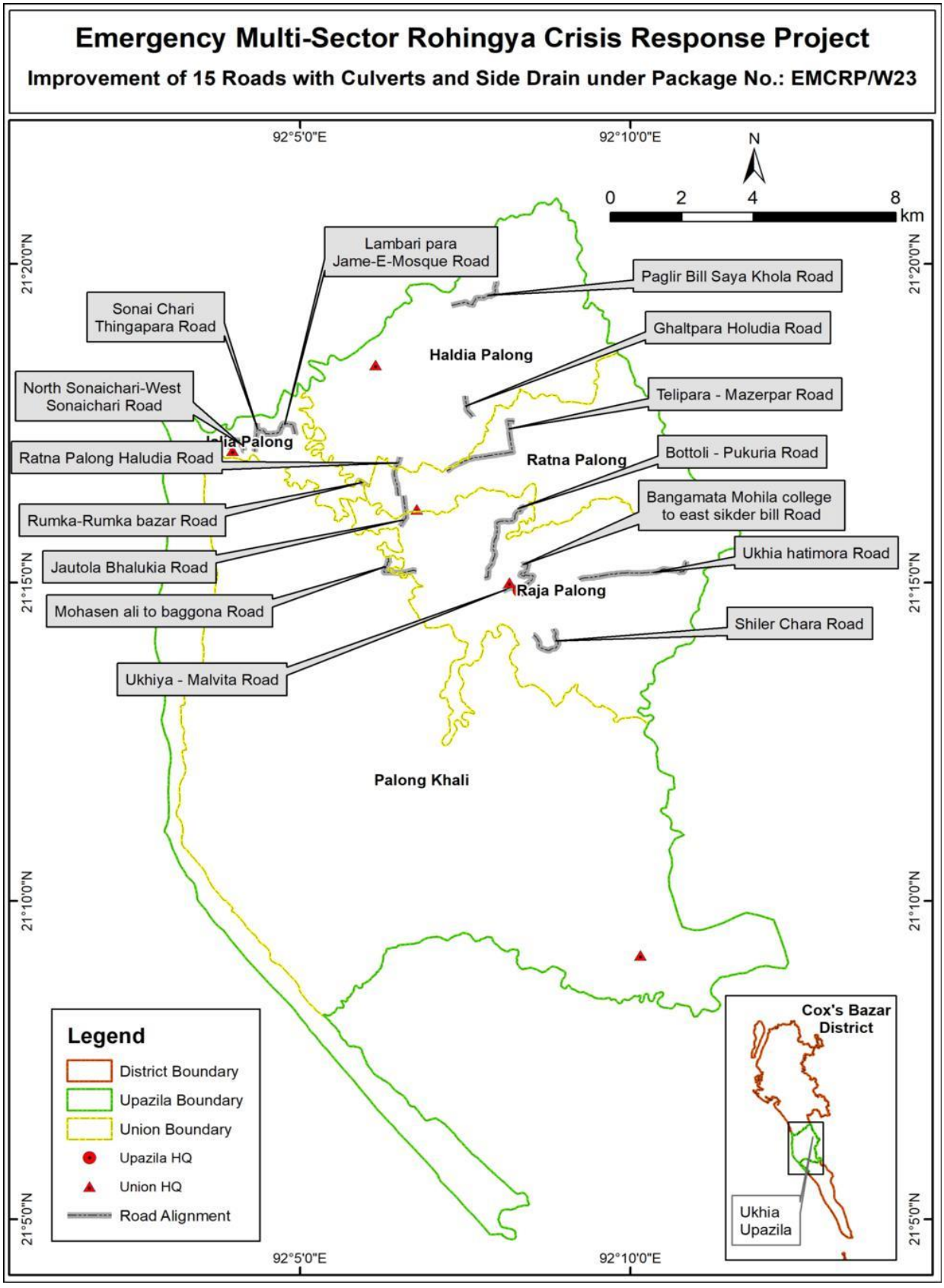


Figure 1.2.1: Map illustrating Roads of Work Package EMCRP/W23 locations in the Ukhiya Upazila

1.3 Proposed intervention items of sub-projects for W23.7

The roads under work package W23.7 have been proposed with specific need basis dimensions to accommodate and ensure best quality interventions for local stakeholders. In context of governing environmental circumstances and geo-meteorological conditions, protection work items have been added to construction design for safety and sustainability of each proposed roads. These roads are abutting agriculture hence, construction and improvement works will descent these roads into new circumstances in some parts. These items have been included on the basis of field survey and analysis of these conditions. Please follow the table to acknowledge these items.

Table 1.3.1: Proposed safety interventions of each sub-project

W23-7: Lambari para jame-E-Mosque Road Id:422945019
06 nos. Cross Drain (dimension: 0.975mX 0.975m) at Ch. 811m, Ch. 1267m, Ch. 1321m, Ch. 1752.0m, Ch.1846.0m, Ch. 2070.0m, and **01 nos. Box Culverts** (dimension: 2.0mX2.0m) at Ch. 1590, **374.0m Palisading wall** and **388.0m Toe wall, Road safety** work and **Environmental Mitigation and Enhancement** works are also included. Description of safety works and environmental enhancement works can be found in BOQ attached in Appendix-03.

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS

2.1 Methodology

Public participation and community consultation have been taken up as an integral part of environmental assessment process of the project. As part of the impact assessment, participatory public consultation was conducted in areas of concern for proposed road by the field level staffs and consultants from PIU and D&SC. The consultation meeting was attended by disparate social groups representing local habitants, separate age groups, social class and occupations. In some cases, IUCN employees in charge of elephant watch tower were present where frequent elephant movements occur. The participants were also selected from different segments of stakeholders, and some of whom will have major active roles before, during and even after the construction works. Therefore, the meeting was organized in an informed, expressive and unbiased manner, wherefrom different views and concerns came across which will be properly taken care of during the design and construction phases. In order to serve our screening process, relevant items were thrown towards the audience to discuss and troubleshoot confusing or worrying matters regarding the proposed intervention under package work. Impacts in regards to environment, socio-economic matters during pre-construction, construction and post construction phase has been put forth. Possible mitigation measures and relevant needs have turned out during these sessions as well. Moreover, their comprehension as a stakeholder has been up lifted in light of project guidelines.

However, public consultation is a living process as the types of problems/ difficulties, involved parties or stakeholders and mode of settlement or resolution processes are more likely to differ with time. Thus, consultation with different parties or stakeholders will be continued throughout the sub-project implementation period and records of resolutions, whatsoever and wherever possible, will

be kept in writing at the site and made available on any enquiries or requests by all parties concerned.

All components under the work package have been put through review for locating impediments or possible adversity effecting future environment and socio-economic conditions. In order to comprehend surrounding features and impacts which may stipulate with it, screening has acknowledged having a Project Influence Area (PIA) of 0.5-kilometer radius. Sensitive findings have been identified if any, and relevant mitigation or minimization measures were suggested to subdue such complication for over the project construciton period. Moreover, evaluation was inspired to enhance environmental features and include monitoring initiatives under ESMP budget to ensure exertion of environmental improvement propositions. Contractor's responsibility has been taken into account while identifying possible impacts through sets of intervention accounts. These steps have been initiated strictly following ESMF guidelines and requirements. Environmental screening procedure was motivated by ingredients highlighted in Appendix-2 of ESMF. During survey, detail chainage length of the sub-projects was taken into account for detailing environmental and socio-cultural features within 100 meters buffer zone of both Left and Right side from the center line of the road. Longitudinal intervals of 300 meters have helped to identify positions of sensitive or near-sensitive socio-cutural features. These findings are illustrated in **Annexure-01**.

2.2 Important features/establishments within the PIA

Initial screening process is conducted through direct involvement of PIU and D&SC in the influence area of the proposed component, which allows to raise significant questions and ideas towards participants. In combination of both field walk-through and inputs of audience, a register of existing features is formed. Allow the following table to describe such elements in all the work package components.

Table 2.2.1: Important features within Project Influence Area for W23.7

Component's name under W-23.7	Direction	Important features/ establishment (approx. distance from the proposed site)
Lambari para jame-E-Mosque Road Id:422945019	North	Old Graveyard (300m), Rejur khal(100m)
	South	Shoudagorpara Madrassa (20m), Baitul Karim Jame Mosque(300m),
	East	Households (30m)
	West	Lomboripara GPS (20m), Lomboripara Jame Mosque (50m), Lomboripara Hefzokhana (60m),

2.3 Issues and Recommendations raised by the Participants in regards to component interventions for W23.7

After inauguration has set in motion, their valuable opinions and remarks came pouring out. At this point, we find our field base knowledge for assessment attributed impact degrees and possibilities. Please follow the table 2.3.1 given below to recognize participants' inputs arranged in relevance with this component. Consultation meeting summary, attendance sheets and pictures of separate meetings with proposed location for this sub-project component can be found in Table 2.3.2 and Annexure-02 and Annexure-03 respectively.

Table 2.3.1: Issues and Recommendations raised by the Participants

COMPONENT'S NAME UNDER W-23.7	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
LAMBARI PARA JAME-E-MOSQUE ROAD ID:422945019	•They are very much concerned with absence of reliable path route in Lomboripara (Uttorpara), Dighir beel (Uttorpara), North-East Shonaichori area. This location is badly in need for a developed pathway. Most of the chainage went through marshy locations and muddy access points. Among 600m to 900m there is a khal called Borar khal. This runs along the proposed road on the right. •Lack of proper and strong road keeps motor vehicles from	•Local people considered that the selected site is suitable for the construction of this road from both the technical and social-environmental (direct savings in the cost of operating vehicles, time savings by travelers and freight, wider effects can less accident rates, road being waterproof and dust free, much more durable) point of view. It will provide better mobility and access to services in due time. •The road should consider water flow during rainy seasons thereby ensuring the construction is not affected by mass water flow. •Enough pathway is expected for vehicle movement so that comfort travel is achieved.

COMPONENT'S NAME UNDER W-23.7	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
	accessing these locations. •Possible dust and noise pollution during the construction works. •Safety of children and adults at the sites during construction works. •Elephant movement is not present in these areas. •Local community wish to have a better drainage system along with the road in order to allow waters from undulated terrains to find an uninterrupted pathway not causing harm to agriculture fields and wash away top soil of adjacent grounds residing alongside the road. It will protect the top soil for future growth of crops and aid vegetable farming. •The participants have expressed their greater interest for this intervention and believes this will bring nothing but prosperity for the entire catchment dwellers. •Household fences along the road should not be affected while construction • No trees should be harmed for preparation of this road • Available pathway to usher material delivering vehicles • Labor shed availability in the target location • Identification of material storage	•Construction site safety should be ensured to avoid any mishaps or accidents during work periods. •They considered small lumbering and suggested tree plantation initiatives. •They also requested to involve the local community to construction work and they will welcome any outside key labor. •During construction period, alternate route to pass through this area is available. •Since the road is passing alongside homestead gardens and agriculture fields, the intervention will invite air pollution on moderate level during construction period. However, preventive actions and measures can be taken to keep air quality from degrading. • Women should be recruited equally, wherever possible. •Participants, made certain that they will provide surveillance over raw materials and material storage area. •They have also ascertained that the selected site is free from any events related to resettlement and major environmental impacts. The adverse environmental impacts that may come in the way of air quality, noise, solid waste, occupational health & safety during the construction period, and will be of short duration, yet proper management/conservative options should be adopted. •Open space near sub-project side can be used as labor shed and material storage space. •A connecting road called Lomboripara road is available as connecting road for material delivery. •In 900m to 1200m chainage only marsh land is found, here no pre-existing earthen road of any sort is present which is highly dangerous for pedestrians to pass. Locals suggested to make the road higher in order to avoid inundation during monsoon season.

Table 2.3.2: Consultation Meetings Summary

Road Package Number	Date DD-MM-YYYY	Venue	Main Participant Groups	No. of Participants	Remarks (If any)
W23-7	06-10-2020	Bodiul Alam Store	Host Community	51	The local individuals, elites, chairman and/or member of respective Union Parishad, representatives from different agencies participated in those consultation events.

3. ENVIRONMENTAL SCREENING

3.1 General

This section identifies the potential impacts that the various elements of the proposed Project may have on the physical, biological and socio-economic environment within half a kilometer of the radial distance around the site. Environmental Assessment (EA) based on this screening study for the Sub-project has been conducted to identify and determine which potential Project impacts may be significant and therefore require the application of reasonable and effective management and/or mitigation measures.

In order to realize the exact physical, biological, socio-economic and environmental impacts of the proposed sub-project sites and the influence area in regards to the implementation measures, an extensive field visit was carried out in each proposed sub-project PIA. Environmental Screening form, as adopted in **Appendix 2** of the Environmental and Social Management Framework of EMCRP, was administered for identifying the impacts and their extents.

The screening data and information for this sub-project component and details screening summary have been formulated and shown in **Appendix-01.**

3.2 Major Findings

A complete view of current environmental conditions of individual sub-projects in relation to interested queries has been congregated in order to understand the degree of impacts corresponding with marked interventions. Interestingly, most sub-project has correspondence with its surrounding features and upholds interchangeable impacts. However, the degree is not an interchangeable factor since scale is not parallel to each of these components which is where, mitigation measure differentiation is implied. There are some cases where unique circumstances have been met with while environmental screening took place which is also accounted for and should be a matter of concern for other parts of the ESMF initiative. The significant issues observed for this sub-project component is enlisted in following Table 3.2.1 with pertaining impacts. Moreover, impacts that are adventitious has also been embraced for promoting best practices.

Table 3.2.1: Concerning environmental issues relating to each proposed subproject and influence area.

COMPONENT'S NAME UNDER W-23.7	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
LAMBARI PARA JAME-E-MOSQUE ROAD ID:422945019	It is not located within any major environmentally sensitive area.	It will not cause any severe negative effects to the environmental settings of the area neither to important environmental features.
	Construction period will induce air pollution while preparing for bitumen and loading-unloading raw materials. Impacts on air quality during the construction phase may turn to negative. The main impacts include dust generation from crushers, vehicles and the transportation of all types of construction materials.	It will invite waste production which may in turn cause minor air pollution due to deposited dust and airborne particles less than PM_{10}. Dust pollution may slightly suffocate photosynthesis however this can be minimized through regular water sprinkling as suggested in ESMP.
	Noise emission from construction machineries and equipment can cause nuisance to local residents and workers.	The ambient noise level might have potential to increase temporarily and intermittently in the close vicinity of active construction fronts.
	No agriculture, fish farming and significant vegetation coverage is located in the ROW nor does it stand over such items. Nonetheless agriculture fields and homestead gardens/forest are found beside the road.	No agriculture land or any forest coverage will get degraded or lost for construction. Liquid waste such as left-over oils or chemicals might run into these adjacent features.
	Construction works will involve chemical usage and preparation of on-site add-ons to the road. Generating scraps and residues.	The runoff from work site may enter existing pond and frustrate the water quality which will be acute however.
	Few amounts of bush (sapling) will be cut down during construction phase at different chainage.	No severe damage will occur or damage to habitat will be faced. It can be managed by introducing small plantation incentives around the proposed location.
	Elephant Movement is not present in the vicinity of the subproject location.	No impact is expected
	No heavy earth excavation work will be involved.	Consequently air, noise and dust pollution will be occurred within a small-scale during construction period only.
	Construction related activities and setting up of labor camps along with associated facilities and their management can cause adverse impacts.	Noise pollution from pilling or drilling, air pollution caused by dust or gaseous emissions from vehicle movement, running of motorized equipment and land clearing, odors and soil pollution from leaking of latrines and fecal sludge, will more likely to take place.

COMPONENT'S NAME UNDER W-23.7	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
	Chemical spills or improper disposal of construction waste materials due to lack of worker training and misconduct of contractor's safety initiatives.	During the construction period, soil may get contaminated from activities such as handling of hazardous construction materials (such as fuel, lubricants, paints, and solid waste and sewage).
	Vibration effects generated from pilling, drilling or other construction works	Any vibration would result in nuisance effects to nearby faunal species, and but will be localized and temporary and will unlikely to result in structural damages to buildings or walls of the adjacent private properties.
	Sensitive environmental, cultural, archaeological, religious sites within 1 kilometer of site includes including Old Graveyard (300m), Rejur khal(100m) to the North. Shoudagorpara Madrassa (20m), Baitul Karim Jame Mosque(300m) to the south. Households (30m) to the east and Lomboripara GPS (20m), Lomboripara Jame Mosque (50m), Lomboripara Hefzokhana (60m) to the west.	No disturbance to all these establishments/features is anticipated due to construction activities for the sufficient distance from the construction site, and strict construction site management system- including restrictive work schedule during the daytime only, water-sprinkling twice a day on and around the site, safe storage of materials, etc.

A few incidents of human elephant conflict have been reported in 2018. The IUCN has conducted a study on such conflict. With the support from UNHCR, IUCN has been marking elephant routs and corridors and informing local communities and stakeholders of avoiding the marked areas. As part of the mitigation options, different initiatives have been undertaken, such as formation and capacity development of Elephant Response Teams (ERTs); providing equipment to ERTs to divert in-coming elephants; and setting up elephant deterrent tools (e.g. trip alarms and watch-towers). Though the current chances of occurrence of conflicting incidence are zero, any recurrence would be managed by the ERTs and they will be called if there appears any minute possibility to recur. A map of elephant movement is given in Annexure 04.

In order to offset the loss or attenuating the environmental degradation, a set of mitigation measures will be adopted, on top of general practice of standard construction procedure or following the relevant codes of practices.

3.3 Climate Change Impact Screening

3.3.1 General Overview of the area

Cox's Bazar is one of the coastal districts of Bangladesh and is prone to the effects of climate change due to its geomorphological siting and climate induced effects. The hilly tracts of Cox's Bazar could foster further environmental crisis brought on by indiscriminate deforestation and diminishing groundwater reservoirs, which have been taken place in recent months as the Rohingya crisis evolved. A recent study conducted by World Bank[3] has found that Cox's Bazar will be the worst-hit district in South Asia as average temperatures rise and rainfall patterns become disruptive, by 2050, if greenhouse gas emissions continue unabated.

The hilly region of the country, especially the part in Cox's Bazar is characteristically of muddy soil structure, not of any rocky formation and the stability comes from the roots of the trees. Also rainfall, proximity to the sea, elevation, and land cover are very important factors for analyzing the risk of cyclone. Denudation of trees from hilltops in order for the huge settlement of Rohingya people has already increased the vulnerability to the risk of hill collapse by destabilizing the terrain. Also deforestation at a rapid speed uncovers the land and raise the risk of occurrence of cyclones, as forests protect land from high wind and storm surges where demolishing the trees would make the area vulnerable.

Together with the above-mentioned hazardous situation, again due to sudden extraction of huge amount of groundwater, availability of potable water from shallow tube wells that pump water up from about 150 feet has already reached to a critical level. Averting the problem requires new tube wells to be plumbing deeper into the poorly mapped aquifer, but going deeper than 700 feet in some places may cause salt water to contaminate freshwater resources.

In this case, it is possible that a stationary position of the freshwater-saltwater transition zone can be established via proper management of pumping in the confined aquifer.

The groundwater resource is seen to suffer more from the climate change impact. The impact on groundwater due to climate change impact include

- Sea-level rise could result in a transgression of the sea and a loss of land area. This could also lead to the secondary effect of population migration in the new coastal band due to migration of the coastal population from the encroaching sea, thereby increasing domestic water needs in the new coastal area.

- Transgression of the coast implies that saline storm surges of 1 or more meters depth would penetrate beyond the new coast to new land areas. Storm surges transport saline water far inland of the coast and much of this floodwater may infiltrate the ground in areas where the aquifer is not fully saturated. Even where the aquifer is saturated, denser saline water may

[3] https://openknowledge.worldbank.org/bitstream/handle/10986/28723/9781464811555.pdf

sink into the aquifer during the flood and later from pools of saltwater that remain following the flood[4].

- It has been identified that the salinity is found in the shallow aquifers along the coastline. So the salinity which are found in the groundwater are of lesser concern as salinity will subside over time

- Several researches show that through modeling of groundwater flow that the depletion of groundwater in the host community will persist up until 2022 and the replenishment of water will take place.

Considering the general climate change effects in Cox's Bazar area and offsetting the aggravating environmental situation due to the mass arrival of Rohingya communities, several specific measures including tree planation in sub-project areas, rainwater harvesting from every disaster shelter, construction of drainage facilities along the road length and installing thunder arrester across the areas, have been suggested and will be implemented.

3.3.2 Site Specific Screening and outcome

Climate Change impact on a particular subproject is tough to deduce as the highest resolution of climate model simulation done over Bangladesh is 50km. Depending on the simulation ensemble of Cox's Bazar district, the temperature and precipitation are likely to increase with time.

Site specific climate change impacts are often not so easy to measure or deduce plausibly while the site is confined to a narrow strip of roadways, and associated mitigation or offsetting measures are really hard to plot on the impact areas, though an overall set of measures are often considered in practical aspect. Fig:1 shows the inundation risk map of the subprojects under W-23, none of the subprojects are in vicinity of the severe river flood inundation area. So the risk of flooding is low around the sub-project area

[4] "Implications of Climate Change for Fresh Groundwater Resources in Coastal Aquifers in Bangladesh", World Bank report.2010

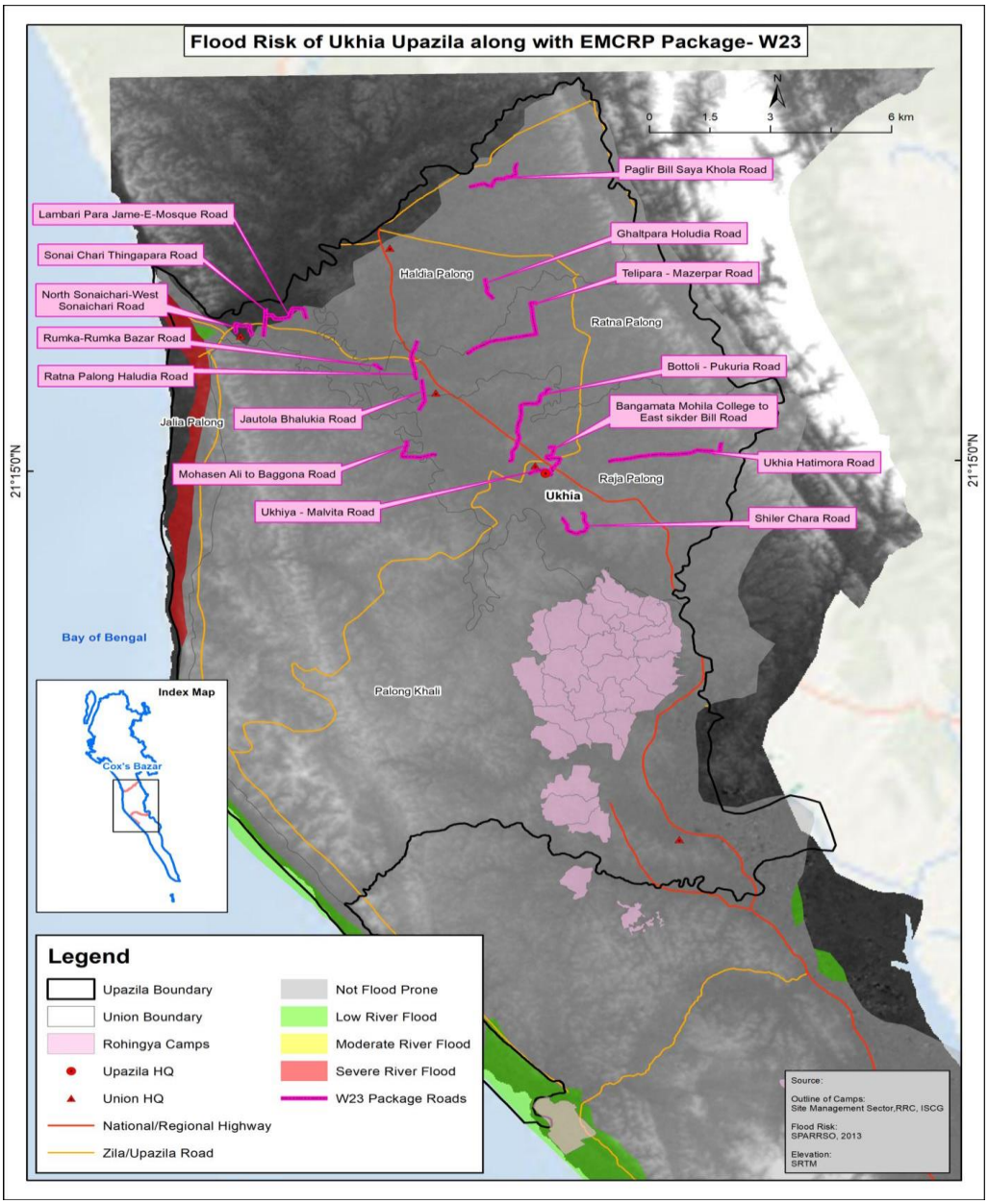


Figure 3.3.2.1: Flood inundation risk map near the subprojects.

Also, in order to avoid the devastation caused by the thunderstorm, state-of the-art thunder arrester (lightning protection system) has been suggested to install having a coverage area of 25,434 sq.m for a single arrester. In addition, tree planation on the road slope/ within the premises is also suggested to sooth the temperature effect and increase the water retaining capacity of soil, at the same time.

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

4.1 General

Considering the environmental settings of the sub-project area, it can be assumed that possible impacts would be largely construction-related, and could be addressed through adoption of good engineering practices; good housekeeping; better *in-situ* construction materials management; and observance of health and safety protocols during the implementation period.

Table 4.1.1: Site Specific Impact and Mitigation Plan under package W23

Component's name under W-23.7	Impacts	Mitigation plan
Lambari para jame-E-Mosque Road Id:422945019	To the south Shoudagorpara Madrassa (20m). To the west Lomboripara GPS (20m), Lomboripara Jame Mosque (50m). There are settlements as shops and households are located adjacent to the sub-project which can be subject to air pollution. However, none are on the ROW.	Contractor must adhere to the best practice debris management procedure and regular adoption of dust control measures (spraying of water at least twice a day) to minimize the effect to the level best.
	Some part of the proposed road is passing by the agricultural land. **Box culvert** and **cross drain** will be constructed to terminate rainwater for one side to another side during rainy season and also help for rapidly remove excess soil water to reduce or eliminate waterlogging during monsoon and return soils to their natural field capacity and will help to maintain the water balance of both roadside agricultural land to provide a sustainable irrigated agricultural system. It will also help to prevent flood and not to allow water to overflow and also help to divert water for farming. Some low land is found beside the proposed road so **protection wall** will be constructed during construction period for used to "correct" the natural slope. There are points on the road where slope preparation cannot be done due to having low lying agriculture lands and water bodies. Slope preparation refers to resettlement issues as well in those locations. In such cases **Toe Wall** is proposed which helps to restrain the horizontal surface pressure. This is an adaptation technique and a precaution measure to not allow any damage to sideline existing low-lying features. There are low lands along the road where agriculture fields and ponds are present. This also excludes high chance of soil quality degradation.	**06 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 811m, Ch. 1267m, Ch. 1321m, Ch. 1752.0m, Ch.1846.0m, Ch. 2070.0m, and **01 nos. Box Culverts** (dimension: 2.0mX2.0m) at Ch. 1590, **374.0m Palisading wall** and **388.0m Toe wall, Road safety** work and **Environmental Mitigation and Enhancement** works are also included.

Further construction related activities which may result in adverse impacts in the surrounding environment of the sub project must be kept under close consideration and appropriate mitigation and management measures will be taken with due care and vigilance. Once the effects are minimized to its least level and controlled efficiently, it will turn into a welcoming and beneficial project for the local communities. The subproject specific environmental management plans have been outlined in **Appendix-2**. The mitigation measures as well as monitoring program of ESMP have also been incorporated in the management plan.

Environmental quality enhancement: Under the additional financing to the EMCRP project, Forest Department of the Government of Bangladesh will afforest along 200 km of road length area, primarily under the Ukhiya and Teknaf Upazila of Cox's Bazar district in order to offset the environmental and ecological devastation, that had been occurred due to the evolution of Rohingya Crisis, to an achievable level. Many of these road lengths will go through and by the Rohingya Camps, up on the hill and are already denuded of trees or vegetation. Local Government Engineering Department (LGED) will allocate and channelize the finance to the Forest Department under the said additional financing component and oversee the progress of works with due diligence. However, this enhancement work will improve the environmental quality of the area and reinstate some parts of the ecosystem services to those areas, though primarily.

4.2 Health and Safety Measure under COVID Situation

Apart from the established Occupational Health and Safety (OHS) measures being followed in construction sites, offices, and labor camps, a set of additional measures has to be taken and practiced throughout the daily cycle by each labor, staff and any involved parties, due to the ongoing pandemic coronavirus situation. Staffs and consultants at PIU and D&S, along with the pool of consultants under different firms/agencies for different services, and all the representatives or staffs of construction contractors and suppliers have to play much sensitive, (pro-) active and responsible roles in abiding by the rules and measures by themselves and getting the involved workers and different stakeholders adhered to the same. A detailed guideline containing a set of measures with shared responsibilities has been sketched out in order to fight the exposure and further spread of this potentially fatal situation. This plan or guideline shall constitute an integral part of ESMP measures for every sub-project, though is not included in this report to keep it concise and specific, and the contractor is required to keep the copy of that guideline at every site office.

However, among many other relevant issues, the guidelines emphasize on following line of directives:

a. Contractor must designate one of his employees as H&S/Safeguards supervisor to lead, coordinate and interface in order to fight the COVID 19 situation under the direct guidance of COVID focal at PIU of EMCRP project.
b. All workers, supervising and supporting engineers and staffs, consultants, service providers and other concerned parties must adhere to the personal health and hygiene rules, social distancing, and other protective measures in full in order to protect themselves and contain the infections any further. Necessary training and awareness campaign will be aligned with the specific sub-project scenario and prevailing conditions.
c. General practice of cleaning and hygiene has to be maintained in all project/site offices and camp sites, and supply of necessary PPEs and cleaning /disinfecting materials along with proper use of those is to be ensured.
d. Public consultation and stakeholder engagement are to be carried out considering the prevailing risks of virus transmission in the target areas, scope of interventions and level of ICT penetrations among the target stakeholders, and so on.
e. Necessary protocols have to be established and maintained in case of handling a sick employee or worker, and appropriate compensation to a sick disengaged labor is required to be given with due documentation.
f. Budgeting for suggested protective measures, along with necessary supervision and monitoring for the required interventions has to be ensured.

Following the additional health and safety measures presented in that guideline, sub-project component specific BOQ items have been inserted to supplement the budget considering the country-specific situation, capacities, and scope of interventions. The additional cost to Health and Safety Measures under COVID 19 situation is shown in **Appendix-3.**

4.3 Cost of Environmental Enhancement Works in BOQ

In consideration to the above-mentioned environmental impacts and their mitigation measures for this sub-project component, a set of items are included in the BOQ of this sub-project component. Social Safeguard Personnel for Environmental and Social Management for Work Package EMCRP/W23 has also been added in the whole BOQ in order to take supervision and leadership to organize Environmental Management under Environmental Enhancement Works. The total costing and estimation have included enhancements such as Grass turfing plans, Tree plantation initiatives, Dust Suppression mechanisms. On the other hand, in order to ensure health safety and sanitary measures of workers PPE, First Aid Box, Labor shed, Environmental management, drinking water facility with water tests, Temporary latrine for both male and female as well as waste disposal systems has been accounted for. Ensuring sustainable labor performance in regards to environmental and social considerations motivational training has been taken into account. An overview of the estimation is given below and the detailed estimated cost to implement the ESMP is shown in **Appendix-3**.

5. LIMITATION OF THIS STUDY

Bangladesh government has imposed a nationwide lockdown to curb the spread of the novel coronavirus in the wake of series of deaths and infections. Authorities declared a ban on passenger travel on all sector from March 24 while all public transport on roads have been suspended from March 26 to stem the spread of virus, officially known as COVID-19. All office works have been postponed and an intended visit to the sites for further consultation with the relevant stakeholders has had to cancel due to this crisis. Therefore, some relevant information and arrangement needs awaiting for recovering this pandemic crisis.

6. CONCLUSION AND RECOMMENDATIONS

The overall conclusion is that if the mitigation, compensation and enhancement measures are implemented in full, there will be no significant negative environmental impacts in regards to the selection of location, design, construction, and/or operation procedure of the proposed Sub-project. There will in fact be tremendous benefits from recommended mitigation and enhancement measures and major improvements in quality of life, opportunities in business, trading jobs and ensuring social safety and security will be achieved once the scheme is in operation.

The conclusions of the Screening study can be summarized as follows:

- The communities will receive large benefits through improved infrastructural facilities, transportation & communication etc.
- The short-term negative impacts that may come by the way of air quality, noise, solid waste, occupational health & safety need to be minimized through the management plan.
- The project will create employment for those who live in the vicinity of the construction site and will provide them a short-term economic gain.
- The green belt development, if necessary, for the road site, with large-growing trees at the periphery of the site will give the places a more natural and pleasing appearance.
- A comprehensive Environmental and Social Management Plan (ESMP) has been prepared to mitigate and reduce the adverse impacts that will come out from the Subproject activities.

Implementation of this Sub-project will have large positive impacts to the communities in terms of improved infrastructural transportation & communication facilities, which would eventually develop the socio-economic condition of the catchment areas. So, strong recommendation should be put in place to implement the sub-project within shortest possible period of time, and with great care and efficiency.

Annexure-01: Important Environmental Features (IEFs) near site:

Detail Environmental features within 100m of the both sides from the center line were collected @300m longitudinal intervals. The findings of the survey for the aforementioned road can be seen in the table below:

Table: Detailed Chainage length and feature of the Sub-Project component

Road Name	Lambari para jame-E-Mosque Road Id:422945019 **(W23-7)**	**Total Chainage**	1409.0m

Chainage (m)	**Left**	**Right**	**Features**
000-300	L		Swamp, household connecting road to the left, nut tree, crop field, household connecting road to the left, nut garden, bamboo fence, household connecting road to the left, bamboo fence, garden, brick wall, households, wire fence, garden, tin fence, bamboo fence, nut tree
		R	Shop, tree, settlement, household connecting road to the right, crop field, nut trees, crop field, settlement, household connecting road to the right, tree, crop, shop, crop field, brick wall
300-600	L		Tin fence, brick wall, household connecting road to the left, bamboo fence, nut tree, crop field, wired fence, pond, garden, wired fence, bamboo fence, pond, garden, bamboo fence
		R	Brick wall, open space, bamboo fence, gardens, brick wall, open space, bamboo fence, tin fence, settlement, tin fence, crop field, pond, wired fence, nut tree garden, RCC pole with wired fence, nut trees, crop field
600-900	L		household connecting road to the left, wired fence, bamboo fence, household, vegetable yard, pond, bamboo fence, bush, swamp, no pre-existing road is present for few meters other than marshy land area, (crossing this part, again socio-environmental features can be found) bamboo bush, bamboo saku, tree, swamp, crop field
		R	Nut tree, household connecting road to the right, open space, wired fence, open space, bamboo fence, bamboo fence, open filed, nut tree, bush, swamp, crossing this part, again socio-environmental features can be found) shop, bamboo fence, settlement, bridge over borar khal, khal, bamboo bush, khal
900-1200	L		Garden, household connecting road to the left, swamp, tree, pond, household connecting road to the left, bamboo fence, crop field, bamboo fence
		R	Khal, culvert, swamp, crop field,
1200-1409	L		Crop field, household connecting road to the left, settlement, wired fence, bamboo fence, brick wall, crop field
		R	Crop field, bamboo bush, swamp, bamboo bush, bamboo fence, garden, brick wall, settlement, shop

Annexure-02: Attendance of consultation meeting

EMCRP/23.7

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)
জরুরী ভিত্তিতে রোহিঙ্গা সংকট মোকাবেলায় বাস্তি সেক্টর প্রকল্প
Local Government Engineering Department (LGED)
Public Consultation Participants List

Focus Group Discussion

সময়: 02:30 P.M তারিখ: 06/10/2020

উপ-প্রকল্প/কার্যালয়ের নাম: Lambari Para Same Mosque Road

সভা স্থলের নাম: Shop of Badiul Alam, Lambaripara

ইউনিয়ন: Jaliapalong ওয়ার্ড নং: 02 উপজেলা: Inani উপজেলা: Ukhiya জেলা: কক্সবাজার

সাব প্রজেক্ট নং: EMCRP/W23-7

অংশগ্রহণকারীদের তালিকা (পরিচয় ও স্বাক্ষর)

ক্রম নং	নাম	বয়স	পুরুষ/মহিলা	গ্রাম	স্বাক্ষর / টিপসই
০১	মোঃ আমিনুল আলম	৫০	পুরুষ	পশ্চিম পাড়া	
02	আবদুর আলম	৬২	পুরুষ	,,	
০৩	আবুল কাশিম	৪৮	পুরুষ	,,	
০৪	আবুল আলম	৩৮	,,	,,	
০৫	আবুল আলম	৪০	,,	,,	
০৬	মুন্সি ইনাম	৫৫	,,	,,	
০৭	আবুল সফুর	৫০	,,	,,	
০৮	মোঃ মোহন মঈন	৩১	,,	,,	
০৯	মোঃ আমিন মঈন	৩৫	,,	,,	
১০	কাজী আবুল হক	৭০	,,	,,	
১১	মুন্সি হাকীম	৩৮	,,	,,	
১২	মোহাম্মদ আবদুর	২০	মহিলা	,,	
১৩	আনোয়ার হোসেন	৩৫	,,	,,	
১৪	আমেনা আকির	২৫	,,	,,	
১৫	হাসেনা মুজুরী	২৫	,,	,,	
১৬	মুন্সি হাজেরা	২৬	,,	,,	
১৭	হাসেনা বেগম	২৯	,,	,,	

EMCRP/W23.7

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)
জরুরী ভিত্তিতে রোহিঙ্গা সংকট মোকাবেলায় বহুখী সেক্টর প্রকল্প
Local Government Engineering Department (LGED)
Public Consultation Participants List

Focus Group Discussion

সময়: 12:30 PM তারিখ: 06/10/2020

উপ-প্রকল্প/কমপোনেন্ট এর নাম: Lambaripara Jame Mosque Road

যে স্থানে হয়: Shop of Badiul Alam, Lambaripara

ইউনিয়ন: Jaliapalong ওয়ার্ড নং: 02 মৌজা: Inani উপজেলা: Ukhiya জেলা: কক্সবাজার

সাব প্রজেক্ট নং: EMCRP/W23-7

অংশগ্রহণকারীদের তালিকা (পরিচয় ও স্বাক্ষর)

ক্রম নং	নাম	বয়স	পুরুষ/মহিলা	গ্রাম	স্বাক্ষর / টিপসই
১৮	কামাল হোসেন	৩৪	পুরুষ	লম্বরী পাড়া	
১৯	আফিয়া	৫৫	〃	〃	
20	হাবিবুল্লাহ	৪৮	পুরুষ	〃	
২১	মোঃ রফিকার	৩৫	পুরুষ	〃	
২২	মোঃ জমসের	৪০	পুরুষ	〃	
২৩	আবিবুল্লাহ	২৬	পুরুষ	〃	
২৪	মোঃ আবদুর	৩৭	〃	〃	
২৫	আহমদ হোসেন	৩৫	পুরুষ	〃	
২৬	মইনুল ইসলাম	২২	পুরুষ	〃	
২৭	মোঃ মুনছুর	৪৫	পুরুষ	〃	
২৮	মোসা মেহের	৩৫	পুরুষ	লিচুর বিলা	
২৯	ফাতেমা	৩৮	〃	〃	
৩০	আবুল কাশেম	৫৫	পুরুষ	〃	
৩১	মোঃ আমেনা	৫২	পুরুষ	〃	
৩২	মোঃ রিজিয়া	২৭	〃	〃	
৩৩	〃 সকিনা	১৮	〃	〃	
৩৪	ফরিদ আহমদ	৫২	পুরুষ	উত্তর লম্বরী পাড়া	

Figure: Attendance of consultation meeting for W23-7

Annexure-03: Pictures of sub-project component location and surrounding features with public consultation













Figures: Present condition of Lambari para jame-E-Mosque Road (W23-7) & Public Consultation meeting with Host community

Appendix-1: Environmental Screening Form for examining sub-project component

Environmental Screening Form for Sub-project W23-7

Sub-Project Description Form:

EMCRP/W23- Improvement of 15 roads and construction of culverts with side drains under Cox's Bazar District

Name of Sub-Project: Lambari para jame-E-Mosque Road Id:422945019

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Estimated total cost of sub-project (in Taka): 417,036,298.10 Tk.

Estimated construction period duration: 1 year

Estimated total cost of the component (in Taka): **37,833,988.26 Tk.**

Estimated Operation and Maintenance period (life of sub-project): Project design life more than 15 (Fifteen) years but Government policies on how long projects can operate in the camps.

District: Cox's Bazar **Sub-District**: Ukhiya **Union**: Jaliapalong

Name of Community/Local Area: Lomboripara (Uttorpara), Dighir beel (Uttorpara), North-East Shonaichori

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):
The Sub-Project is categorized as a village road-A with a proposed design of Bituminous Carpeting through construction of Earth Work. Interventions include **06 nos. Cross Drain (dimension: 0.975mX 0.975m) at** Ch. 811m, Ch. 1267m, Ch. 1321m, Ch. 1752.0m, Ch.1846.0m, Ch. 2070.0m, **and 01 nos. Box Culverts** (dimension: 2.0mX2.0m) at Ch. 1590, **374.0m Palisading wall** and **388.0m Toe wall**. **Road safety** work and **Environmental Mitigation and Enhancement** works are also included. Road safety works are also included in the project activity.

Estimated footprint / land area for this sub-project is 6,904.1 sq. meter

Brief description of sub-project site: (e.g. present land use, Important Environmental Features (IEFs) near site, etc.:

Proposed road is situated within the catchment area of Lomboripara (Uttorpara), Dighir beel (Uttorpara), North-East Shonaichori stretching 2340 meters. This road starts from Westpara of Lomboripara and ends near rejur khal. Being one of the local communities of Ukhia upazila these locations are very familiar to any other part of rural Bangladesh having mosques, village households, agriculture fields to grow crops and vegetation that serves as subsistent gardening. The surrounding area is dominated with agriculture practices as rice production, betel leaf production, vegetable farming etc. Majority of the surrounding space of this intervention is covered with homestead

gardens and forests. However, there are no significant eco-sensitive features on the pathway of this proposed road.

Overall Comments

The proposed component of the sub-project (Road construction) is not located within any remarkable environmentally sensitive area and will not cause any severe affect to the environmental settings of the area, thus not going to create intimidation to important environmental features. No drainage congestion/water loggings have been observed in the road area. But, some local trees like betel nut tree, rain tree, mango tree, bamboo bushes etc., or additional vegetation may need to clear out due to construction activities, with appropriate offsetting measures to be taken. No agricultural productive soil will be used for the purpose. Earth will be compacted for stabilization. The inputs will be mainly at construction phase and limited within project boundary. Moreover, mitigation measures will be taken according to the ESMP for minimizing the air, dust and noise pollution.

It has been revealed that this project's scopes of works do not intend to overtake their area of lodgment and funding entity has no intention to do so. Moreover, other issue has also been brought to their attention that drainage system and a bridge have also been included into the evaluation of this project since runoff from higher grounds are also a concerning matter during rainy season.

People of the subproject area are very much optimistic about the success of the project and are also eager to participate in the project activities. The subproject is environmentally sustainable and socially acceptable. The local community attended in the participatory public consultation meeting. Their community representatives as teachers, shop owners, farmers and elders have no objection to the construction this infrastructure in the proposed site; the community also appreciated the initiative of LGED to ensure safe access and better portability. The public consultation meeting results confirmed that improvement of this road will increase socio-economic interest in the communities and make lives easier for these people. They also requested to construct the road in accessible width so that small auto and motor vehicles can pass easily. Water flow from undulated terrains is a factor that should be considered for construction because 1 week worth of rain invites water flow which makes this surrounding area logged in several places. On another matter, locals requested to involve the local community to construction works and material storage monitoring duties.

The road is not located within any identified environmentally sensitive area, and therefore, does not seem to cause any adverse impact on the important environmental features. No significant impact is expected on the ecosystem and biodiversity, no agricultural land/ activities or fish farming will be disturbed, due to the construction of the sub projects. Only forest is found as homestead forest on high grounds of the location.

Types of waste to be generated during construction and operation phase:
During construction period solid waste will be generated due to construction activities. The types of wastes are brick pit, unused sand, wood, gravels, bitumen etc. The types of wastes are gravel, stones, rock, wood, copper wires, concrete, iron, plastic etc. Negligible amount of plastic will come as residue. Moreover, liquid waste will include chemicals of bitumen leftovers, motor oils, used oil,

Degreasing solvents etc. Human wastes and kitchen wastes will be generated from labor camps as well.

Sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site including elephant migration routes and remaining forests:

Within the influence area of the subproject no historical sites were identified. Sensitive environmental, cultural, archaeological, religious sites within 1 kilometer of site includes including Old Graveyard (300m), Rejur khal(100m) to the North. Shoudagorpara Madrassa (20m), Baitul Karim Jame Mosque(300m) to the south. Households (30m) to the east and Lomboripara GPS (20m), Lomboripara Jame Mosque (50m), Lomboripara Hefzokhana (60m) to the west. Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists.

Mostly human settlements are found around the sub-project area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). Elephant migration routes were about 5-6 km away from this sub-project. No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below

Section A: Sub-Project Overview

Description of sub-project/component interventions:

This intervention will include the following items;

- **06 nos. Cross Drain (dimension: 0.975mX 0.975m) at** Ch. 811m, Ch. 1267m, Ch. 1321m, Ch. 1752.0m, Ch.1846.0m, Ch. 2070.0m,
- **01 nos. Box Culverts** (dimension: 2.0mX2.0m) at Ch. 1590, **374.0m**
- **Palisading wall**
- **388.0m Toe wall**
- **Road safety** work and **Environmental Mitigation and Enhancement** works are also included (description of such items can be found in BOQ)

Sub-project Location:

Important Features	
ID	422945019
District	Cox's Bazar
Upazila	Ukhiya
Union	Jaliapalong
WARD	02
Proposed Chainage	2340m
Road Type	Village Road-A
Proposed Intervention Type	BC
Distance from Upazila HQ	05km
Road Starting Point Coordinates and name	Latitude: 21.288760 N Longitude: 92.081990 E Road starts from Westpara of Lomboripara

Road Ending Point Coordinates and name	Latitude: *21.289870 N* Longitude: 92.072490 E Ends in near Rejur Khal

Land ownership
Government Land

Expected construction period: 1 Year

Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water bodies, etc. and historical or socio-cultural assets): Please also explain any analysis on alternative location was conducted:

Old Graveyard (300m), Rejur khal(100m) to the North. Shoudagorpara Madrassa (20m), Baitul Karim Jame Mosque(300m) to the south. Households (30m) to the east and Lomboripara GPS (20m), Lomboripara Jame Mosque (50m), Lomboripara Hefzokhana (60m) to the west. Within the influence area of the subproject no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (checked with local IUCN representative).

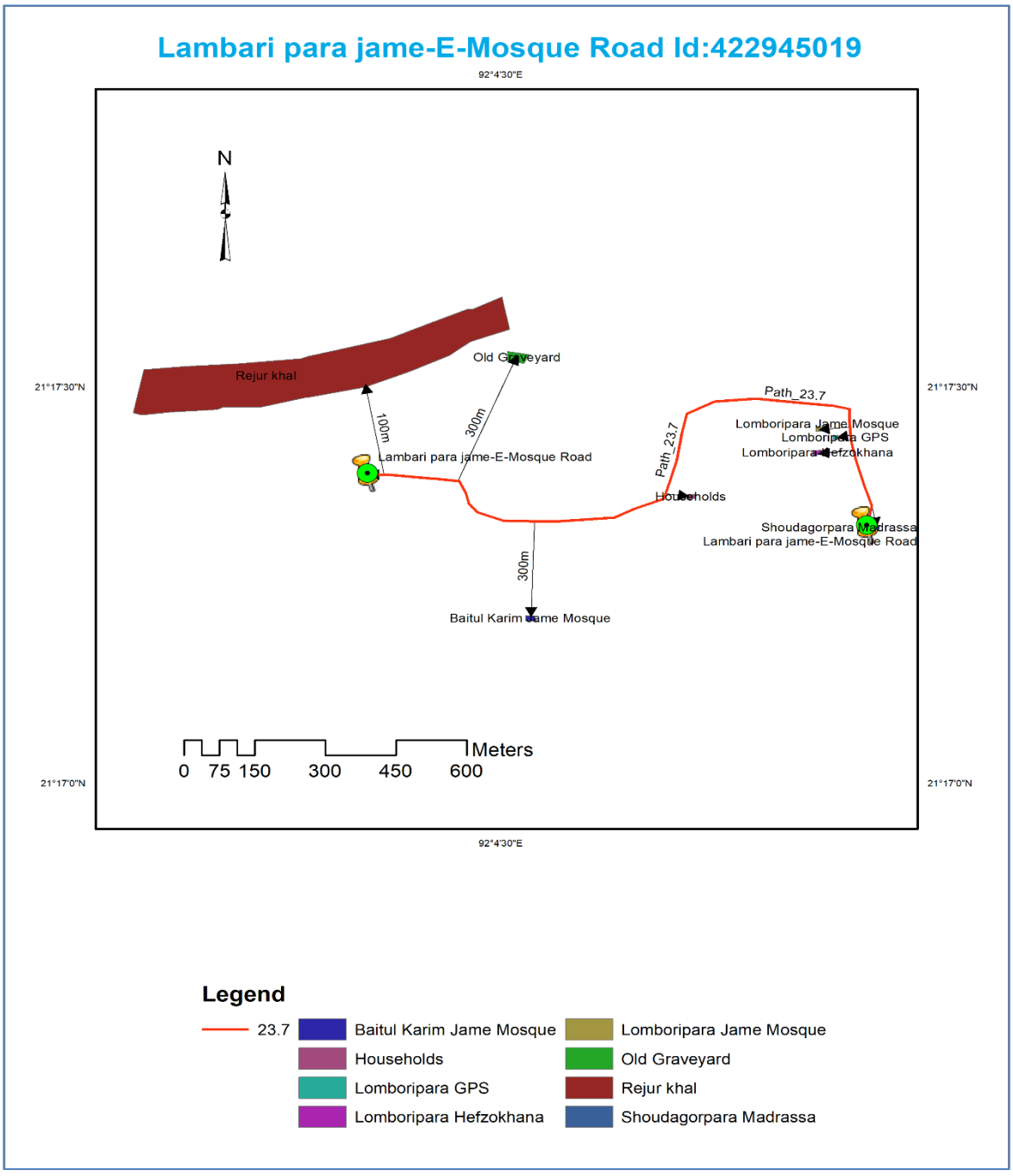
Section B: Environmental Screening

***B.1*: Environmental feature of sub-project location**

Description of cultural properties (if applicable, including distance from site):
Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests:

Old Graveyard (300m), Rejur khal(100m) to the North. Shoudagorpara Madrassa (20m), Baitul Karim Jame Mosque(300m) to the south. Households (30m) to the east and Lomboripara GPS (20m), Lomboripara Jame Mosque (50m), Lomboripara Hefzokhana (60m) to the west. There are no other sensitive environmental, cultural, archaeological sites within the catchment area of this sub-project.

A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas are shown below.



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive features found in the footprint area, except matured vegetation on the sides of the road which are homestead gardens and forest. Several mosques, madrasa and local settlement were found during the survey. It will not be affected by the construction works, as the activities will be carried out within the existing subproject boundary and necessary preventive and mitigation measures will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*
No. There is no existence of Elephant corridor/ route now, which have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) potential impacts on remaining forests in/around camps Yes/No
N/A (This activity will be confined within the existing subproject boundary)

(3) Other issues: N/A

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:
Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of vehicle-related pollutants 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/ preventable by mitigation measures.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, tractor, trailer, etc. move on roads adjacent to sub-project throughout the day and night generate noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation):

Landslide potential is low. There is low possibility of soil erosion or landslide during construction period of targeted sub-project. The impacts are negative but very small scale, site-specific within a relatively small area and adjustable by mitigation measures.

Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH):

Groundwater is the main source of potable water in the Sub-project area. The shallow depth is about 50 feet to 100 feet and deep tube well depth is 850 to 900 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains

medium concentration of iron. Deep groundwater table (drinkable) varies from 600-800ft (Field survey, 2019). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer. Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)
Status of wildlife movement: **N/A** (None of the information was found about the wildlife movement in or across the area)
State of forestation: Patches of vegetation containing large and matured trees are present in local and homestead gardens across the road side of the proposed subproject area which are located within 200m radial distance.
Summary of water balance analysis (For water supply scheme only): **N/A**

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g. status of access road or any other facility required for sub-project to be viable): An access point called Lomboripara Road is available. It is possible to carry construction materials on these roads to the construction site with limited traffic flow to avoid congestion.
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction: Toilet and water supply facilities will be ensured by the contractor in the vicinity of the construction area for all the components of the sub-project, electric connection will be established with the accommodation facility due for the workforce. Electricity is available in the area.
Possible location of labor camps: Labor camp can be established along the road since there are available open private lands. However, this will have to be done with the consent of land owner under a mutual agreement, with the supervision of the Engineer in charge.
Requirement and type of raw materials (e.g. sand, stone, wood, etc.): i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction.
Identification of access road for transportation (Yes/No):

Yes. Lomboripara road available as connecting road
Location identification for raw material storage: Adjacent to labor camp or different location is available. However, this will need placement on open fields and should be consulted with local committee. Material storage area must be well fenced and materials will be covered with tarpaulins.
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.): Earth/ mud, plastics, brick chips, dust from bricks during construction of project components will be produce. Also, sludge will be produced from labor camp latrines and kitchen waste mostly composing of organic matters as fiber, starch, carbohydrates and proteins. 10% of the kitchen waste may be classified as plastics or non-biodegradables. Solid waste may amount to 20 kg daily and sludge may amount to 5 kg per day.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g. Solids wastes, liquid wastes, etc.): **Solid waste:** Residual waste from the labor camps will be generated. Equipment maintenance/vehicles on-site and scrap material will occur during construction works which are mostly solid waste. Leftover oils or spills from machinery can be a high probability generating liquid waste. Waste from civil works. And the quantity will be tentatively 150 kg. **Liquid waste**: During construction period fecal sludge will be generated from the labor camp and the quantity would be nearly 6 kg per day, which would be reduced in weight in course of time. Leftover oils or spills from machinery can be a high probability generating liquid waste.
Type and quantity of raw materials used (wood, bricks, cement, water, etc.): **Type:** i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction. **Quantity**: It is difficult to give exact figures of construction waste produced on a typical construction site.
Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards: No such vegetation is present in the right of way. Specific soil amount is not needed for the project. The current condition explains that there is no aggregated soil on the right of way.
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito

breeding and other disease vectors: (High/Medium/Low with explanation) The possibility is Medium, for stagnant water bodies to occur. Because water usage will be higher during the construction period. By default, this area has no water logging troubles due to being natural channels. Moreover, no possibilities of stagnation of water in long run. So, local communities have stated that they do not have severe troubles with mosquitos or other disease vectors.
Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) At the end of this road Rejur Khal resides but no modification or impact is expected for this intervention.
Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. Because under this intervention, there is very little scope of damage to terrestrial or aquatic ecosystems or endangered species.
Activities that can lead to landslides, slumps, slips and other mass movements in road cuts: Scope of work leading to low scale effects of landslide. The impacts are negative but short-term and site-specific. It can be managed through mitigation measures.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description) Low, since both sides of the road is more or less similar elevation. The concentrated outflow will be managed since the sub-project has included drains.
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: No
Chance of long-term or semi-permanent destruction of soils: (High/Medium/Low with description) No
Possibility of odor and water, soil quality impacts from SWM and FSM disposal system: (High/Medium/Low with description)

No.
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) There is no possibility of stagnant water bodies remained for encouraging mosquito breeding and other disease vectors, during the operation phase.
Likely direct and indirect impacts on economic development in the project areas by the sub-project: Construction or implementation of a road project substantially contributes to the development of the project areas. It surely improves the communication network, reduces the transport time, increases the trade and business in/around the areas, and ensures access to better living conditions with amenities, better educational and job opportunities and health facilities. Thus, the direct and indirect impacts on economic development in the project areas would be enormous by this sub-project.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No existing drainage channels or surface water bodies found in the project area; therefore, no such effect can be anticipated
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. There are no protected areas in or around project sites, and no known areas of ecological interest.
Activities leading to landslides, slumps, slips and other mass movements in road cuts: The entire sub-project component area is nearly flat; thus, no such type of impacts is anticipated.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) No
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: Improved communication will definitely increase the traffic/ vehicular movement, which must increase the light and noise pollution, but air pollution effect will not be increased significantly, as the proposed BC road will reduce the pollution generated from dust on the muddy road, especially during the dry season and if the vehicles are maintained in good conditions

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

Section D: Environmental Screening Summary of the Work Package-23.7

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
1: Sub-Project Interventions	**Air quality**	Under the subproject intervention the overall score is **low**.	• Limiting earthworks; • Watering of dry exposed surfaces and stockpiles of aggregates at least twice daily, as necessary; • Requiring trucks delivering aggregates or bricks and cement to have tarpaulin cover and Limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Covering of trucks; • Records of air quality inspection;	Visual monitoring of air quality and if requires, air quality test (CO, $PM_{2.5,10}$) once in construction period in winter season.
	Soil impacts	Under the sub-project intervention the overall score is **low.**	• Precautions might be taken when rainstorms are likely, when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms. • The earthwork sites where exposed land surface is vulnerable to runoff shall be consolidated and/or covered. • The material stockpile sites shall be far away from surface water bodies and areas prone to surface run-off. Loose materials shall be bagged and covered. • Channels, earth bunds, netting, tarpaulin and or sand bag barriers	Construction Contractor monitored by Consultant and PIU	• No visible degradation to nearby drainages, • *khals* or water bodies due to soil erosion. • Rain storms in construction phase.	Monitoring as weekly basis.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
			shall be used on site to manage surface water runoff and minimize erosion. • The overall slope of the work areas and construction yards shall be kept to a minimum to reduce the erosive potential of surface water flows elsewhere.			
	Hydrology (surface and groundwater)	Under the subproject intervention the overall score is **low**.	• All precautions to store chemicals/oil/fuel properly so that no chance of spill. • Workers must specify waste dump locations to avoid littering which in turn might negatively affect surface and ground water. • Monitor water quality according to the environmental management plan.	Construction Contractor and monitored by Consultant and PIU	• Areas for stockpiles, storage of fuels and lubricants and waste materials; • Records of water quality inspection; Water Quality Test • (National Drinking Water Quality Standard Parameters)if requires; • No visible degradation to nearby drainages, *khals* or water bodies due to	Water quality test (mainly GW) twice during the construction period in six months interval.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
					construction activities. • Records should be kept and logged.	
2: Pre-construction Phase	**Sanitation, water supply**	Under the subproject intervention the overall score is **low**.	• Provide suitable housing, adequate supplies of potable water, and toilet and bathing facilities within labor camp area for the assigned laborer. • Provide means for disposing of wastewater from toilets, baths and food preparation areas either through a septic tank and soak away, or holding tank with removal by vacuum truck. • Records for any type of training or awareness building sessions must be kept at site.	Construction Contractor and monitored by Consultant and PIU	• Site-specific H&S Plan; • Records of supply of uncontaminated water; • Record of Health &Safety orientation trainings; • Condition of sanitation facilities for workers	Visual inspection by PIU and supervision consultants on monthly basis
	Transportation	Under the subproject intervention the overall score is **low.**	• Contractor should verify vehicles for the suitability of carrying, loading and unloading of materials	Construction Contractor and monitored by Consultant and PIU	• Record of regular inspection. • Record of accidents/incidents	Monthly monitoring.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
	Storage of construction materials	Under the subproject intervention the overall score is **low**.	• Orienting concerned person and team assigned for the construction work.	Construction Contractor and monitored by Consultant and PIU	• List of materials and sources of materials;	During implementation phase, as necessary with discussion with PIU, Consultant
3: Construction Phase	**Wastes**	Under the sub-project intervention the overall score is **low.**	• Prepare and implement on-site waste water runoff and labor camp waste management plan approved by PIU and consultants. • Wastes must be placed in the designated bins which must be regularly emptied. These shall remain within demarcated areas and shall be designed to prevent wastes from being blown out by wind. • All waste must be removed from the site and transported to a disposal site.	Construction Contractor and monitored by Consultant and PIU	• Complaints from community; • Regular inspection of waste management activity; • Waste disposal record.	As work weekly progresses
	Cut and fill Activities (Cutting of hill slope and earth removal from borrow areas caused for soil erosion and	Under the sub-project intervention, the overall score is low.	• During construction cut and fill will be balanced as far as is possible. Designs shall ensure that as far as possible all cut and fill activities are balanced • Proper care will be taken during cutting and filling so that slope or toe of the road embankment	Contractor, environmental specialist of D&SC	• Location of road alignment and slope.	Daily as work progresses

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
	landslides)		remain within the right of way and does not disturb the crop.			
	Storage of materials	Protected and safety storage to be needed for construction materials storage. Not interrupt natural land contours, disturbance in natural drainage patterns and logging of water and the overall score is **low.**	• With the assistance from site management committee in Camp to identify the storage site and other requirements, which will be approved by PIU and consultants.	Construction Contractor and monitored by Consultant and PIU	• List of materials and sources of materials; • Storage areas for materials and equipment.	Monthly basis during implementation phase, as necessary with discussion with PIU, Consultant
	Removal of Vegetation (May cause soil erosion and their deposition on nearby crop field, affecting soil quality and productivity)	Under the sub-project intervention, the overall score is **low.**	• If during detailed design cutting of trees is required, compensatory plantation for trees lost at a rate of 5 trees for every tree cut. • Prevent workers or any other person from removing and damaging any flora (plant/vegetation) and fauna.	Contractor, environmental specialist of D&SC	• Complaints from community;	Daily

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
	Noise pollution	Under the subproject intervention the overall score is **low.**	• Consultation with affected people; not to operate noisy equipment during working period; • No noisy work after 5.00 pm. • Sound suppression for equipment; • Ear protection for workers. • Conduct noise quality monitoring as per EMP.	Construction Contractor and monitored by Consultant and PIU	• Number of complaints from stakeholders; • Use of silencers in noise-producing equipment and sound barriers; • Noise Level following decibel meter (dB)	Inspection by PIU and supervision consultants on monthly basis;
	Air pollution	Under the subproject intervention the overall score is **low.**	• Water spraying for dust control; construction materials with potential for significant dust generation shall be covered; no smoke emitting equipment; and limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor and monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Records of air quality inspection.	Visual observation and monitoring of air quality during construction period.
	Road Safety and Accidents	Under the subproject intervention the overall score is **low.**	• Erection of suitable signage at construction sites • Direct observation and discussion with local people • Restrict the transport of oversize loads. • Operate construction vehicles to non-peak periods (night) to minimize the traffic disruption. • Enforce on-site and access road speed limits.	Construction Contractor, environmental specialist of D&Sc.	• Complaints from communities, pedestrians	Day basis during work time

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
			• The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc. • Local residents should be kept informed about planned Works			
4. Post Construction	**Road Safety**	Under the issue the overall score is **low**.	• Install traffic signs for speed limit, speed breaker where needed, Mile post and create adequate ***traffic*** detours, and sufficient ***signage*** & ***warning*** signs, Post speed limits and suitable bending on the road. • The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc.	Construction Contractor, environmental specialist of D&Sc	• Road signage and safety instruments at suitable locations and chainage	Immediately after the construction work is over.
	Tree re plantation	Under the issue the overall score is **low**.	• Replantation of trees during monsoon period • Maintain of trees properly • Check survival of trees and replant the dead trees	Construction Contractor, environmental specialist of D&Sc	• Number of complaints from stakeholders; • Records of trees number and tree plantation inspection;	Immediately after the construction work is over.
5.	**Maintenance**	Under the issue	• No advertisement/boardings shall	LGED	• Number of	During Operation

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
Operational Phase	**of road and assets** (Road accidents may increase due to higher number of vehicles using the roads at increased speeds)	the overall score is **low**.	be allowed within the Right of Way limits of the project road. • Regular maintenance and cleaning of assets such as sign boards, road safety sign etc. shall be undertaken. • Clear smooth speed breaker/rough surfaces should be clear in views. • Regular maintenance of road surface and shoulders.		complaints from stakeholders;	under LGED's regular maintenance program in each 3 years.

* Overall Impact Score: High = Likely to cause long-term E&S impacts; Medium = Likely to cause temporary impacts; Low = Likely to cause little, short-term impacts

**Post-construction phase denotes the time period contractor use to clear and clean up the sites after the construction work is ended, perform tree plantation, grass turfing, and minor rectification till the official handing over the site to LGED, or owner of the site.

Recommendation for further environmental and social assessment and/or site specific environmental and social management plan: Yes

**If yes, please specify what assessments/plans would be required.* Mention some recommendation on E&S assessment …. ESMP

If site specific environmental and social management plan (ESMP) is followed the impacts can be mitigated and monitored. ESMP is attached.

Appendix-2: Environmental and Social Management Plan (ESMP)

ESMP for Access and evacuation Roads; *(LGED/EMCRP-W23.7):* Lambari para jame-E-Mosque Road Id:422945019

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
Pre-Construction Stage	Loss of land / and other physical assets	• No land acquisition is allowed within this sub-project activities So, there are no any mitigation measures according to this impact.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of livelihood	• Under this subproject, there is no scope of negative impact of adjacent livelihoods	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Stakeholders Engagement	• All of the project stakeholders should be consulted • Separate community level consultation meeting with the potential affected HHs • Consultation meeting with host communities about the project objectives and scope of works	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of right to access	• Project to ensure thorough analysis of alternatives that access enjoyed by the community remains intact. • In case of unavoidable circumstances, alternative access will be provided.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Site Selection & implementing interventions: Human-elephant conflict	• Selection of sub-project sites and all implementing interventions must take place outside of the elephant corridor/influence area.	PIU	Environmental Consultant of PIU, PSC
Pre-Construction Stage	Site Preparation: Soil Erosion; Alteration of natural drainage	• Our selected sites avoided the low land near the water bodies or natural flow path to avoid the flash flood or any kind or surface runoff.	PIU & Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Tubewell location within the construction site is not near to any kinds of latrine and soaks well which could be contaminated by those. • After completing the development we restored the place as like before to avoid the cut and fill operational problems. • This site is in the local community, so we discussed with the local community to avoid any conflicts related local habitation, culture. • Sub project intervention mustavoid of natural disturbance of existing slop and natural drainage. • The contractor ensuring sound environment for the local residents near the sub project site.		
Construction Activity	Noise from construction works	• Construction activities mostly will finish at day time within 05 PM, and must confirm proper measures for avoiding any disturbance. • All Personal Protective Equipments (PPEs) must be ensured in sites before starting any kinds of construction works.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Dust	• Acceptable range of emission of CO, particulate matter [SPM (**Suspended particulate matter)**, PM2.5, 10] and Hydrocarbons must be maintained through good construction work practices • Dust generation must be limited as a result of clearing, leveling and site grading operations with	Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		using water florescent manually and through water pipes. • Dust generation due to vehicle movement on connecting road shall be controlled by watering the path at limited level		
Construction Activity	Safety Issues	• Unauthorized entry is completely prohibited in our site and take necessary measures for preventing this problem • Before works started Contractor must provide proper training and guidelines on health and safety issues to the labors and associated staffs. • Records of every training must be kept at site. • All kinds of Child labour are completely prohibited in every site. • Every construction materials storage site will be well fenced by Tin and safety caution tape.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Traffic Management	• Contractors will maintain proper route for traffic management which is to beconsulted with and confirmed by the Executive Engineer of Cox's Bazar.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Conflicts with existing users due to the scarcity of resource base.	• A detailed assessment of the available resources and consent of the local representative for withdrawal of water from existing surface water sources shall be taken. • If ground water is withdrawn, adequate approvals from the appropriate department need to be undertaken before setting up bore wells.	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Any type of consent letter or agreement for withdrawing water from either surface or underground sources will be kept on site. • Local community must be consulted before any construction works starts.		
Construction Activity	Increase in road accidents	• Maintain safety measures during the movement of heavy machinery and equipment. • Local community will be trained up on traffic management and awareness.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Labour Base Camp: Conflicts with the local residents	• Awareness building session will be undertaken about prevention of child abuse, child marriage, GBV, sexual harassment, trafficking of women and children as well as illegal drug trade. Written records of this awareness building session shall be kept on site. • Work force should be prohibited from disturbing the flora, fauna including hunting of animals, wildlife hunting, poaching and tree felling. • Adequate facilities ensuring sanitation for labour camps will be put in place • Treated water will be made available at site for drinking purpose. • Adequate accommodation arrangements for labour forces. • Labor code of conduct is to be disclosed through consultation.	Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Construction Activity	Waste Management: Improper	Preparation of a waste management plan covering the	Contractor	Environmental

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
	management and handling of hazardous and non-hazardous waste during construction.	following aspects: • Residual waste from the temporary accommodation facilities for labor Waste and from equipment maintenance/vehicles on-site • After completion of construction works. So, recycling process is not applicable. • Proper consents for hazardous waste management.		Consultant of PIU, PSC
Construction Activity	Health & Safety Risks: • The potential for exposure to safety events such as tripping, working at height activities, fire from hot works, smoking, failure in electrical installation, mobile plant and vehicles, and electrical shocks. • Exposure to health events during construction activities such as manual handling and musculoskeletal disorders, hand-arm vibration, temporary or permanent hearing loss, heat stress, and dermatitis.	• All construction equipment will be properly inspected timely. • The risk assessment will be prepared and communicated prior to the commencement of work for all types of work activities on site. • Preparation of proper walkways and clearly designation as a walkway has to be ensured; all walkways shall be provided with good conditions underfoot; signposted and with adequate lighting. • Proper Signpost at any slippery areas will be ensured in construction site. • Fire extinguishers will be located at identified fire points around the site. The extinguishers must be appropriate to the nature of the potential fire. • This sub project has Proper communicative emergency response plan (ERP) with all parties, the ERP to consider such things as specific foreseeable emergency situations, organizational roles and authorities' responsibilities and expertise, emergency	PIU & Contractor	Environmental Consultant as well as Social Development and Gender Specialists of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		response and evacuation procedure and personnel will be trained and drilled to test and ensure the coherence with the plan. • All people of construction site will be concerned about the safety and maintenance of Electrical equipment; works will be carried out on live systems. • Provision to first aid box in sub-project areas will be ensured. • Proper Emergency evacuation response plan will exist in sub-project area. • All safety equipment will be available in sub-project site (safety, size, power, efficiency, ergonomics, cost, user acceptability etc.), the lowest vibration tools will be provided that are suitable and can do the works. • Awareness training will be given to all personnel involved during the construction phase in order to highlight the heat related illnesses of working in hot conditions such as heat cramps, heat exhaustion, heat stroke, and dehydration. Written records of this awareness training shall be kept on site. • Adequate quantities of drinking water will be available at all Sites, on different locations within the site. • Provision to maintain proper PPE wherever necessary and to ensure that there are satisfactory washing and changing facilities.		

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Provision to ensure all workers exposed to a risk are aware of the possible dangers and also given thorough training on how to protect themselves and there should be effective supervision to ensure that the correct methods are being used.		
Operation &Maintenance	Noise disturbances to fauna	• Provision to maintain noise and vibration from the operation and maintenance of machinery and equipment by proper monitoring and measures. • Provision to take necessary lighting, caution for the works and necessary maintenance should be done in day light.	PIU	Environmental Consultant of PIU, PSC. Union Member
Construction activity	Odours and pollution caused by leaking latrines and faecal sludge, and solid wastes impacting surrounding water bodies, flora and fauna	• Preventative maintenance schedule should be followed. • Solid organic wastes should be stored in bins and/ or skips and emptied regularly at a designated waste disposal area away from the camp site. If no designated site is available within the reach, a dug-hole at a nearby place can be used with periodic filling with soil layer for preventing pollution and generating nutrient rich compost soil over time.	PIU	Environmental Consultant of PIU, PSC. Union Member
Decommissioning during the project implementation period (including site clearance after the construction)	The impacts are similar to those listed in construction stage: • Pollution from waste materials • Health & Safety risks to workers and local community	• Contractor must prepare a demolition and waste management plan including following directive aspects given hereunder.	PIU / Contractor	Environmental Consultant of PIU, and Executive Engineer of Cox's Bazar

Waste Management Plan:

The Contractor shall develop a waste management plan for various specific waste streams (e.g., reusable waste, flammable waste, construction debris, food and organic waste etc.) prior to commencing of construction and submit to LGED for approval. The plans must include following principles or series of actions, which will be carried out/followed by the contractor and supervised by the Field level Environmental Specialist and Social Development Specialist.

For wastes:

- The quantity of waste materials shall be minimized by 3R (Reduce, Recycle and Reuse) approach, and wastes shall be segregated accordingly, wherever practical; and stored in designated places/facilities in the site.
- Construction site shall be maintained in a cleaner, tidy and safe condition and appropriate facilities shall be provided and maintained as temporary storage of all wastes before transportation and final disposal.
- Hazardous waste viz. waste oil etc. will be collected and stored in a paved and bounded area and subsequently sold to authorized recyclers.
- The scrap material generated from related construction activities will be collected and stored separately in the stack yard and sold to local recyclers.
- All wastes generated during construction shall be disposed off in an environmentally acceptable manner. This will include consideration of the nature and location of disposal site, so as to cause less environmental impact.
- Other leftover non-hazardous wastes, including construction debris shall be transported to an approved disposal site by pick up tracks or back loaded vehicles with proper care.
- Organic wastes produced in the camp site during the construction period shall be collected and transported in vehicles covered with tarps or nets to prevent spilling waste along the route to the designated disposal site;
- Burning of any type of wastes in the construction site shall be prohibited completely.

Prepared by: Harogopal Kabiraj, Environmental Focal Person, +8801714980171

Tanvir Ahsan Haque, Environmental Specialist, +8801688117059

Ms. Sadia Azad, Disaster and Climate Change Specialist, PIU.

Reviewed by: Md. Saiful Islam, Field Level Environmental Specialist, +8801913442006

Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for this sub-project component under work package EMCRP/W23.7

In consideration to the above-mentioned environmental impacts and their mitigation measures for all sub-projects, individual BOQ for each component has been prepared. Following tables will illustrate such items of enhancement and impact mitigation works as well as considering the emerged situation of COVID-19, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites.

Cost of Environmental Enhancement Works for W23-7 in BOQ

Sl no.	Description of item	Quantity	Unit price	Total amount
1.	**Grass Turfing** Turfing on embankment top and slope & any critical place with good quality turf supplied by the contractor of not less than 225mm square in dimension including placing and watering till grass is fully grown, etc. all complete as per direction of E.I.C. (Payment to be made only when grass is fully grown)	6977.20S q.m	@38.15 Tk. Per sqm	266180.18
2.	**Dust suppression measures** Dust suppression measures like water sprinkling on aggregates/unpaved roads, in and around the work site and as per direction of E-I-C	2340.0m	@ 2.56 BDT	5990.40
3.	**Water Supply and Sanitation** Providing and maintaining adequate portable water supply, sanitation, cleanliness facilities at camp site and work site to the entire satisfaction of Engineer-in-charge. **Temporary Toilet:** Construction of temporary toilets in work site/ rest area complete as per design and specifications and approved by the Engineer-in-Charge. There should be 1 camp in each site. In each camp, there should be 1 no of toilet for women and 1 no of toilet for men.	2 nos.	@12822.86 per toilet	25,645.72

Sl no.	Description of item	Quantity	Unit price	Total amount
4.	**First Aid Box** Supplying, equipping and maintaining adequate first-aid box throughout the working period at worksite and site office, and erect conspicuous notice boards directing where these are situated and providing all requisite emergency medical first aid kits, including complying with the government medical or labour requirements at all times, and provide, equip and maintain necessary dressing kits throughout the working period for attending minor injuries, etc. all complete as per requirement and full satisfaction of Engineer-in-charge.	1 no.	LS @5000 Tk. Per box	5,000
5.	**Drinking Water Facilities** Providing continuous adequate drinking water supply at worksite and site office as well by installing necessary tube-well/s where applicable or any other means depending on local situation, also providing essential arrangement for storing drinking water by supplying portable best quality water tank equivalent to Gazi/Padma of adequate capacity depending on the number of users, including supplying 1 (one) no. best quality water filter of minimum capacity 30 liters with necessary kits, etc. all complete as per satisfaction and direction of the Engineer-in-charge.	2 no.	LS @ Tk. 30,000	60,000
6.	**Traffic Management** Maintaining traffic management at worksite from time of commencement of contractor's activities to time of completion activities, including ensuring that the road is safe for users, providing a safe working area for those involved in work on trafficked network and minimizing any disruption to smooth flow of traffic (this includes providing necessary barricades, warning signs/lights, guide signs, flagmen, maintaining diversion roads by cutting, filling, constructing, etc. or by any other means) in accordance with the full satisfaction of the Engineering-in-charge.	1 no.	LS @ Tk. 15,000	15,000

Sl no.	Description of item	Quantity	Unit price	Total amount
7.	**Personal Protection Equipment for Workers** Providing and maintaining appropriate (safe design, fit and comfort) personal protection equipment (PPE) to ensure the highest possible protection for employees in establishing and maintaining a safe and healthful working environment at workplace, including demonstrating, providing training on proper understanding and development of skill in the use of PPE, including supplying (i) best quality safety jacket, (ii) suitable hand protection gloves, (iii) appropriate foot protection shoes, (iv) best quality safety helmets, face shields, ear muffs etc. (v) suitable eye protection goggles	LS	LS @ Tk 30,000	30,000
8.	**Tree plantation** Tree plantation to compensate the felled down trees and enhance the ecological condition in the subproject area- preferably local fruits, flowers, medicinal and ornamental trees- Mango, Jackfruit, Jam, Kathbadam, Chalta, Krisnachura, Bokul, Jarul, Polash, Kadom, Shimul, Neem, Arjun, Amloki, Horitoki, Bohera, Mahogany, Palm Tree, Chambal, Rain Tree, Shil koroi, Satim, Sishu (including protection, fencing and conservation during project defect liability period): Preferably at both sides of Road where space is available (fencing as per LGED rate schedule 5.26.14) (Contractors will also be instructed by the consultant and PIU prior to the tree plantation work) at an interval of 10 feet.	300 nos.	@ Tk. 1000	300,000
9.	**Motivation training** Motivation training (twice: before and after construction start) of the Upazila Engineer 'sand Contractor's representatives on safety practice and as per direction of the E.I.C.	1 no.	LS @ Tk. 10,000	10,000
10.	**Waste disposal facility** Temporary camp site waste disposal facility improvement 2 nos. (1 no of organic waste and 1	LS	@ Tk. 5000	5,000

Sl no.	Description of item	Quantity	Unit price	Total amount
	no of inorganic waste disposal facility) and as per direction of E.I.C.			
11.	**Water Test (Drinking Water samples)** Water samples are to be collected periodically (half yearly) from the tube well at labor shed area for laboratory analysis of different parameters such as pH, arsenic, iron, chloride, hardness, total dissolved solids, nitrate, nitrite, coliform, electrical conductivity etc. all complete as per direction of E.I.C. (including the cost of actual fees for testing from reputed laboratory and report) as desired by E.I.C.	LS	@ Tk. 5000	5,000
12.	**Working labour shed:** Construction of Labor shed (Size: 30'x20') with C.I sheet Roofing, Tarza fencing and brick soling floor as per requirement and direction of the E-I-C.	1 no.	LS @ Tk. 30,000	30,000
13.	**Environmental management** Environmental management costs of the Environment & Social/ Safeguard Personnel for Environmental and Social Management and Monitoring during construction and operation phase for their salary & transport (Net payment excluding Tax &VAT). And as per direction of the E.I.C. **(One Safeguard Personnel for R3, R5, R7, R11 & R14)**	1 person	Monthly basis @Tk. 35,000.00 for 12 months. One person covering 5 roads i.e.35,000Tk.*12months*(1/5 one road).	84,000
	Subtotal Bill: Environmental facilities			**841,816.30**

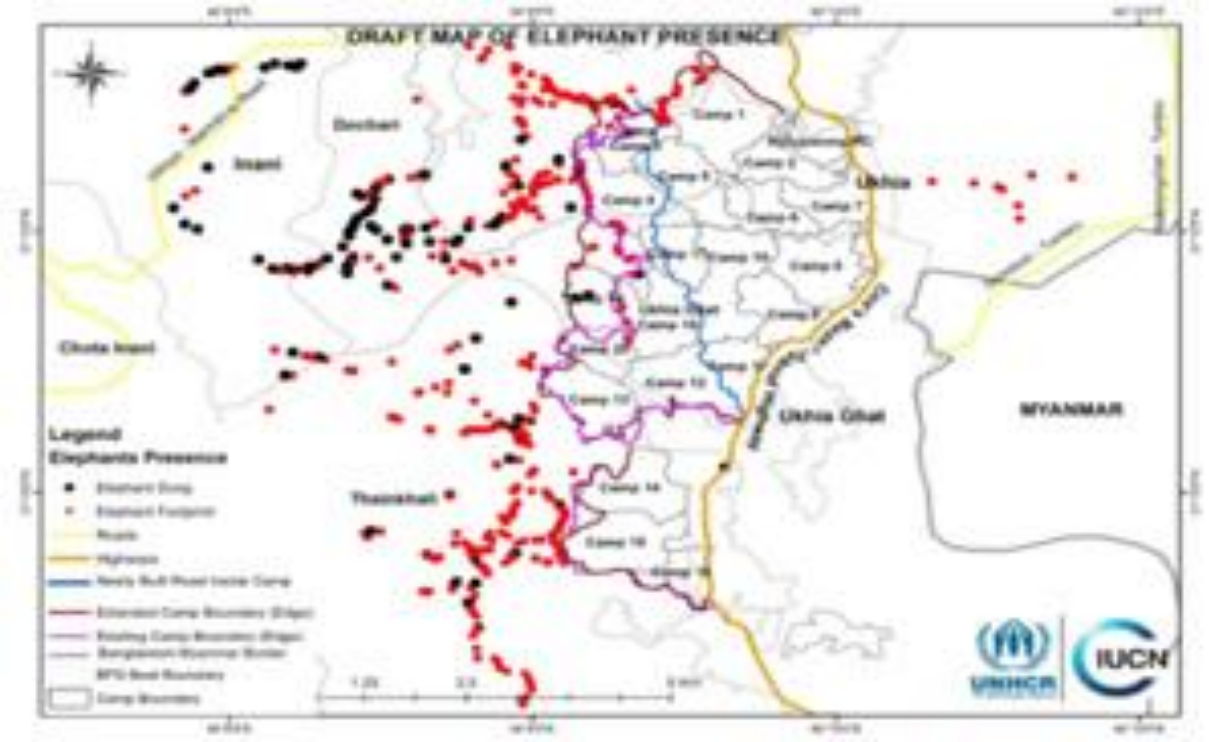
Cost of H&S Measures under COVID 19 Situations for W23-7

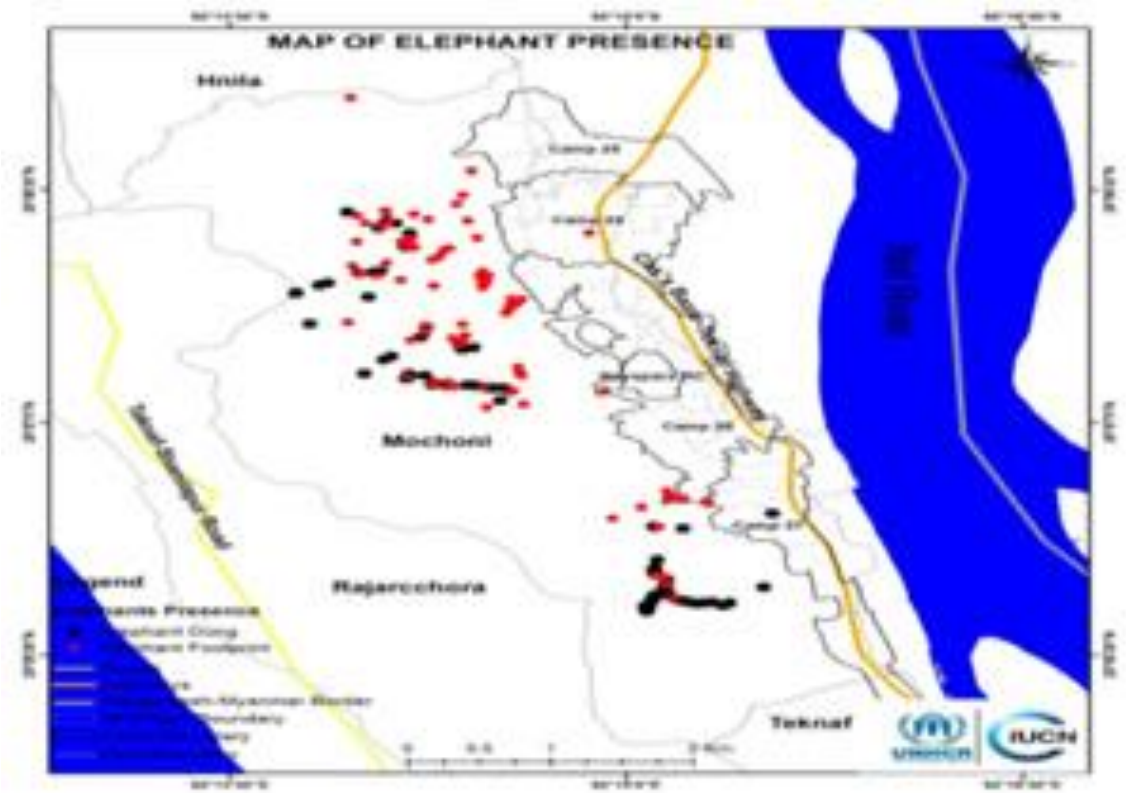
Considering the emerged situation, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites. The cost is estimated counting 30 workers for 270 active working days (9 months in a year) in a contract period for one site under this package (EMCRP/W-20.4).

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
1.	Non-Contact IR Digital Thermometer	01 nos. in each site	N/A	N/A	5,000.00	1	5,000.00	Each site office will have a thermometer for checking body temperature every morning at the entrance of the working site
2.	Wash Basin with Small Water Tank, Bucket and Mug (or piped water supply)	01 nos. in each site	N/A	01 nos. in each camp	10,000.00	2	20,000.00	Wash basin to be installed at favorable locations immediately after the entrance to the facility
3.	Trash bin (covered)/Paddle Bin	01 nos. in each site	N/A	01 nos. in each camp	550.00	2	1,100.00	
4.	Bar Soaps (150 gm each)	81		101	50.00	182	9,100.00	To be placed in a case/holder on the basin, for washing hands for max. 35 people a day and showering of 30 workers in each labor camp.
5.	Hand Sanitizer (2 nos. 250 ml bottle and 5 liter Can for Refill)	2 bottles and 1 Can for each site	N/A	N/A	4,000.00	1	4,000.00	2 bottles and a 5 litre can for each Site office
6.	Face Shield/ Protective Safety Goggles	16 nos. for each site		N/A	400.00	16	6,400.00	For labors who work in close contact, 16 in each site

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
7.	One time Mask (Disposable) for Contractors' Staffs	5 nos. each day in each site		N/A	12.00	1350	16,200.00	Reusing N95/KN95 mask will not be a manageable option in field scenario, one time disposable medical/surgery mask a good option instead.
8.	Cloth mask for Workers	N/A	30 nos. for each labor camp		35.00	540	18,900.00	A worker will use a mask for 15 days with everyday washing
9.	Floor Cleaner (1 litre Can)	1.5 Can	N/A	3 Can	250.00	4.5	1,125.00	
10.	Detergent Cleaner	N/A	1.5 kg in each camp/month		400.00	13.5	5,400.00	To be used for washing clothes, masks and tools & equipment, etc.
11.	Miscellaneous cost				20,000.00	1	20,000.00	Contingency cost for medical emergency and compensation for workers, subject to proper documentation
	Grand Total						**107,225.00**	

Appendix-4: Elephant Migration Routes Map





Elephant presence map (latest information published by on 24 May 2018)

Appendix-5: Location Map of this Sub-project component

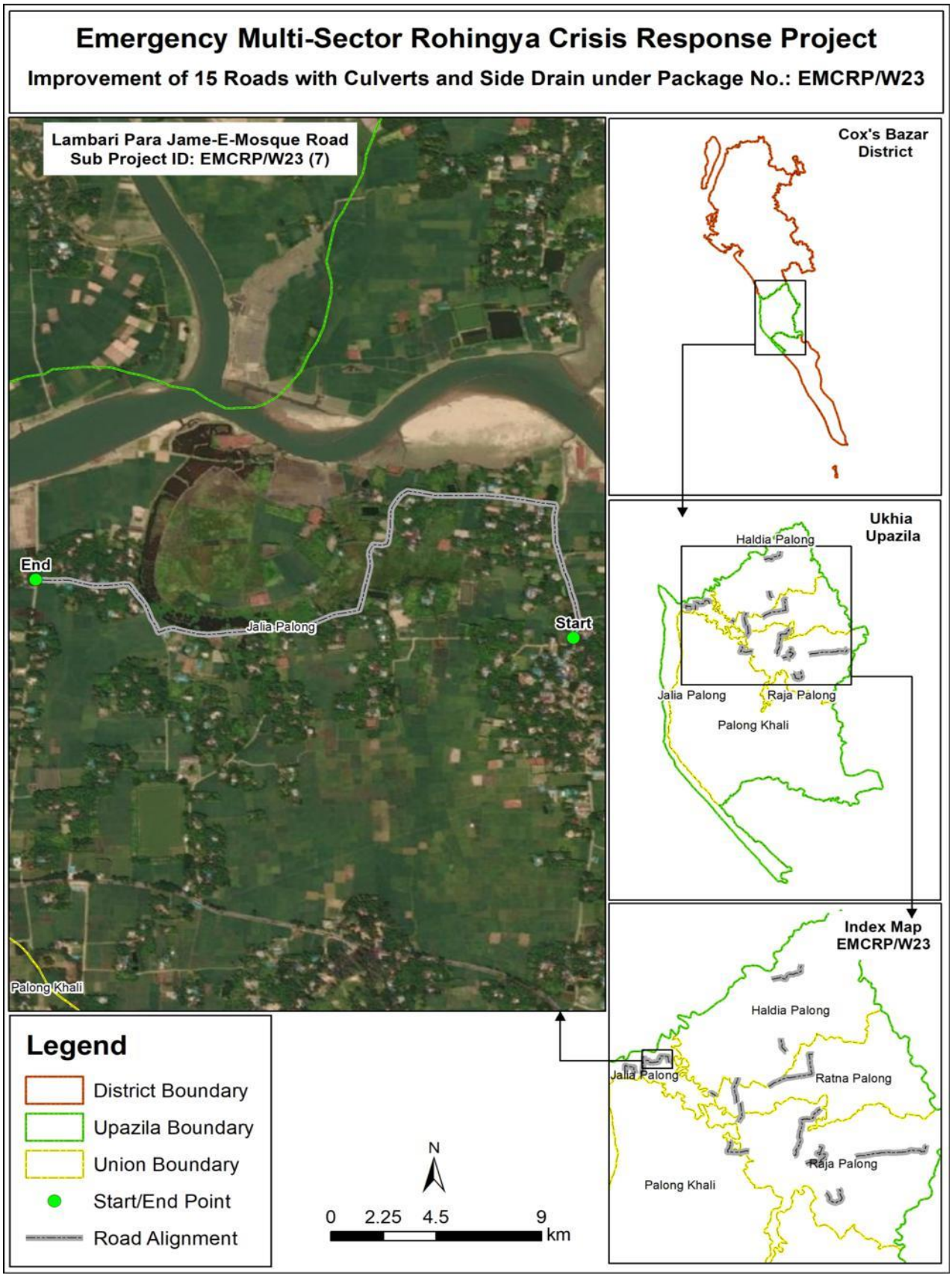
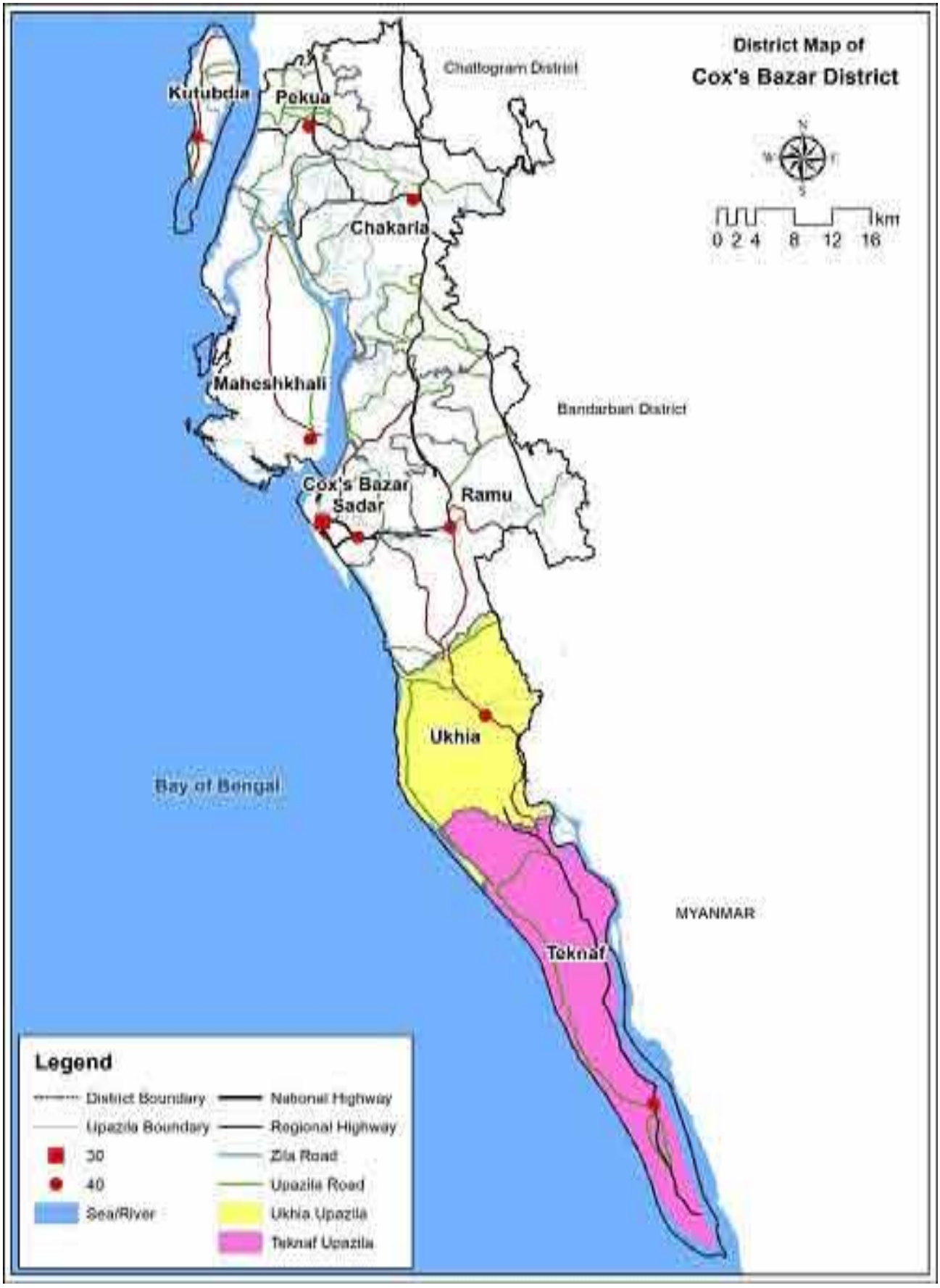
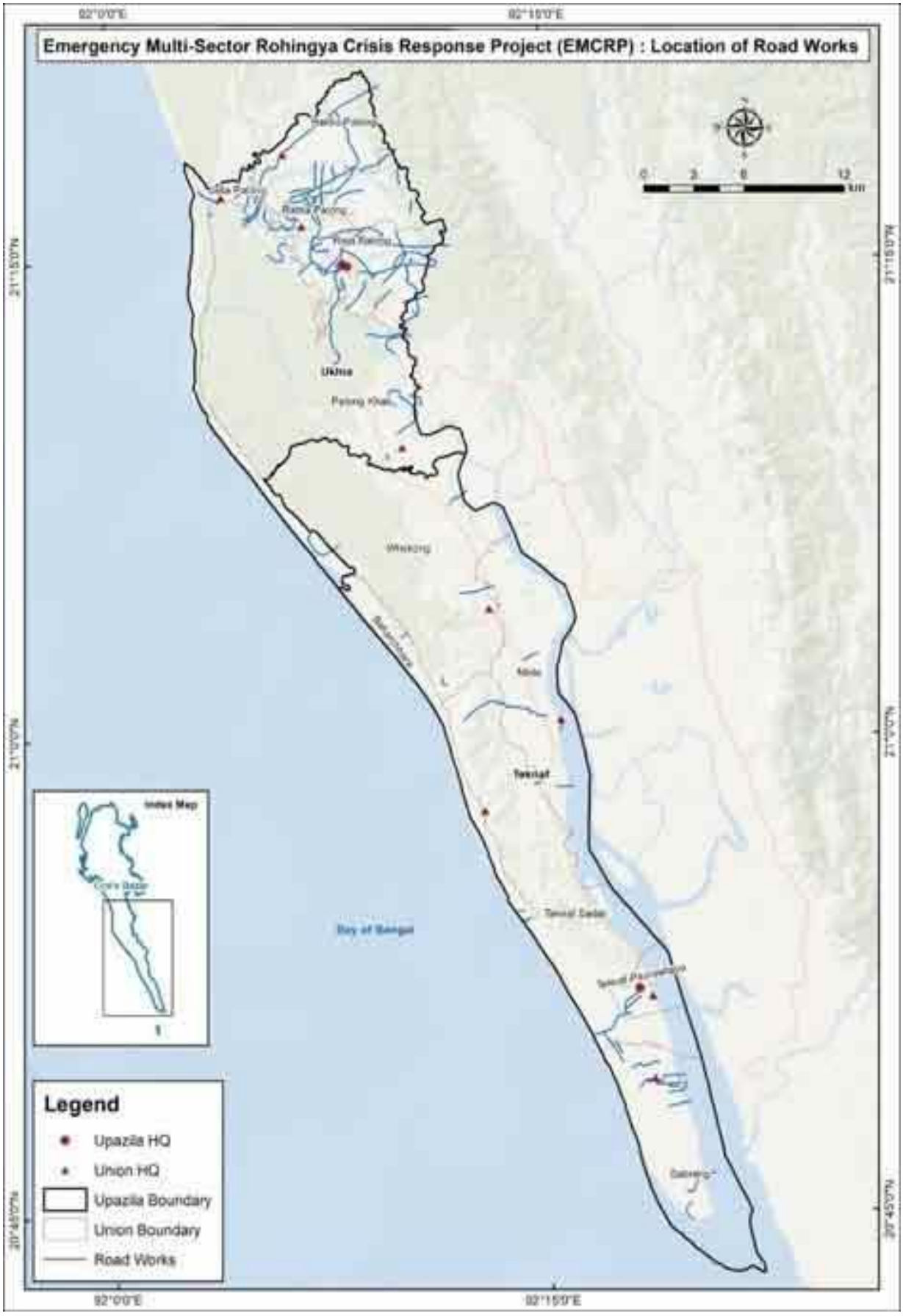


Figure: Location Map of W23-7



District map showing Ukhiya and Teknaf Upazila



Upazila map locating proposed roads

GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH
Ministry of Local Government, Rural Development and Co-operatives
Local Government Division
Local Government Engineering Department

Emergency Multi Sector Rohingya Crisis Response Project (EMCRP)

Project ID: P167762 **IDA Credit No. 5561-BD**





Environmental Screening Report

For Ghaltpara holudia Road with culverts and side drain under Cox's Bazar District.

Under the package no. EMCRP/W23

Funded by:

THE WORLD BANK
IBRD • IDA

Government of the People's Republic of Bangladesh & World Bank

Design and Supervision Consultancy:

ddc Development Design Consultants Ltd.

October-2020

Contents

1. INTRODUCTION 1
1.1 Project background 1
1.2 Elementary information of Work Package Components of W23.8 2
1.3 Proposed intervention items of sub-projects 5
2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS 5
2.1 Methodology 5
2.2 Important features/establishments within the PIA 6
3. ENVIRONMENTAL SCREENING 9
3.1 General 9
3.2 Major Findings 9
3.3 Climate Change Impact Screening 12
3.3.1 General Overview of the area 12
3.3.2 Site Specific Screening and outcome 13
4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) 14
4.1 General 14
4.2 Health and Safety Measure under COVID Situation 17
4.3 Cost of Environmental Enhancement Works in BOQ 18
5. LIMITATION OF THIS STUDY 18
6. CONCLUSION AND RECOMMENDATIONS 18
Annexure-01: Important Environmental Features (IEFs) near site: 20
Annexure-02: Attendance of consultation meeting 21
Annexure-03: Pictures of sub-project component location and surrounding features with public consultation 22
Appendix-1: Environmental Screening Form for examining sub-project component 23
Appendix-2: Environmental and Social Management Plan (ESMP) 41
Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.8 49
Appendix-4: Elephant Migration Routes Map 55
Appendix-5: Location Map of each Sub-project component 56

ACRONYMS

BOQ	Bill of Quantities
BFS	Brick Flat Soiling
D&SC	Design and Supervision Consultant
DoE	Department of Environment
DRP	Displaced Rohingya people
EA	Environmental Assessment
EC	Electrical Conductivity
EMCRP	Emergency Multi-Sector Rohingya Crisis Response Project
ESMP	Environmental and Social Management Plan
ERP	Emergency Response Plan
ESMF	Environmental and Social Management Framework
FDMN	Forcibly Displaced Myanmar National
FGD	Focus Group Discussion
FSM	Faecal Sludge Management
GBV	Gender Based violence
GPS	Government Primary School
GRM	Grievance Redress Mechanism
HBB	Herring Bone Bond
IEFs	Important Environmental Features
ISCG	Inter Sector Coordination Group
IUCN	International Union for Conservation of Nature
IWM	Institute of Water Modeling
LGED	Local Government Engineering Department
PIA	Project Influence Area
PIU	Project Implementation Unit
PMU	Project Management Unit
PPE	Personal Protective Equipment
PSC	Project Steering Committee
SMC	School Management Committee
SPM	Suspended Particulate Matter
SWM	Solid Waste Management
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
UNHCR	The United Nations High Commissioner for Refugees
VAT	Value-Added Tax
WB	World Band

1. INTRODUCTION

1.1 Project background

An estimated 730,000[1] people of Rohingya community has fled to neighboring Cox's Bazar district of Bangladesh since August 25, 2017 to escape extreme violence in Rakhine State of Myanmar, which caused the total number of Forcibly Displaced Myanmar National (FDMN) in the district to be about 923,033[2]. This huge number of displaced population account for about one-third of the total population of Cox's bazar, a district which was already facing many development challenges and suffering from resource-constrained social service delivery system even before the crisis evolved and the mass exodus of FDMN has worsened the situation further. Almost all of these displaced people are hosted in Ukhiya and Teknaf Upazila of Cox's Bazar, in extremely congested settlements in areas having very minimal access to basic infrastructure and services and is prone to natural disasters. The Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP) has been designed in order to reduce the vulnerability of Forcibly Displaced Myanmar National (FDMN) along with people from the host communities in Teknaf and Ukhiya Upazila under Cox's Bazar District, to different disasters and improve the social service delivery system and disaster resilience to both the communities. This project will follow a sustainable development pathway that is resilient to disaster and climate change effects.

The objective of the Project is to provide greater protection for the FDMN and host communities through:

- Reducing the vulnerability to natural disasters
- Improving social service delivery system and providing better communication facility through physical interventions
- Improving water and sanitation facilities
- Reducing vulnerability to accidental fire
- Provisioning better educational facilities and
- Strengthening and scaling up of GBV prevention services to the FDMN

The project is jointly being implemented by Local Government Engineering Department (LGED), Department of Public Health Engineering (DPHE) and Ministry of Disaster Management and Relief (MoDMR) under their respective mandate and scope of works. Apart from the interventions in Addressing Gender and Social Inclusiveness and Preventing Gender Based Violence with the Support from UNFPA and building Communication and Awareness among all affected parties through an effective engagement of BCCP (Bangladesh Center for Communication Programs) in the areas, LGED is implementing a good number of infrastructural facilities, namely improvement of hat bazars, roads (both inside and outside of the camps), bridges, culverts, construction of School cum multi-purpose disaster shelters, Satellite Fire Stations, Relief Distribution Center, Community Service Center and many other different types of facilities. Given the project interventions, sensitivity of the areas and volume of people in or around the sites, the project is more likely to trigger certain Operational Policies and Bank Procedures, namely Environmental Assessment (OP/BP 4.01), Natural Habitat (OP/BP 4.04), Forest (OP/BP 4.36) and Physical Cultural Resources (OP /BP 4.11).

[1] ISCG: Situation Report Rohingya Refugee Crisis, (September 27, 2018)
[2] IOM Needs and Population Monitoring round 12 as of October 10, 2018

1.2 Elementary information of Work Package Components of W23.8

It is imperative to recognize proposed components under Work Package-W23.8 in Ukhiya Upazila in order to assess and verify its interventions according to stipulated screening requisites from WB. Acknowledging this matter, such details are accounted for as given below in Table 1.2.1 along with visual presentation (General Upazila Map) given in Figure 1.2.1. Aerial maps for each sub-project is given in Appendix -5.

Table 1.2.1: Basic Featured Information of components [Sources of data: Field survey, 2020: DDC & LGED]

COMPONENT'S NAME UNDER W-23.8	GPS COORDINATES	DISTANCE FROM UPAZILA HQ	UNION	WARD	LOCATIONS UNDER PROJECT INFLUENCE AREA	PRE-EXISTING CONDITION OF ROAD	PROPOSED ROAD TYPE	ROAD DIMENSION(M) (LENGTH X WIDTH) = FOOTPRINT (SQ.M) *
GHALTPARA HOLUDIA ROAD ID:422945025	**Starting Point** $21^0$17'29.9" N $92^0$07'31.4" E **Ending Point** $21^0$17'55.5" N $92^0$07'29.9" E	10 Km	Haldiapalong	5	Ghatirpara, Nasirpara	BFS	Bituminous Carpeting (BC)	(975mX4.9m) = 4,777.5 sq. m

*Note: Roads are proposed to have average carriage way of 3.7m with 0.6m shoulder on each side; special conditions may prompt further adjustments while in construction period. However, footprint for roads are calculated with an average of 4.9 meters.

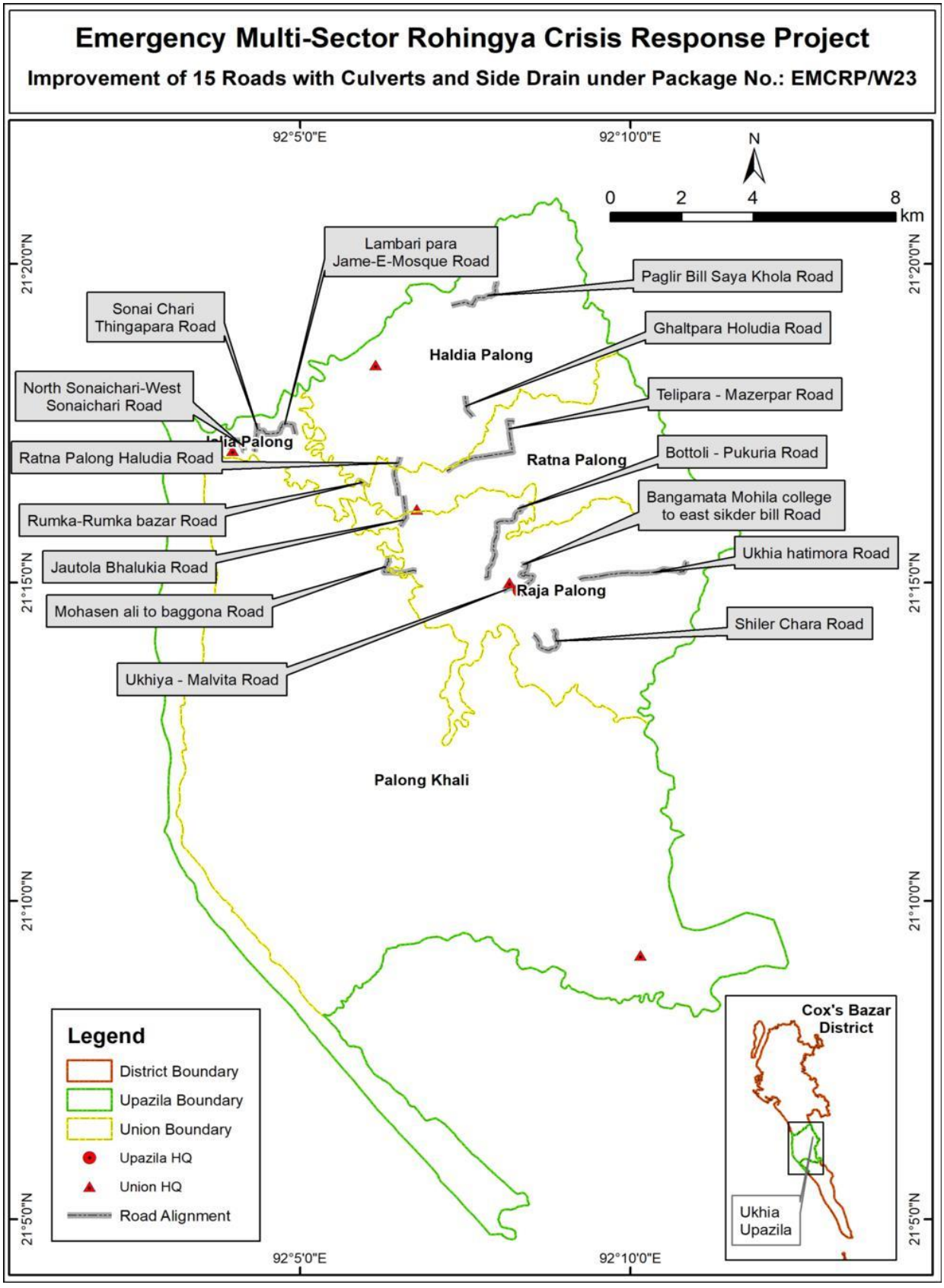


Figure 1.2.1: Map illustrating Roads of Work Package EMCRP/W23 locations in the Ukhiya Upazila

1.3 Proposed intervention items of sub-projects

The roads under work package W23.8 have been proposed with specific need basis dimensions to accommodate and ensure best quality interventions for local stakeholders. In context of governing environmental circumstances and geo-meteorological conditions, protection work items have been added to construction design for safety and sustainability of each proposed roads. These roads are abutting agriculture hence, construction and improvement works will descent these roads into new circumstances in some parts. These items have been included on the basis of field survey and analysis of these conditions. Please follow the table to acknowledge these items.

Table 1.3.1: Proposed safety interventions of each sub-project for W23.8

W23-8: Ghaltpara holudia Road Id:422945025
Construction of 04 nos. Cross Drain (dimension: 0.975mX 0.975m) at Ch. 128.0m, Ch. 372.0m, Ch. 552.0m & Ch. 636.0m of chainage and construction of **01 no. Box Culvert** (dimension: 3.0mX2.0m) at Ch. 761.0m, construction of **545.0m L-drain** at different Chainage, Construction of **Earth** works, **Road safety** works and **Environmental Mitigation and Enhancement** works. Description of Environmental Mitigation and Enhancement works can be found in BOQ attached in Appendix-03.

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS

2.1 Methodology

Public participation and community consultation have been taken up as an integral part of environmental assessment process of the project. As part of the impact assessment, participatory public consultation was conducted in areas of concern for proposed road by the field level staffs and consultants from PIU and D&SC. The consultation meeting was attended by disparate social groups representing local habitants, separate age groups, social class and occupations. In some cases, IUCN employees in charge of elephant watch tower were present where frequent elephant movements occur. The participants were also selected from different segments of stakeholders, and some of whom will have major active roles before, during and even after the construction works. Therefore, the meeting was organized in an informed, expressive and unbiased manner, wherefrom different views and concerns came across which will be properly taken care of during the design and construction phases. In order to serve our screening process, relevant items were thrown towards the audience to discuss and troubleshoot confusing or worrying matters regarding the proposed intervention under package work. Impacts in regards to environment, socio-economic matters during pre-construction, construction and post construction phase has been put forth. Possible mitigation measures and relevant needs have turned out during these sessions as well. Moreover, their comprehension as a stakeholder has been up lifted in light of project guidelines.

However, public consultation is a living process as the types of problems/ difficulties, involved parties or stakeholders and mode of settlement or resolution processes are more likely to differ with time. Thus, consultation with different parties or stakeholders will be continued throughout the sub-project implementation period and records of resolutions, whatsoever and wherever possible, will

be kept in writing at the site and made available on any enquiries or requests by all parties concerned.

All components under the work package have been put through review for locating impediments or possible adversity effecting future environment and socio-economic conditions. In order to comprehend surrounding features and impacts which may stipulate with it, screening has acknowledged having a Project Influence Area (PIA) of 0.5-kilometer radius. Sensitive findings have been identified if any, and relevant mitigation or minimization measures were suggested to subdue such complication for over the project construciton period. Moreover, evaluation was inspired to enhance environmental features and include monitoring initiatives under ESMP budget to ensure exertion of environmental improvement propositions. Contractor's responsibility has been taken into account while identifying possible impacts through sets of intervention accounts. These steps have been initiated strictly following ESMF guidelines and requirements. Environmental screening procedure was motivated by ingredients highlighted in Appendix-2 of ESMF. During survey, detail chainage length of the sub-projects was taken into account for detailing environmental and socio-cultural features within 100 meters buffer zone of both Left and Right side from the center line of the road. Longitudinal intervals of 300 meters have helped to identify positions of sensitive or near-sensitive socio-cutural features. These findings are illustrated in **Annexure-01**.

2.2 Important features/establishments within the PIA

Initial screening process is conducted through direct involvement of PIU and D&SC in the influence area of the proposed component, which allows to raise significant questions and ideas towards participants. In combination of both field walk-through and inputs of audience, a register of existing features is formed. Allow the following table to describe such elements in all the work package components.

Table 2.2.1: Important features within Project Influence Area for W23.8

Component's name under W-23.8	Direction	Important features/ establishment (approx. distance from the proposed site)
Ghaltpara holudia Road Id:422945025	North	Nasirpara mosque & graveyard (100m), Middle Holudia mosque (100m), Haludia khal (500m)
	South	Hatirghona Baitus-sarof jame mosque (600m)
	East	Middle Haludia GPS (100m), Patan Fokir jame mosque (50m), Ghatipara community clinic (10m), Ghatipara station (400m), Nobin Mohajon Buddhist Bihar & cremation (1km), South Holudia GPS (700m), South Haludia Bazar (500m), Dargahmora jame mosque & graveyard (400m), Shirdeba jame mosque (600m)
	West	Nasirpara jame mosque (400m), Nasirpara station jame mosque (300m), Nasirpara station (200m), Ghatipara Khalek market (5m), Moulavipara Ebtadia Madrasah (200m), Soliccha Chorra (700m)

2.3 Issues and Recommendations raised by the Participants in regards to component interventions

After inauguration has set in motion, their valuable opinions and remarks came pouring out. At this point, we find our field base knowledge for assessment attributed impact degrees and possibilities. Please follow the table 2.3.1 given below to recognize participants' inputs arranged in relevance with this component. Consultation meeting summary, attendance sheets and pictures of separate meetings with proposed location for this sub-project component can be found in Table 2.3.2 and Annexure-02 and Annexure-03 respectively.

Table 2.3.1: Issues and Recommendations raised by the Participants

COMPONENT'S NAME UNDER W-23.8	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
	• In Ghatipara and Nasirpara Villages area, this proposed road is previously HBB developed. However, they feel this improvement initiative is highly needed for them to ensure quality road for better communication facility. • Big vehicles cannot use this road such as delivery trucks or buses •Possible dust and noise pollution during the construction works. •Safety of children and adults at the sites during construction	• Local people considered that the selected site is suitable for the construction of this road from both the technical and social-environmental (direct savings in the cost of operating vehicles, time savings by travelers and freight, wider effects can less accident rates, road being waterproof and dust free, much more durable) point of view. It will provide better mobility and access to services in due time. •The road should consider water flow during rainy seasons thereby ensuring the construction is not affected by mass water flow. •Enough pathway is expected for vehicle movement so that comfort travel is achieved. •Construction site safety should be ensured to avoid any mishaps or accidents during work periods.

COMPONENT'S NAME UNDER W-23.8	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
GHALTPARA HOLUDIA ROAD ID:422945025	works. •Elephant movement not present. •Local community wish to have a better drainage system along with the road in order to allow waters from undulated terrains to find an uninterrupted pathway not causing harm to nearby households or agriculture fields and wash away top soil of adjacent grounds residing alongside the road. It will protect the top soil for future growth of crops and aid vegetable farming. •The participants have expressed their greater interest for this intervention and believes this will bring nothing but prosperity for the entire catchment dwellers. •Household fences along the road should be affected while construction • No trees should be harmed for preparation of this road • Available pathway to usher material delivering vehicles • Labor shed availability in the target location • Material storage is available • Electricity is available	•They considered small lumbering and suggested tree plantation initiatives. •They also requested to involve the local community to construction work and they will welcome any outside key labor. •During construction period, alternate route to pass through this area is available. •Since the road is passing alongside homestead gardens and agriculture fields, the intervention will invite air pollution on moderate level during construction period. However, preventive actions and measures can be taken to keep air quality from degrading. • Women should be recruited equally, wherever possible. •Participants, made certain that they will provide surveillance over raw materials and material storage area. •They have also ascertained that the selected site is free from any events related to resettlement and major environmental impacts. The adverse environmental impacts that may come in the way of air quality, noise, solid waste, occupational health & safety during the construction period, and will be of short duration, yet proper management/conservative options should be adopted. •An open space is available of Abdul Kader Gong. & DC Mir Ahmed at Ghatipara which can be rented for material storage and labor camp. •A connecting road called Sabek Rumkha connecting road which connects with proposed road is available for material delivery on site.

Table 2.3.2: Consultation Meetings Summary

Road Package Number	Date DD-MM-YYYY	Venue	Main Participant Groups	No. of Participants	Remarks (If any)
W23-8	07-10-2020	Ghatipara Khalek Market	Host Community	10	The local individuals, elites, chairman and/or member of respective Union Parishad, representatives from different agencies participated in those consultation events.

3. ENVIRONMENTAL SCREENING

3.1 General

This section identifies the potential impacts that the various elements of the proposed Project may have on the physical, biological and socio-economic environment within half a kilometer of the radial distance around the site. Environmental Assessment (EA) based on this screening study for the Sub-project has been conducted to identify and determine which potential Project impacts may be significant and therefore require the application of reasonable and effective management and/or mitigation measures.

In order to realize the exact physical, biological, socio-economic and environmental impacts of the proposed sub-project sites and the influence area in regards to the implementation measures, an extensive field visit was carried out in each proposed sub-project PIA. Environmental Screening form, as adopted in **Appendix 2** of the Environmental and Social Management Framework of EMCRP, was administered for identifying the impacts and their extents.

The screening data and information for this sub-project component and details screening summary have been formulated and shown in **Appendix-01.**

3.2 Major Findings

A complete view of current environmental conditions of individual sub-projects in relation to interested queries has been congregated in order to understand the degree of impacts corresponding with marked interventions. Interestingly, most sub-project has correspondence with its surrounding features and upholds interchangeable impacts. However, the degree is not an interchangeable factor since scale is not parallel to each of these components which is where, mitigation measure differentiation is implied. There are some cases where unique circumstances have been met with while environmental screening took place which is also accounted for and should be a matter of concern for other parts of the ESMF initiative. The significant issues observed for this sub-project component is enlisted in following Table 3.2.1 with pertaining impacts. Moreover, impacts that are adventitious has also been embraced for promoting best practices.

Table 3.2.1: Concerning environmental issues relating to each proposed subproject and influence area.

COMPONENT'S NAME UNDER W-23.8	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
GHALTPARA HOLUDIA ROAD ID:422945025	It is not located within any major environmentally sensitive area.	It will not cause any severe negative effects to the environmental settings of the area neither to important environmental features.
	Construction period will induce air pollution while preparing for bitumen and loading-unloading raw materials. Impacts on air quality during the construction phase may turn to negative. The main impacts include dust generation from crushers, vehicles and the transportation of all types of construction materials.	It will invite waste production which may in turn cause minor air pollution due to deposited dust and airborne particles less than PM_{10}. Dust pollution may slightly suffocate photosynthesis however this can be minimized through regular water sprinkling as suggested in ESMP.
	Noise emission from construction machineries and equipment can cause nuisance to local residents and workers.	The ambient noise level might have potential to increase temporarily and intermittently in the close vicinity of active construction fronts.
	No protective works, fish farming and significant vegetation coverage is located in the ROW nor does it stand over such items. Nonetheless agriculture fields, high land (tila), earthen settlements and homestead gardens are found beside the road.	No agriculture land or any forest coverage will get degraded or lost for construction. Liquid waste such as left-over oils or chemicals might run into these adjacent features.
	Construction works will involve chemical usage and preparation of on-site add-ons to the road. Generating scraps and residues.	The runoff from work site may enter existing water body and frustrate the water quality which will be acute however.
	Few amounts of bush (sapling) clearings may need cutting at different chainage.	No severe damage will occur or damage to habitat will be faced. It can be managed by introducing small plantation incentives around the proposed location.
	Elephant Movement is not present	No impact
	No heavy earth excavation work will be involved.	Consequently air, noise and dust pollution will be occurred within a small-scale during construction period only.
	Construction related activities and setting up of labor camps along with associated facilities and their management can cause adverse impacts.	Noise pollution from pilling or drilling, air pollution caused by dust or gaseous emissions from vehicle movement, running of motorized equipment and land clearing, odors and soil pollution from leaking of latrines and fecal sludge, will more likely to take place.
	Chemical spills or improper disposal of construction waste materials due to lack of worker training and misconduct of contractor's safety initiatives.	During the construction period, soil may get contaminated from activities such as handling of hazardous construction materials (such as fuel,

COMPONENT'S NAME UNDER W-23.8	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
		lubricants, paints, and solid waste and sewage).
	Vibration effects generated from mixing, grinding, pilling, drilling or other construction works	Any vibration would result in nuisance effects to nearby faunal species, and but will be localized and temporary and will unlikely to result in structural damages to buildings or walls of the adjacent private properties.
	Sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site are at north side Nasirpara mosque & graveyard (100m), Middle Holudia mosque (100m), Haludia khal (500m), at south side Hatirghona Baitus-sarof jame mosque (600m), at east side Middle Haludia GPS (100m), Patan Fokir jame mosque (50m), Ghatipara community clinic (10m), Ghatipara station (400m), Nobin Mohajon Buddhist Bihar & cremation (1km), South Holudia GPS (700m), South Haludia Bazar (500m), Dargahmora jame mosque & graveyard (400m), Shirdeba jame mosque (600m) and west side Nasirpara jame mosque (400m), Nasirpara station jame mosque (300m), Nasirpara station (200m), Ghatipara Khalek market (5m), Moulavipara Ebtadia Madrasah (200m), Soliccha Chorra (700m).	No disturbance to all these establishments/features is anticipated due to construction activities for the sufficient distance from the construction site, and strict construction site management system- including restrictive work schedule during the daytime only, water-sprinkling twice a day on and around the site, safe storage of materials, etc.

A few incidents of human elephant conflict have been reported in 2018. The IUCN has conducted a study on such conflict. With the support from UNHCR, IUCN has been marking elephant routs and corridors and informing local communities and stakeholders of avoiding the marked areas. As part of the mitigation options, different initiatives have been undertaken, such as formation and capacity development of Elephant Response Teams (ERTs); providing equipment to ERTs to divert in-coming elephants; and setting up elephant deterrent tools (e.g. trip alarms and watch-towers). Though the current chances of occurrence of conflicting incidence are zero, any recurrence would be managed by the ERTs and they will be called if there appears any minute possibility to recur. A map of elephant movement is given in Annexure 04.

In order to offset the loss or attenuating the environmental degradation, a set of mitigation measures will be adopted, on top of general practice of standard construction procedure or following the relevant codes of practices.

3.3 Climate Change Impact Screening

3.3.1 General Overview of the area

Cox's Bazar is one of the coastal districts of Bangladesh and is prone to the effects of climate change due to its geomorphological siting and climate induced effects. The hilly tracts of Cox's Bazar could foster further environmental crisis brought on by indiscriminate deforestation and diminishing groundwater reservoirs, which have been taken place in recent months as the Rohingya crisis evolved. A recent study conducted by World Bank[3] has found that Cox's Bazar will be the worst-hit district in South Asia as average temperatures rise and rainfall patterns become disruptive, by 2050, if greenhouse gas emissions continue unabated.

The hilly region of the country, especially the part in Cox's Bazar is characteristically of muddy soil structure, not of any rocky formation and the stability comes from the roots of the trees. Also rainfall, proximity to the sea, elevation, and land cover are very important factors for analyzing the risk of cyclone. Denudation of trees from hilltops in order for the huge settlement of Rohingya people has already increased the vulnerability to the risk of hill collapse by destabilizing the terrain. Also deforestation at a rapid speed uncovers the land and raise the risk of occurrence of cyclones, as forests protect land from high wind and storm surges where demolishing the trees would make the area vulnerable.

Together with the above-mentioned hazardous situation, again due to sudden extraction of huge amount of groundwater, availability of potable water from shallow tube wells that pump water up from about 150 feet has already reached to a critical level. Averting the problem requires new tube wells to be plumbing deeper into the poorly mapped aquifer, but going deeper than 700 feet in some places may cause salt water to contaminate freshwater resources.

In this case, it is possible that a stationary position of the freshwater-saltwater transition zone can be established via proper management of pumping in the confined aquifer.

The groundwater resource is seen to suffer more from the climate change impact. The impact on groundwater due to climate change impact include

- Sea-level rise could result in a transgression of the sea and a loss of land area. This could also lead to the secondary effect of population migration in the new coastal band due to migration of the coastal population from the encroaching sea, thereby increasing domestic water needs in the new coastal area.

- Transgression of the coast implies that saline storm surges of 1 or more meters depth would penetrate beyond the new coast to new land areas. Storm surges transport saline water far inland of the coast and much of this floodwater may infiltrate the ground in areas where the aquifer is not fully saturated. Even where the aquifer is saturated, denser saline water may

[3] https://openknowledge.worldbank.org/bitstream/handle/10986/28723/9781464811555.pdf

sink into the aquifer during the flood and later from pools of saltwater that remain following the flood[4].

- It has been identified that the salinity is found in the shallow aquifers along the coastline. So the salinity which are found in the groundwater are of lesser concern as salinity will subside over time

- Several researches show that through modeling of groundwater flow that the depletion of groundwater in the host community will persist up until 2022 and the replenishment of water will take place.

Considering the general climate change effects in Cox's Bazar area and offsetting the aggravating environmental situation due to the mass arrival of Rohingya communities, several specific measures including tree planation in sub-project areas, rainwater harvesting from every disaster shelter, construction of drainage facilities along the road length and installing thunder arrester across the areas, have been suggested and will be implemented.

3.3.2 Site Specific Screening and outcome

Climate Change impact on a particular subproject is tough to deduce as the highest resolution of climate model simulation done over Bangladesh is 50km. Depending on the simulation ensemble of Cox's Bazar district, the temperature and precipitation are likely to increase with time.

Site specific climate change impacts are often not so easy to measure or deduce plausibly while the site is confined to a narrow strip of roadways, and associated mitigation or offsetting measures are really hard to plot on the impact areas, though an overall set of measures are often considered in practical aspect. Fig:1 shows the inundation risk map of the subprojects under W-23, none of the subprojects are in vicinity of the severe river flood inundation area. So the risk of flooding is low around the sub-project area

[4] "Implications of Climate Change for Fresh Groundwater Resources in Coastal Aquifers in Bangladesh", World Bank report.2010

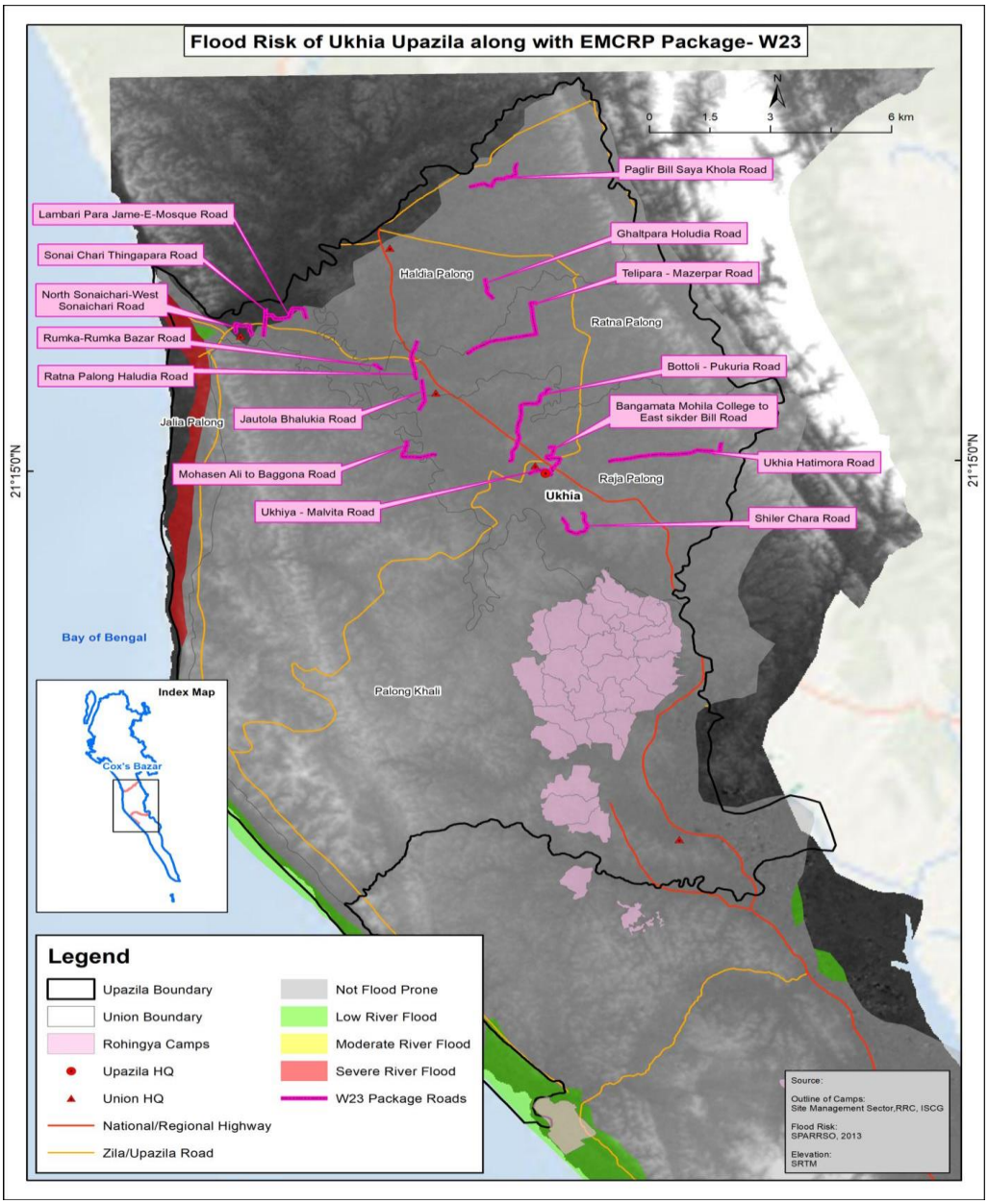


Figure 3.3.2.1: Flood inundation risk map near the subprojects.

Also, in order to avoid the devastation caused by the thunderstorm, state-of the-art thunder arrester (lightning protection system) has been suggested to install having a coverage area of 25,434 sq.m for a single arrester. In addition, tree planation on the road slope/ within the premises is also suggested to sooth the temperature effect and increase the water retaining capacity of soil, at the same time.

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

4.1 General

Considering the environmental settings of the sub-project area, it can be assumed that possible impacts would be largely construction-related, and could be addressed through adoption of good engineering practices; good housekeeping; better *in-situ* construction materials management; and observance of health and safety protocols during the implementation period.

Table 4.1.1: Site Specific Impact and Mitigation Plan under package W23.8

Component's name under W-23.8	Impacts	Mitigation plan
Ghaltpara holudia Road Id:422945025	Patan Fokir jame mosque (50m), Ghatipara community clinic (10m) to the east, and Ghatipara Khalek market (5m) to the west. Further, some settlements located adjacent to the sub-project area might get affected during the construction period with the generated debris and dust, though for the time being.	Contractor must adhere to the best practice debris management procedure and regular adoption of dust control measures (spraying of water at least twice a day) to minimize the effect to the level best.
	Proposed subproject area arises water logging problem during the monsoon sometimes. On the other hand, some part of the proposed road is passing by the agricultural land. Box culvert and cross drain will be constructed to terminate rainwater for one side to another side during rainy season and also help for rapidly remove excess soil water to reduce or eliminate waterlogging during monsoon and return soils to their natural field capacity and will help to maintain the water balance of both roadside agricultural land to provide a sustainable irrigated agricultural system. It will also help to prevent flood and not to allow water to overflow and also help to divert water for farming. Some high land is found beside the road. So L-Drain will be constructed for drainage high land eel water during rainy season.	Proposed safety structures are **04 nos. Cross Drain** (dimension: 0.975mX 0.975m) at different chainage and **01 no. Box Culvert** (dimension: 3.0mX2.0m) at Ch. 761.0m, **545.0m L-drain** at different Chainage, **Earth** works, **Road safety** works and **Environmental Mitigation and Enhancement** works.

Further construction related activities which may result in adverse impacts in the surrounding environment of the sub project component must be kept under close consideration and appropriate mitigation and management measures will be taken with due care and vigilance. Once the effects are minimized to its least level and controlled efficiently, it will turn into a welcoming and beneficial project for the local communities. The specific environmental management plans have been outlined in **Appendix-2**. The mitigation measures as well as monitoring program of ESMP have also been incorporated in the management plan.

Environmental quality enhancement: Under the additional financing to the EMCRP project, Forest Department of the Government of Bangladesh will afforest along 200 km of road length area, primarily under the Ukhiya and Teknaf Upazila of Cox's Bazar district in order to offset the environmental and ecological devastation, that had been occurred due to the evolution of Rohingya Crisis, to an achievable level. Many of these road lengths will go through

and by the Rohingya Camps, up on the hill and are already denuded of trees or vegetation. Local Government Engineering Department (LGED) will allocate and channelize the finance to the Forest Department under the said additional financing component and oversee the progress of works with due diligence. However, this enhancement work will improve the environmental quality of the area and reinstate some parts of the ecosystem services to those areas, though primarily.

4.2 Health and Safety Measure under COVID Situation

Apart from the established Occupational Health and Safety (OHS) measures being followed in construction sites, offices, and labor camps, a set of additional measures has to be taken and practiced throughout the daily cycle by each labor, staff and any involved parties, due to the ongoing pandemic coronavirus situation. Staffs and consultants at PIU and D&S, along with the pool of consultants under different firms/agencies for different services, and all the representatives or staffs of construction contractors and suppliers have to play much sensitive, (pro-) active and responsible roles in abiding by the rules and measures by themselves and getting the involved workers and different stakeholders adhered to the same. A detailed guideline containing a set of measures with shared responsibilities has been sketched out in order to fight the exposure and further spread of this potentially fatal situation. This plan or guideline shall constitute an integral part of ESMP measures for every sub-project, though is not included in this report to keep it concise and specific, and the contractor is required to keep the copy of that guideline at every site office.

However, among many other relevant issues, the guidelines emphasize on following line of directives:

a. Contractor must designate one of his employees as H&S/Safeguards supervisor to lead, coordinate and interface in order to fight the COVID 19 situation under the direct guidance of COVID focal at PIU of EMCRP project.
b. All workers, supervising and supporting engineers and staffs, consultants, service providers and other concerned parties must adhere to the personal health and hygiene rules, social distancing, and other protective measures in full in order to protect themselves and contain the infections any further. Necessary training and awareness campaign will be aligned with the specific sub-project scenario and prevailing conditions.
c. General practice of cleaning and hygiene has to be maintained in all project/site offices and camp sites, and supply of necessary PPEs and cleaning /disinfecting materials along with proper use of those is to be ensured.
d. Public consultation and stakeholder engagement are to be carried out considering the prevailing risks of virus transmission in the target areas, scope of interventions and level of ICT penetrations among the target stakeholders, and so on.
e. Necessary protocols have to be established and maintained in case of handling a sick employee or worker, and appropriate compensation to a sick disengaged labor is required to be given with due documentation.
f. Budgeting for suggested protective measures, along with necessary supervision and monitoring for the required interventions has to be ensured.

Following the additional health and safety measures presented in that guideline, sub-project component specific BOQ items have been inserted to supplement the budget considering the country-specific situation, capacities, and scope of interventions. The additional cost to Health and Safety Measures under COVID 19 situation is shown in **Appendix-3.**

4.3 Cost of Environmental Enhancement Works in BOQ

In consideration to the above-mentioned environmental impacts and their mitigation measures for this sub-project component, a set of items are included in the BOQ of this sub-project component. Social Safeguard Personnel for Environmental and Social Management for Work Package EMCRP/W23 has also been added in the whole BOQ in order to take supervision and leadership to organize Environmental Management under Environmental Enhancement Works. The total costing and estimation have included enhancements such as Grass turfing plans, Tree plantation initiatives, Dust Suppression mechanisms. On the other hand, in order to ensure health safety and sanitary measures of workers PPE, First Aid Box, Labor shed, Environmental management, drinking water facility with water tests, Temporary latrine for both male and female as well as waste disposal systems has been accounted for. Ensuring sustainable labor performance in regards to environmental and social considerations motivational training has been taken into account. An overview of the estimation is given below and the detailed estimated cost to implement the ESMP is shown in **Appendix-3**.

5. LIMITATION OF THIS STUDY

Bangladesh government has imposed a nationwide lockdown to curb the spread of the novel coronavirus in the wake of series of deaths and infections. Authorities declared a ban on passenger travel on all sector from March 24 while all public transport on roads have been suspended from March 26 to stem the spread of virus, officially known as COVID-19. All office works have been postponed and an intended visit to the sites for further consultation with the relevant stakeholders has had to cancel due to this crisis. Therefore, some relevant information and arrangement needs awaiting for recovering this pandemic crisis.

6. CONCLUSION AND RECOMMENDATIONS

The overall conclusion is that if the mitigation, compensation and enhancement measures are implemented in full, there will be no significant negative environmental impacts in regards to the selection of location, design, construction, and/or operation procedure of the proposed Sub-project. There will in fact be tremendous benefits from recommended mitigation and enhancement measures and major improvements in quality of life, opportunities in business, trading jobs and ensuring social safety and security will be achieved once the scheme is in operation.

The conclusions of the Screening study can be summarized as follows:

- The communities will receive large benefits through improved infrastructural facilities, transportation & communication etc.
- The short-term negative impacts that may come by the way of air quality, noise, solid waste, occupational health & safety need to be minimized through the management plan.
- The project will create employment for those who live in the vicinity of the construction site and will provide them a short-term economic gain.
- The green belt development, if necessary, for the road site, with large-growing trees at the periphery of the site will give the places a more natural and pleasing appearance.
- A comprehensive Environmental and Social Management Plan (ESMP) has been prepared to mitigate and reduce the adverse impacts that will come out from the Subproject activities.

Implementation of this Sub-project will have large positive impacts to the communities in terms of improved infrastructural transportation & communication facilities, which would eventually develop the socio-economic condition of the catchment areas. So, strong recommendation should be put in place to implement the sub-project within shortest possible period of time, and with great care and efficiency.

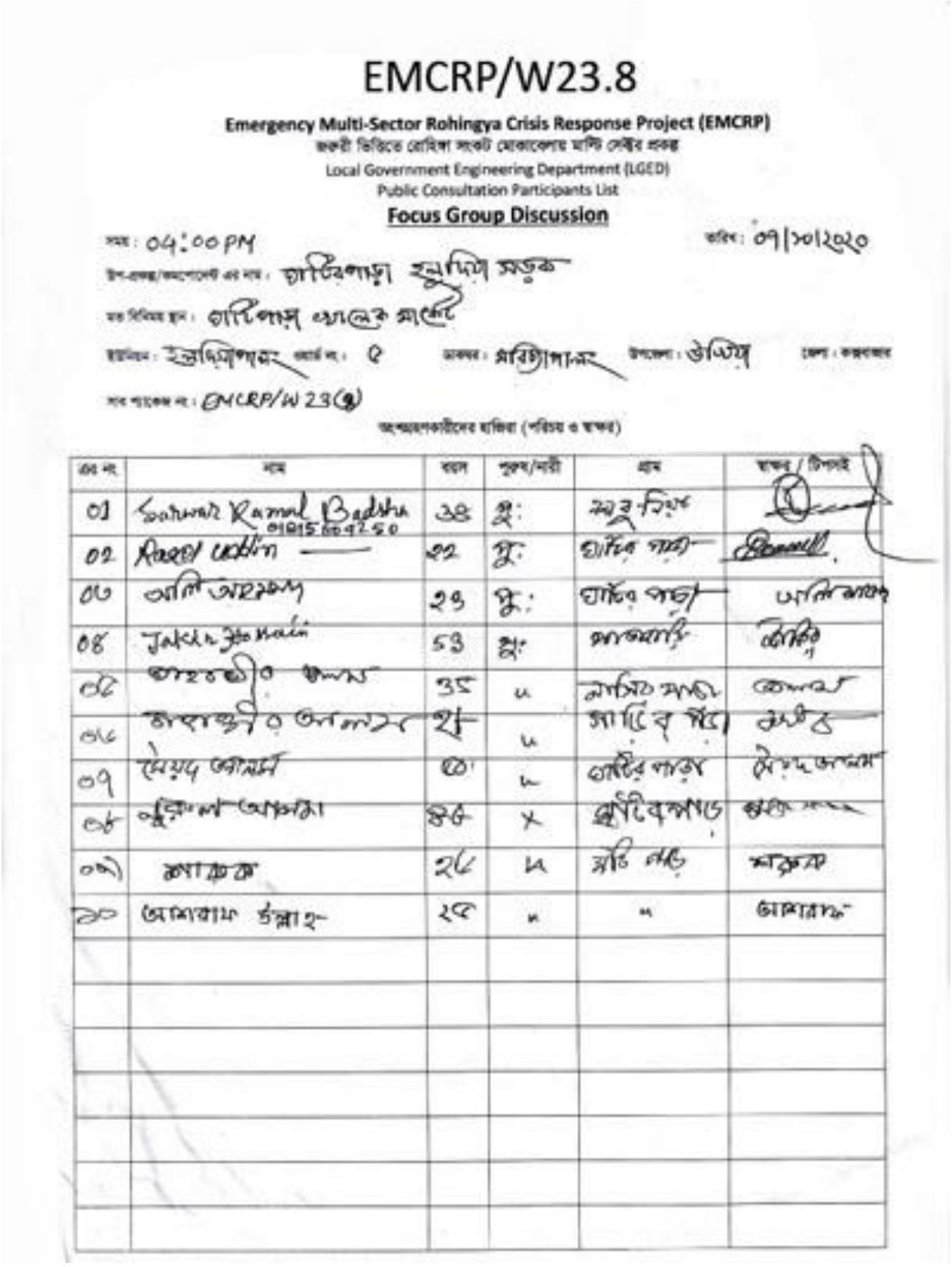
Annexure-01: Important Environmental Features (IEFs) near site:

Detail Environmental features within 100m of the both sides from the center line were collected @300m longitudinal intervals. The findings of the survey for the aforementioned road can be seen in the table below:

Table: Detailed Chainage length and feature of the Sub-Project component

Road Name	Ghaltpara holudia Road Id:422945025 **(W23-8)**		**Total Chainage**	975.0m
Chainage (m)	**Left**	**Right**	**Features**	
000-300	L		Trees high land, bamboo fencing, mosque, paddy land, culvert	
		R	Paddy land, mango trees garden, bamboo fencing, pond, bamboo bushes, bushes on high land	
300-600	L		Market, Tubewell, paddy land, guide wall, culvert, bamboo fencing, tin shed household, earthen household on high land, bushes on tila, building under construction, bamboo fencing, tin shed earthen household, household connecting road, RCC pole with wire fencing	
		R	Open space, bushes on high land, trees, tin shed household, net fencing, bamboo fencing, high land (tila), tin shed household, paddy land, RCC pole with wire fencing, Akashi trees garden on high land	
600-975	L		Wire fencing, bamboo bushes, bamboo fencing, paddy land, trees, bridge, household connecting road, paddy land, electric pole	
		R	Wire fencing, tin shed household, bamboo fencing, banana trees garden, bamboo fencing, wire fencing, pond, community clinic, local drain, paddy land	

Annexure-02: Attendance of consultation meeting



EMCRP/W23.8

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)

Local Government Engineering Department (LGED)

Public Consultation Participants List

Focus Group Discussion

সময়: 04:00 PM তারিখ: ০৭/১০/২০২০

উপ-প্রকল্প/কার্যক্রমের নাম: হাতিবান্ধা ইসলিয়া সড়ক

সভা যেখানে হয়: হাতিবান্ধা বাজার মাঠে

ইউনিয়ন: ইসলিয়াপাড়া ওয়ার্ড নং: ৫ মৌজা: ঘাঘরিয়াপাড়া উপজেলা: তেঁতুলিয়া জেলা: পঞ্চগড়

সাব প্রজেক্ট নং: EMCRP/W 23(8)

অংশগ্রহণকারীদের তালিকা (পরিচয় ও স্বাক্ষর)

ক্রম নং	নাম	বয়স	পুরুষ/মহিলা	গ্রাম	স্বাক্ষর / টিপসই
01	Sarwar Kamal Badsha 01915 004250	38	পুঃ	ঘাঘরিয়া পাড়া	
02	Rezaul Karim	22	পুঃ	ঘাঘরিয়া পাড়া	
০৩	আলি আহমদ	২৯	পুঃ	ঘাঘরিয়া পাড়া	আলি আহমদ
০৪	Jakir Hossain	53	পুঃ	ঘাঘরিয়া	
০৫	[illegible]	৩২	ঃ	মাঝির পাড়া	[illegible]
০৬	[illegible]	২৮	ঃ	ঘাঘরিয়া পাড়া	[illegible]
০৭	[illegible]	৩০	ঃ	ঘাঘরিয়া পাড়া	[illegible]
০৮	[illegible]	৪৬	ঃ	ঘাঘরিয়াপাড়া	[illegible]
০৯	[illegible]	২৮	ঃ	[illegible]	[illegible]
১০	[illegible]	২৫	ঃ	[illegible]	[illegible]

Figure: Attendance of consultation meeting for W23-8

Annexure-03: Pictures of sub-project component location and surrounding features with public consultation



Strating point of Ghaltpara holudia Road



Existing T-section of the proposed road



Market's shop on the way to the road



Bamboo bushes & vegetables yard on the sides of the road



RCC Bridge is on the pathway of the road



Consultation meeting with local community

Figures: Present condition of Ghaltpara holudia Road (W23-8) & Public Consultation meeting with Host community

Appendix-1: Environmental Screening Form for examining sub-project component

Environmental Screening Form for Sub-project W23-8

Sub-Project Description Form:

Name of Sub-Project:

EMCRP/W23 -Improvement of 15 Roads with culverts and side drain under Cox's Bazar District.

Name of the component: Ghaltpara holudia Road Id: 422945025

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Estimated total cost of sub-project (in Taka): 417,036,298.10 Tk.

Estimated construction period duration: 1 year

Estimated total cost of the component (in Taka): **16,481,937.62 Tk.**

Estimated Operation and Maintenance period (life of sub-project): Project design life more than 15 (Fifteen) years but Government policies on how long projects can operate in the camps.

District: Cox's Bazar **Sub-District**: Ukhiya **Union**: Haldiapalong

Name of Community/Local Area: Ghatipara and Nasirpara

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):

The Sub-Project is categorized as a village road and improvement with Bituminous Carpeting (BC) options. For drainage of rain water Construction of **04 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 128.0m, Ch. 372.0m, Ch. 552.0m & Ch. 636.0m of chainage and **01 no. Box Culvert** (dimension: 3.0mX2.0m) at Ch. 761.0m **of Chainage,** due to high land on the sides of the road **545.0m L-drain** at different Chainage as well as for **Earth** works, **Road safety** work and **Environmental Mitigation and Enhancement works** has been included in the estimation.

Estimated footprint / land area for this sub-project is 4,777.5 sqm.

Brief description of sub-project site: (e.g. present land use, Important Environmental Features (IEFs) near site, etc.:

This proposed Ghaltpara holudia Road belongs to Ghatipara and Nasirpara villages at Haldiapalong union, Ward-5 under Ukhiya Upazila. This road has started from Mir Ahmed DC road stretching 975 meters from South side to north side, along with ancillary connecting road, boundary fencing, market, settlements, trees, mosques, high land, household connecting road, agriculture fields, electric pole, bamboo bushes etc.

Overall Comments

The proposed component of the sub-project (Road improvement) is not located within any remarkable environmentally sensitive area and will not cause any severe affect to the environmental settings of the area, thus not going to create intimidation to important environmental features. No drainage congestion/water loggings have been observed in the road area. But, some local trees like betel nut tree, bushes etc., or additional vegetation may need to clear out due to construction activities, with appropriate offsetting measures to be taken. No agricultural productive soil will be used for the purpose. Earth will be compacted for stabilization. The inputs will be mainly at construction phase and limited within project boundary. Moreover, mitigation measures will be taken according to the ESMP for minimizing the air, dust and noise pollution.

It has been revealed that this project's scopes of works do not intend to overtake their area of lodgment and funding entity has no intention to do so. Moreover other issue has also been brought to their attention that drainage system and a bridge have also been included into the evaluation of this project since runoff from higher grounds are also a concerning matter during rainy season.

People of the subproject area are very much optimistic about the success of the project and are also eager to participate in the project activities. The subproject is environmentally sustainable and socially acceptable. The local community attended in the participatory public consultation meeting. Their community representatives as teachers, shop owners, farmers and elders have no objection to the construction this infrastructure in the proposed site; the community also appreciated the initiative of LGED to ensure safe access and better portability. The public consultation meeting results confirmed that improvement of this road will increase socio-economic interest in the communities and make lives easier for these people. They also requested to construct the road in accessible width so that small auto and motor vehicles can pass easily. Water flow from undulated terrains is a factor that should be considered for construction because 1 week worth of rain invites water flow which makes this surrounding area logged in several places. On another matter, locals requested to involve the local community to construction works and material storage monitoring duties.

The road is not located within any identified environmentally sensitive area, and therefore, does not seem to cause any adverse impact on the important environmental features. No significant impact is expected on the ecosystem and biodiversity, no agricultural land/ activities or fish farming will be disturbed, due to the construction of the sub projects. Only forest is found as homestead forest on high grounds of the location.

Types of waste to be generated during construction and operation phase:

During construction period solid waste will be generated due to construction activities. The types of wastes are brick pit, unused sand, wood, gravels, bitumen etc. The types of wastes are gravel, stones, rock, wood, copper wires, concrete, iron, plastic etc. Negligible amount of plastic will come as residue. Moreover, liquid waste will include chemicals of bitumen leftovers, motor oils, used oil, Degreasing solvents etc. Human wastes and kitchen wastes will be generated from labor camps as well.

Sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site including elephant migration routes and remaining forests:

Within the influence area of the subproject no historical sites were identified. This sub-project is situated within Ghatipara and Nasirpara villages at Haldiapalong, Ward-5 of Ukhiya Upazila, Cox's Bazar. Some sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site are at north side Nasirpara mosque & graveyard (100m), Middle Holudia mosque (100m), Haludia khal (500m), at south side Hatirghona Baitus-sarof jame mosque (600m), at east side Middle Haludia GPS (100m), Patan Fokir jame mosque (50m), Ghatipara community clinic (10m), Ghatipara station (400m), Nobin Mohajon Buddhist Bihar & cremation (1km), South Holudia GPS (700m), South Haludia Bazar (500m), Dargahmora jame mosque & graveyard (400m), Shirdeba jame mosque (600m) and west side Nasirpara jame mosque (400m), Nasirpara station jame mosque (300m), Nasirpara station (200m), Ghatipara Khalek market (5m), Moulavipara Ebtadia Madrasah (200m), Soliccha Chorra (700m). Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists.

Some human settlements and agricultural land are found around the sub-project area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). Elephant migration routes were about 14-15 km away from this sub-project. No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below:

Section A: Sub-Project Overview

Description of sub-project/component interventions:
The Sub-Project is categorized as a village road. Based on field survey, this sub-project involves of Brick Flat Soiling (BFS). According to the design this sub-project will be developed with Bituminous Carpeting (BC) from Ch. 00 to Ch. 975.0m.

Subproject interventions:

- **Bituminous Carpeting (BC)** options.
- **04 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 128.0m, Ch. 372.0m, Ch. 552.0m & Ch. 636.0m of chainage
- **01 no. Box Culvert** (dimension: 3.0mX2.0m) at Ch. 761.0m of chainage
- **545.0m L-drain** at different Chainage
- **Earth** works
- **Road safety** works and
- **Environmental Mitigation and Enhancement** works (description of such items can be found in BOQ)

Sub-project Location:

Important Features	
ID	422945025
District	Cox's Bazar

Upazila	Ukhiya
Union	Haldiapalong
WARD	5
Total Chainage	975m
Proposed Chainage	975m
Road Type	Village Road
Proposed Intervention Type	Bituminous Carpeting (BC)
Road Starting Point Coordinates	Latitude: 21^{0}17'29.9" N Longitude: 92^{0}07'31.4" E
Road Ending Point Coordinates	Latitude: 21^{0}17'55.5" N Longitude: 92^{0}07'29.9" E

Land ownership
Land is owned by Government.

Expected construction period: 1 year

Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water bodies, etc. and historical or socio-cultural assets): Please also explain any analysis on alternative location was conducted:

Some existing interventions within the sub-project location at north side Nasirpara mosque & graveyard (100m), Middle Holudia mosque (100m), Haludia khal (500m), at south side Hatirghona Baitus-sarof jame mosque (600m), at east side Middle Haludia GPS (100m), Patan Fokir jame mosque (50m), Ghatipara community clinic (10m), Ghatipara station (400m), Nobin Mohajon Buddhist Bihar & cremation (1km), South Holudia GPS (700m), South Haludia Bazar (500m), Dargahmora jame mosque & graveyard (400m), Shirdeba jame mosque (600m) and west side Nasirpara jame mosque (400m), Nasirpara station jame mosque (300m), Nasirpara station (200m), Ghatipara Khalek market (5m), Moulavipara Ebtadia Madrasah (200m), Soliccha Chorra (700m).

Within the influence area of the subproject no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (checked with local IUCN representative).

Section B: Environmental Screening

***B.1*: Environmental feature of sub-project location**

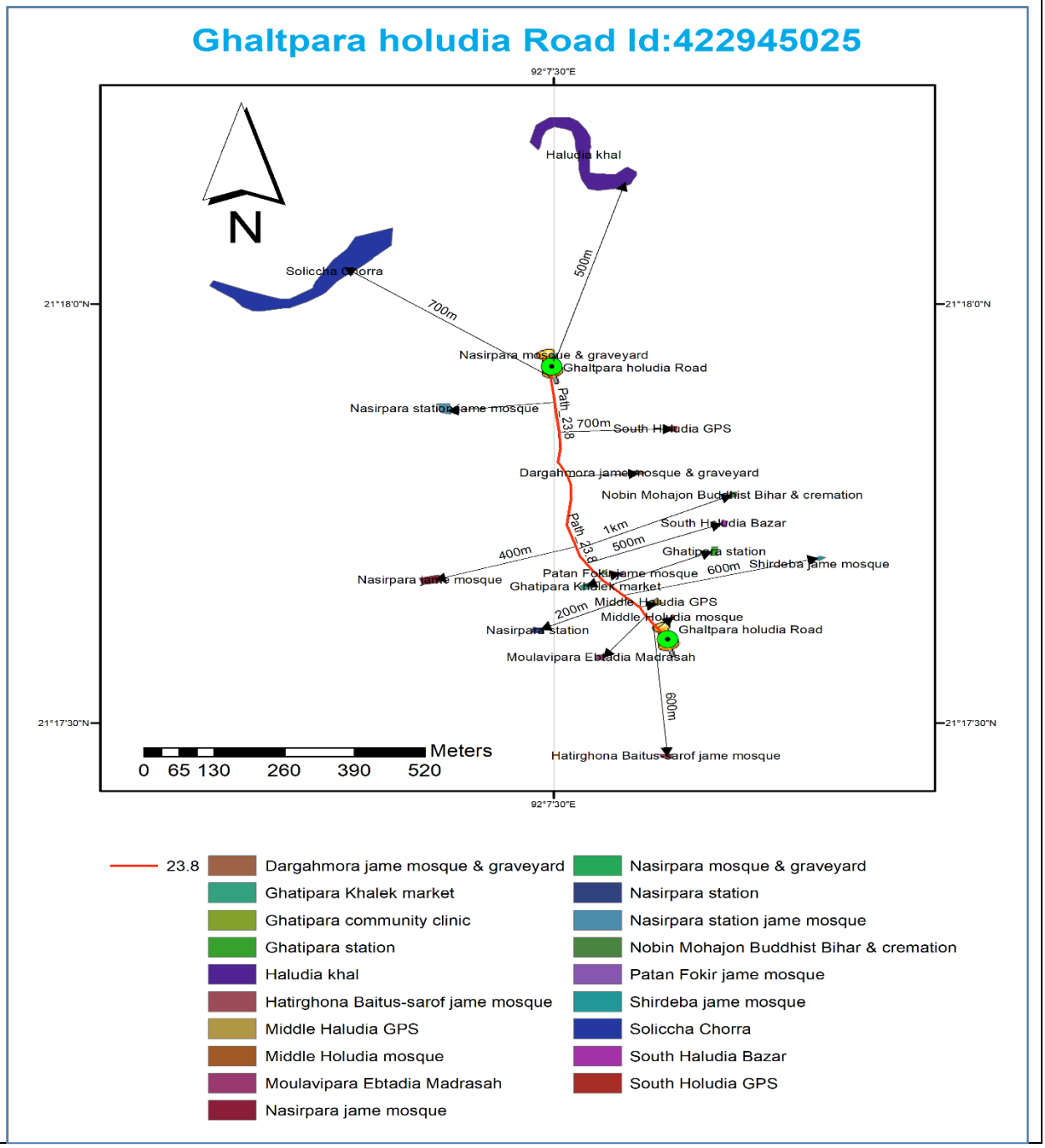
Description of cultural properties (if applicable, including distance from site):
Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests:

Sensitive environmental, cultural, archaeological, religious sites within 1 kilometer of site including at north side Nasirpara mosque & graveyard (100m), Middle Holudia mosque (100m), Haludia khal (500m), at south side Hatirghona Baitus-sarof jame mosque (600m), at east side Middle Haludia GPS (100m),

Patan Fokir jame mosque (50m), Ghatipara community clinic (10m), Ghatipara station (400m), Nobin Mohajon Buddhist Bihar & cremation (1km), South Holudia GPS (700m), South Haludia Bazar (500m), Dargahmora jame mosque & graveyard (400m), Shirdeba jame mosque (600m) and west side Nasirpara jame mosque (400m), Nasirpara station jame mosque (300m), Nasirpara station (200m), Ghatipara Khalek market (5m), Moulavipara Ebtadia Madrasah (200m), Soliccha Chorra (700m).

There are no other sensitive environmental, cultural, archaeological sites within the catchment area of this sub-project.

A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas are shown below.



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive features found in the footprint area, except matured vegetation on the sides of the road which are homestead gardens and forest. Several mosques, madrasa and local settlement were found during the survey. It will not be affected by the construction works, as the activities will be carried out within the existing subproject boundary and necessary preventive and mitigation measures will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*

No. There is no existence of Elephant corridor/ route now, which have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) potential impacts on remaining forests in/around camps Yes/No
N/A (This activity will be confined within the existing subproject boundary)

(3) Other issues: N/A

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:

Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of vehicle-related pollutants 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/ preventable by mitigation measures.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, tractor, trailer, etc. move on roads adjacent to sub-project throughout the day and night generate noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation): Landslide potential is low. There is low possibility of soil erosion or landslide during construction period of targeted sub-project. The impacts are negative but very small scale, site-specific within a relatively small area and adjustable by mitigation measures.
Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH): Groundwater is the main source of potable water in the Sub-project area. The shallow depth is about 60 feet to 70 feet and deep tube well depth is 700 to 800 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 600-800ft (Field survey, 2019). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer. Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)
Status of wildlife movement: N/A (None of the information was found about the wildlife movement in or across the area)
State of forestation: Patches of vegetation containing large and matured trees across the road side and some social forest on hill of the proposed subproject area are located within 200m radial distance.
Summary of water balance analysis (For water supply scheme only): N/A

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g. status of access road or any other facility required for sub-project to be viable): Patabri bazar connecting road, Moriccha bazar connecting road and Sheed ATM Jafor Alom connecting road are the available for access. It is possible to carry the construction materials on this road to the construction site with limited traffic flow since this road has small corridor to pass large vehicles.
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction: Toilet and water supply facilities will be ensured by the contractor in the vicinity of the construction area for all the components of the sub-project, electric connection will be established with the accommodation facility due for the workforce. Electricity is available in the area.
Possible location of labor camps: Labor camp can be established along the road since there are available open private lands of Ghatipara Abdur Kader Gong., DC Mir Ahmed and Abu Taher. However, this will have to be done with the consent of

land owner under a mutual agreement, with the supervision of the Engineer in charge.
Requirement and type of raw materials (e.g. sand, stone, wood, etc.): i) Bricks ii) Sand iii) cement iv) Gravel v) water vi) Aggregates vii) Bitumen etc. are the most common type of road materials used in construction.
Identification of access road for transportation (Yes/No): Yes. Patabri bazar connecting road, Moriccha bazar connecting road and Sheed ATM Jafor Alom connecting road are the available for access.
Location identification for raw material storage: Adjacent to labor camp or different location is available. However this will need placement on open fields and should be consulted with local committee. Material storage area must be well fenced and materials will be covered with tarpaulins.
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.): Earth/ mud, plastics, brick chips, dust from bricks during construction of project components will be produce. Also sludge will be produced from labor camp latrines and kitchen waste mostly composing of organic matters as fiber, starch, carbohydrates and proteins. 10% of the kitchen waste may be classified as plastics or non-biodegradables. Solid waste may amount to 20 kg daily and sludge may amount to 5 kg per day.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g. Solids wastes, liquid wastes, etc.): **Solid waste:** Residual waste from the labor camps will be generated. Equipment maintenance/vehicles on-site and scrap material will occur during construction works which are mostly solid waste. Leftover oils or spills from machinery can be a high probability generating liquid waste. Waste from civil works. And the quantity will be tentatively 150 kg. **Liquid waste**: During construction period fecal sludge will be generated from the labor camp and the quantity would be nearly 6 kg per day, which would be reduced in weight in course of time. Leftover oils or spills from machinery can be a high probability generating liquid waste.
Type and quantity of raw materials used (wood, bricks, cement, water, etc.): **Type:** i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction. **Quantity**: It is difficult to give exact figures of construction waste produced on a typical construction site.
Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards:

No such vegetation is present in the right of way. Specific soil amount is not needed for the project. The current condition explains that there is no aggregated soil on the right of way.
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) The possibility is Medium, for stagnant water bodies to occur. Because water usage will be higher during the construction period. By default, this area has no water logging troubles due to being natural channels. Moreover, no possibilities of stagnation of water in long run. So, local communities have stated that they do not have severe troubles with mosquitos or other disease vectors.
Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No pre - existing drainage channel.
Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. Because under this interventions, there is very little scope of damage to terrestrial or aquatic ecosystems or endangered species.
Activities that can lead to landslides, slumps, slips and other mass movements in road cuts: Scope of work leading to low scale effects of landslide. The impacts are negative but short-term and site-specific. It can be managed through mitigation measures.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description) Low, since both sides of the road is more or less similar elevation. The concentrated outflow will be managed since the sub-project has included drains.
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: No
Chance of long-term or semi-permanent destruction of soils: (High/Medium/Low with description) No
Possibility of odor and water, soil quality impacts from SWM and FSM disposal system: (High/Medium/Low with description)

No
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) There is no possibility of stagnant water bodies remained for encouraging mosquito breeding and other disease vectors, during the operation phase.
Likely direct and indirect impacts on economic development in the project areas by the sub-project: Construction or implementation of a road project substantially contributes to the development of the project areas. It surely improves the communication network, reduces the transport time, increases the trade and business in/around the areas, and ensures access to better living conditions with amenities, better educational and job opportunities and health facilities. Thus, the direct and indirect impacts on economic development in the project areas would be enormous by this sub-project.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No existing drainage channels or surface water bodies found in the project area, therefore, no such effect can be anticipated
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. There are no protected areas in or around project sites, and no known areas of ecological interest.
Activities leading to landslides, slumps, slips and other mass movements in road cuts: The entire sub-project component area is nearly flat; thus, no such type of impacts is anticipated.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) No
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: Improved communication will definitely increase the traffic/ vehicular movement, which must increase the light and noise pollution, but air pollution effect will not be increased significantly, as the proposed BC road will reduce the pollution generated from dust on the muddy road, especially during the dry season and if the vehicles are maintained in good conditions

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

Section D: Environmental Screening Summary of the Work Package-23.8

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
1: Sub-Project Interventions	**Air quality**	Under the subproject intervention the overall score is **low**.	• Limiting earthworks; • Watering of dry exposed surfaces and stockpiles of aggregates at least twice daily, as necessary; • Requiring trucks delivering aggregates or bricks and cement to have tarpaulin cover and Limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Covering of trucks; • Records of air quality inspection;	Visual monitoring of air quality and if requires, air quality test (CO, $PM_{2.5,10}$) once in construction period in winter season.
	Soil impacts	Under the sub-project intervention the overall score is **low.**	• Precautions might be taken when rainstorms are likely, when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms. • The earthwork sites where exposed land surface is vulnerable to runoff shall be consolidated and/or covered. • The material stockpile sites shall be far away from surface water bodies and areas prone to surface run-off. Loose materials shall be bagged and covered. • Channels, earth bunds, netting, tarpaulin and or sand bag barriers	Construction Contractor monitored by Consultant and PIU	• No visible degradation to nearby drainages, • *khals* or water bodies due to soil erosion. • Rain storms in construction phase.	Monitoring as weekly basis.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
			shall be used on site to manage surface water runoff and minimize erosion. • The overall slope of the work areas and construction yards shall be kept to a minimum to reduce the erosive potential of surface water flows elsewhere.			
	Hydrology (surface and groundwater)	Under the subproject intervention the overall score is **low**.	• All precautions to store chemicals/oil/fuel properly so that no chance of spill. • Workers must specify waste dump locations to avoid littering which in turn might negatively affect surface and ground water. • Monitor water quality according to the environmental management plan.	Construction Contractor and monitored by Consultant and PIU	• Areas for stockpiles, storage of fuels and lubricants and waste materials; • Records of water quality inspection; Water Quality Test • (National Drinking Water Quality Standard Parameters)if requires; • No visible degradation to nearby drainages, *khals* or water bodies due to	Water quality test (mainly GW) twice during the construction period in six months interval.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
					construction activities. • Records should be kept and logged.	
2: Pre-construction Phase	**Sanitation, water supply**	Under the subproject intervention the overall score is **low**.	• Provide suitable housing, adequate supplies of potable water, and toilet and bathing facilities within labor camp area for the assigned laborer. • Provide means for disposing of wastewater from toilets, baths and food preparation areas either through a septic tank and soak away, or holding tank with removal by vacuum truck. • Records for any type of training or awareness building sessions must be kept at site.	Construction Contractor and monitored by Consultant and PIU	• Site-specific H&S Plan; • Records of supply of uncontaminated water; • Record of Health &Safety orientation trainings; • Condition of sanitation facilities for workers	Visual inspection by PIU and supervision consultants on monthly basis
	Transportation	Under the subproject intervention the overall score is **low.**	• Contractor should verify vehicles for the suitability of carrying, loading and unloading of materials	Construction Contractor and monitored by Consultant and PIU	• Record of regular inspection. • Record of accidents/incidents	Monthly monitoring.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
	Storage of construction materials	Under the subproject intervention the overall score is **low**.	• Orienting concerned person and team assigned for the construction work.	Construction Contractor and monitored by Consultant and PIU	• List of materials and sources of materials;	During implementation phase, as necessary with discussion with PIU, Consultant
3: Construction Phase	**Wastes**	Under the sub-project intervention the overall score is **low.**	• Prepare and implement on-site waste water runoff and labor camp waste management plan approved by PIU and consultants. • Wastes must be placed in the designated bins which must be regularly emptied. These shall remain within demarcated areas and shall be designed to prevent wastes from being blown out by wind. • All waste must be removed from the site and transported to a disposal site.	Construction Contractor and monitored by Consultant and PIU	• Complaints from community; • Regular inspection of waste management activity; • Waste disposal record.	As work weekly progresses
	Cut and fill Activities (Cutting of hill slope and earth removal from borrow areas caused for soil erosion and	Under the sub-project intervention, the overall score is low.	• During construction cut and fill will be balanced as far as is possible. Designs shall ensure that as far as possible all cut and fill activities are balanced • Proper care will be taken during cutting and filling so that slope or toe of the road embankment	Contractor, environmental specialist of D&SC	• Location of road alignment and slope.	Daily as work progresses

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
	landslides)		remain within the right of way and does not disturb the crop.			
	Storage of materials	Protected and safety storage to be needed for construction materials storage. Not interrupt natural land contours, disturbance in natural drainage patterns and logging of water and the overall score is **low.**	• With the assistance from site management committee in Camp to identify the storage site and other requirements, which will be approved by PIU and consultants.	Construction Contractor and monitored by Consultant and PIU	• List of materials and sources of materials; • Storage areas for materials and equipment.	Monthly basis during implementation phase, as necessary with discussion with PIU, Consultant
	Removal of Vegetation (May cause soil erosion and their deposition on nearby crop field, affecting soil quality and productivity)	Under the sub-project intervention, the overall score is **low.**	• If during detailed design cutting of trees is required, compensatory plantation for trees lost at a rate of 5 trees for every tree cut. • Prevent workers or any other person from removing and damaging any flora (plant/vegetation) and fauna.	Contractor, environmental specialist of D&SC	• Complaints from community;	Daily

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
	Noise pollution	Under the subproject intervention the overall score is **low.**	• Consultation with affected people; not to operate noisy equipment during working period; • No noisy work after 5.00 pm. • Sound suppression for equipment; • Ear protection for workers. • Conduct noise quality monitoring as per EMP.	Construction Contractor and monitored by Consultant and PIU	• Number of complaints from stakeholders; • Use of silencers in noise-producing equipment and sound barriers; • Noise Level following decibel meter (dB)	Inspection by PIU and supervision consultants on monthly basis;
	Air pollution	Under the subproject intervention the overall score is **low.**	• Water spraying for dust control; construction materials with potential for significant dust generation shall be covered; no smoke emitting equipment; and limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor and monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Records of air quality inspection.	Visual observation and monitoring of air quality during construction period.
	Road Safety and Accidents	Under the subproject intervention the overall score is **low.**	• Erection of suitable signage at construction sites • Direct observation and discussion with local people • Restrict the transport of oversize loads. • Operate construction vehicles to non-peak periods (night) to minimize the traffic disruption. • Enforce on-site and access road speed limits.	Construction Contractor, environmental specialist of D&Sc.	• Complaints from communities, pedestrians	Day basis during work time

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
			• The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc. • Local residents should be kept informed about planned Works			
4. Post Construction	**Road Safety**	Under the issue the overall score is **low**.	• Install traffic signs for speed limit, speed breaker where needed, Mile post and create adequate ***traffic*** detours, and sufficient ***signage*** & ***warning*** signs, Post speed limits and suitable bending on the road. • The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc.	Construction Contractor, environmental specialist of D&Sc	• Road signage and safety instruments at suitable locations and chainage	Immediately after the construction work is over.
	Tree re plantation	Under the issue the overall score is **low**.	• Replantation of trees during monsoon period • Maintain of trees properly • Check survival of trees and replant the dead trees	Construction Contractor, environmental specialist of D&Sc	• Number of complaints from stakeholders; • Records of trees number and tree plantation inspection;	Immediately after the construction work is over.
5.	**Maintenance**	Under the issue	• No advertisement/boardings shall	LGED	• Number of	During Operation

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
Operational Phase	**of road and assets** (Road accidents may increase due to higher number of vehicles using the roads at increased speeds)	the overall score is **low**.	be allowed within the Right of Way limits of the project road. • Regular maintenance and cleaning of assets such as sign boards, road safety sign etc. shall be undertaken. • Clear smooth speed breaker/rough surfaces should be clear in views. • Regular maintenance of road surface and shoulders.		complaints from stakeholders;	under LGED's regular maintenance program in each 3 years.

* Overall Impact Score: High = Likely to cause long-term E&S impacts; Medium = Likely to cause temporary impacts; Low = Likely to cause little, short-term impacts

**Post-construction phase denotes the time period contractor use to clear and clean up the sites after the construction work is ended, perform tree plantation, grass turfing, and minor rectification till the official handing over the site to LGED, or owner of the site.

Recommendation for further environmental and social assessment and/or site specific environmental and social management plan: Yes

**If yes, please specify what assessments/plans would be required.* Mention some recommendation on E&S assessment …. ESMP

If site specific environmental and social management plan (ESMP) is followed the impacts can be mitigated and monitored. ESMP is attached.

Appendix-2: Environmental and Social Management Plan (ESMP)

ESMP for Access and evacuation Roads; *(LGED/EMCRP-W23.8):* Ghaltpara holudia Road Id:422945025.

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
Pre-Construction Stage	Loss of land / and other physical assets	• No land acquisition is allowed within this sub-project activities So, there are no any mitigation measures according to this impact.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of livelihood	• Under this subproject, there is no scope of negative impact of adjacent livelihoods	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Stakeholders Engagement	• All of the project stakeholders should be consulted • Separate community level consultation meeting with the potential affected HHs • Consultation meeting with host communities about the project objectives and scope of works	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of right to access	• Project to ensure thorough analysis of alternatives that access enjoyed by the community remains intact. • In case of unavoidable circumstances, alternative access will be provided.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Site Selection & implementing interventions: Human-elephant conflict	• Selection of sub-project sites and all implementing interventions must take place outside of the elephant corridor/influence area.	PIU	Environmental Consultant of PIU, PSC
Pre-Construction Stage	Site Preparation: Soil Erosion; Alteration of natural drainage	• Our selected sites avoided the low land near the water bodies or natural flow path to avoid the flash flood or any kind or surface runoff.	PIU & Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Tubewell location within the construction site is not near to any kinds of latrine and soaks well which could be contaminated by those. • After completing the development we restored the place as like before to avoid the cut and fill operational problems. • This site is in the local community, so we discussed with the local community to avoid any conflicts related local habitation, culture. • Sub project intervention mustavoid of natural disturbance of existing slop and natural drainage. • The contractor ensuring sound environment for the local residents near the sub project site.		
Construction Activity	Noise from construction works	• Construction activities mostly will finish at day time within 05 PM, and must confirm proper measures for avoiding any disturbance. • All Personal Protective Equipments (PPEs) must be ensured in sites before starting any kinds of construction works.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Dust	• Acceptable range of emission of CO, particulate matter [SPM (**Suspended particulate matter)**, PM2.5, 10] and Hydrocarbons must be maintained through good construction work practices • Dust generation must be limited as a result of clearing, leveling and site grading operations with	Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		using water florescent manually and through water pipes. • Dust generation due to vehicle movement on connecting road shall be controlled by watering the path at limited level		
Construction Activity	Safety Issues	• Unauthorized entry is completely prohibited in our site and take necessary measures for preventing this problem • Before works started Contractor must provide proper training and guidelines on health and safety issues to the labors and associated staffs. • Records of every training must be kept at site. • All kinds of Child labour are completely prohibited in every site. • Every construction materials storage site will be well fenced by Tin and safety caution tape.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Traffic Management	• Contractors will maintain proper route for traffic management which is to beconsulted with and confirmed by the Executive Engineer of Cox's Bazar.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Conflicts with existing users due to the scarcity of resource base.	• A detailed assessment of the available resources and consent of the local representative for withdrawal of water from existing surface water sources shall be taken. • If ground water is withdrawn, adequate approvals from the appropriate department need to be undertaken before setting up bore wells.	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Any type of consent letter or agreement for withdrawing water from either surface or underground sources will be kept on site. • Local community must be consulted before any construction works starts.		
Construction Activity	Increase in road accidents	• Maintain safety measures during the movement of heavy machinery and equipment. • Local community will be trained up on traffic management and awareness.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Labour Base Camp: Conflicts with the local residents	• Awareness building session will be undertaken about prevention of child abuse, child marriage, GBV, sexual harassment, trafficking of women and children as well as illegal drug trade. Written records of this awareness building session shall be kept on site. • Work force should be prohibited from disturbing the flora, fauna including hunting of animals, wildlife hunting, poaching and tree felling. • Adequate facilities ensuring sanitation for labour camps will be put in place • Treated water will be made available at site for drinking purpose. • Adequate accommodation arrangements for labour forces. • Labor code of conduct is to be disclosed through consultation.	Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Construction Activity	Waste Management: Improper	Preparation of a waste management plan covering the	Contractor	Environmental

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
	management and handling of hazardous and non-hazardous waste during construction.	following aspects: • Residual waste from the temporary accommodation facilities for labor Waste and from equipment maintenance/vehicles on-site • After completion of construction works. So, recycling process is not applicable. • Proper consents for hazardous waste management.		Consultant of PIU, PSC
Construction Activity	Health & Safety Risks: • The potential for exposure to safety events such as tripping, working at height activities, fire from hot works, smoking, failure in electrical installation, mobile plant and vehicles, and electrical shocks. • Exposure to health events during construction activities such as manual handling and musculoskeletal disorders, hand-arm vibration, temporary or permanent hearing loss, heat stress, and dermatitis.	• All construction equipment will be properly inspected timely. • The risk assessment will be prepared and communicated prior to the commencement of work for all types of work activities on site. • Preparation of proper walkways and clearly designation as a walkway has to be ensured; all walkways shall be provided with good conditions underfoot; signposted and with adequate lighting. • Proper Signpost at any slippery areas will be ensured in construction site. • Fire extinguishers will be located at identified fire points around the site. The extinguishers must be appropriate to the nature of the potential fire. • This sub project has Proper communicative emergency response plan (ERP) with all parties, the ERP to consider such things as specific foreseeable emergency situations, organizational roles and authorities' responsibilities and expertise, emergency	PIU & Contractor	Environmental Consultant as well as Social Development and Gender Specialists of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		response and evacuation procedure and personnel will be trained and drilled to test and ensure the coherence with the plan. • All people of construction site will be concerned about the safety and maintenance of Electrical equipment; works will be carried out on live systems. • Provision to first aid box in sub-project areas will be ensured. • Proper Emergency evacuation response plan will exist in sub-project area. • All safety equipment will be available in sub-project site (safety, size, power, efficiency, ergonomics, cost, user acceptability etc.), the lowest vibration tools will be provided that are suitable and can do the works. • Awareness training will be given to all personnel involved during the construction phase in order to highlight the heat related illnesses of working in hot conditions such as heat cramps, heat exhaustion, heat stroke, and dehydration. Written records of this awareness training shall be kept on site. • Adequate quantities of drinking water will be available at all Sites, on different locations within the site. • Provision to maintain proper PPE wherever necessary and to ensure that there are satisfactory washing and changing facilities.		

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Provision to ensure all workers exposed to a risk are aware of the possible dangers and also given thorough training on how to protect themselves and there should be effective supervision to ensure that the correct methods are being used.		
Operation &Maintenance	Noise disturbances to fauna	• Provision to maintain noise and vibration from the operation and maintenance of machinery and equipment by proper monitoring and measures. • Provision to take necessary lighting, caution for the works and necessary maintenance should be done in day light.	PIU	Environmental Consultant of PIU, PSC. Union Member
Construction activity	Odours and pollution caused by leaking latrines and faecal sludge, and solid wastes impacting surrounding water bodies, flora and fauna	• Preventative maintenance schedule should be followed. • Solid organic wastes should be stored in bins and/ or skips and emptied regularly at a designated waste disposal area away from the camp site. If no designated site is available within the reach, a dug-hole at a nearby place can be used with periodic filling with soil layer for preventing pollution and generating nutrient rich compost soil over time.	PIU	Environmental Consultant of PIU, PSC. Union Member
Decommissioning during the project implementation period (including site clearance after the construction)	The impacts are similar to those listed in construction stage: • Pollution from waste materials • Health & Safety risks to workers and local community	• Contractor must prepare a demolition and waste management plan including following directive aspects given hereunder.	PIU / Contractor	Environmental Consultant of PIU, and Executive Engineer of Cox's Bazar

Waste Management Plan:

The Contractor shall develop a waste management plan for various specific waste streams (e.g., reusable waste, flammable waste, construction debris, food and organic waste etc.) prior to commencing of construction and submit to LGED for approval. The plans must include following principles or series of actions, which will be carried out/followed by the contractor and supervised by the Field level Environmental Specialist and Social Development Specialist.

For wastes:

- The quantity of waste materials shall be minimized by 3R (Reduce, Recycle and Reuse) approach, and wastes shall be segregated accordingly, wherever practical; and stored in designated places/facilities in the site.
- Construction site shall be maintained in a cleaner, tidy and safe condition and appropriate facilities shall be provided and maintained as temporary storage of all wastes before transportation and final disposal.
- Hazardous waste viz. waste oil etc. will be collected and stored in a paved and bounded area and subsequently sold to authorized recyclers.
- The scrap material generated from related construction activities will be collected and stored separately in the stack yard and sold to local recyclers.
- All wastes generated during construction shall be disposed off in an environmentally acceptable manner. This will include consideration of the nature and location of disposal site, so as to cause less environmental impact.
- Other leftover non-hazardous wastes, including construction debris shall be transported to an approved disposal site by pick up tracks or back loaded vehicles with proper care.
- Organic wastes produced in the camp site during the construction period shall be collected and transported in vehicles covered with tarps or nets to prevent spilling waste along the route to the designated disposal site;
- Burning of any type of wastes in the construction site shall be prohibited completely.

Prepared by: Harogopal Kabiraj, Environmental Focal Person, +8801714980171

Tanvir Ahsan Haque, Environmental Specialist, +8801688117059

Ms. Sadia Azad, Disaster and Climate Change Specialist, PIU.

Reviewed by: Md. Saiful Islam, Field Level Environmental Specialist, +8801913442006

Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.8

In consideration to the above-mentioned environmental impacts and their mitigation measures for all sub-projects, individual BOQ for each component has been prepared. Following tables will illustrate such items of enhancement and impact mitigation works as well as considering the emerged situation of COVID-19, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites.

Cost of Environmental Enhancement Works for W23-8 in BOQ

Sl no.	Description of item	Quantity	Unit price	Total amount (BDT)
1.	**Grass Turfing** Turfing on embankment top and slope, building compound & any critical place with good quality turf supplied by the contractor of not less than 225mm square in dimension including placing and watering till grass is fully grown, etc. all complete as per direction of E.I.C. (Payment to be made only when grass is fully grown)	2,916.0sqm	@38.15 Tk. Per sqm	111,245.40
2.	**Dust suppression measures** Dust suppression measures like water sprinkling on aggregates/unpaved roads, in and around the work site and as per direction of E-I-C	975.0m	@ 2.56 BDT	2,496.00
3.	**Water Supply and Sanitation** Providing and maintaining adequate portable water supply, sanitation, cleanliness facilities at camp site and work site to the entire satisfaction of Engineer-in-charge. **Temporary Toilet:** Construction of temporary toilets in work site/ rest area complete as per design and specifications and approved by the Engineer-in-Charge. There should be 1 camp in each site. In each camp, there should be 1 no of toilet for	2 nos.	@12822.86 per toilet	25,645.72

Sl no.	Description of item	Quantity	Unit price	Total amount (BDT)
	women and 1 no of toilet for men.			
4.	**First Aid Box** Supplying, equipping and maintaining adequate first-aid box throughout the working period at worksite and site office, and erect conspicuous notice boards directing where these are situated and providing all requisite emergency medical first aid kits, including complying with the government medical or labour requirements at all times, and provide, equip and maintain necessary dressing kits throughout the working period for attending minor injuries, etc. all complete as per requirement and full satisfaction of Engineer-in-charge.	1 no.	LS @5000 Tk. Per box	5,000
5.	**Drinking Water Facilities** Providing continuous adequate drinking water supply at worksite and site office as well by installing necessary tube-well/s where applicable or any other means depending on local situation, also providing essential arrangement for storing drinking water by supplying portable best quality water tank equivalent to Gazi/Padma of adequate capacity depending on the number of users, including supplying 1 (one) no. best quality water filter of minimum capacity 30 liters with necessary kits, etc. all complete as per satisfaction and direction of the Engineer-in-charge.	2 nos.	LS @ Tk. 30,000	60,000
6.	**Traffic Management** Maintaining traffic management at worksite from time of commencement of contractor's activities to time of completion activities, including ensuring that the road is safe for users, providing a safe working area for those involved in work on trafficked network and minimizing any disruption to smooth flow of traffic (this	1 no.	LS @ Tk. 15,000	15,000

Sl no.	Description of item	Quantity	Unit price	Total amount (BDT)
	includes providing necessary barricades, warning signs/lights, guide signs, flagmen, maintaining diversion roads by cutting, filling, constructing, etc. or by any other means) in accordance with the full satisfaction of the Engineering-in-charge.			
7.	**Personal Protection Equipment for Workers** Providing and maintaining appropriate (safe design, fit and comfort) personal protection equipment (PPE) to ensure the highest possible protection for employees in establishing and maintaining a safe and healthful working environment at workplace, including demonstrating, providing training on proper understanding and development of skill in the use of PPE, including supplying (i) best quality safety jacket, (ii) suitable hand protection gloves, (iii) appropriate foot protection shoes, (iv) best quality safety helmets, face shields, ear muffs etc. (v) suitable eye protection goggles	LS	LS @ Tk 30,000	30,000
8.	**Tree plantation** Tree plantation to compensate the felled down trees and enhance the ecological condition in the subproject area- preferably local fruits, flowers, medicinal and ornamental trees- Mango, Jackfruit, Jam, Kathbadam, Chalta, Krisnachura, Bokul, Jarul, Polash, Kadom, Shimul, Neem, Arjun, Amloki, Horitoki, Bohera, Mahogany, Palm Tree, Chambal, Rain Tree, Shil koroi, Satim, Sishu (including protection, fencing and conservation during project defect liability period): Preferably at both sides of Road where space is available (fencing as per LGED rate schedule 5.26.14) (Contractors will also be instructed by the consultant and PIU prior to the tree plantation work) at an interval of 10 feet.	120 nos.	@ Tk. 1000	120,000
9.	**Motivation training** Motivation training (twice: before and after construction start) of the Upazila	1 no.	LS @ Tk. 10,000	10,000

Sl no.	Description of item	Quantity	Unit price	Total amount (BDT)
	Engineer 'sand Contractor's representatives on safety practice and as per direction of the E.I.C.			
10.	**Waste disposal facility** Temporary camp site waste disposal facility improvement 2 nos. (1 no of organic waste and 1 no of inorganic waste disposal facility) and as per direction of E.I.C.	LS	@ Tk. 5000	5,000
11.	**Water Test (Drinking Water samples)** Water samples are to be collected periodically (half yearly) from the tube well at labor shed area for laboratory analysis of different parameters such as pH, arsenic, iron, chloride, hardness, total dissolved solids, nitrate, nitrite, coliform, electrical conductivity etc. all complete as per direction of E.I.C. (including the cost of actual fees for testing from reputed laboratory and report) as desired by E.I.C.	LS	@ Tk. 5000	5,000
12.	**Working labour shed:** Construction of Labor shed (Size: 30'x20') with C.I sheet Roofing, Tarza fencing and brick soling floor as per requirement and direction of the E-I-C.	1 no.	LS @ Tk. 30,000	30,000
13.	**Environmental management** Environmental management costs of the Environment & Social/ Safeguard Personnel for Environmental and Social Management and Monitoring during construction and operation phase for their salary & transport (Net payment excluding Tax &VAT). And as per direction of the E.I.C. **(One Safeguard Personnel for R6, R8, R9, R12 & R15)**	1 person	Monthly basis @Tk. 35,000.00 for 12 months. One person covering 5 roads i.e.35,000Tk.*12months*(1/5 one road).	84,000.00
	Sub-total Bill: Environmental facilities			**503,387.12**

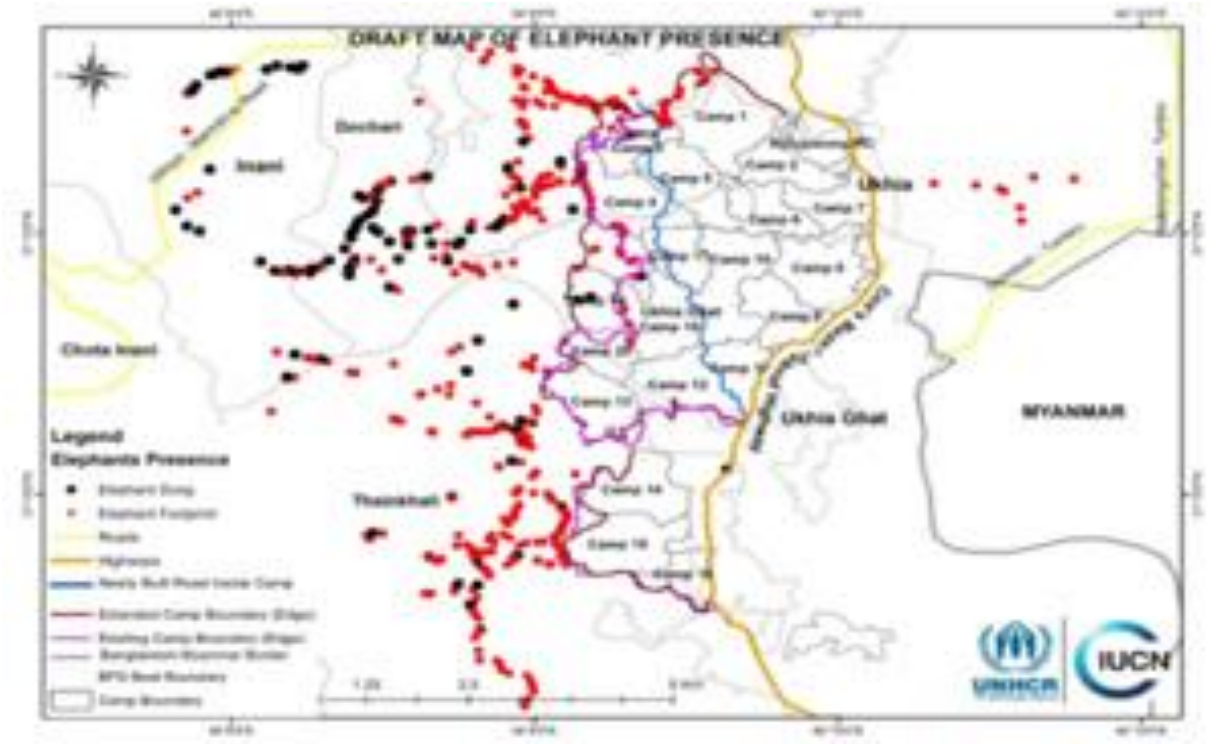
Cost of H&S Measures under COVID 19 Situations for W23-8

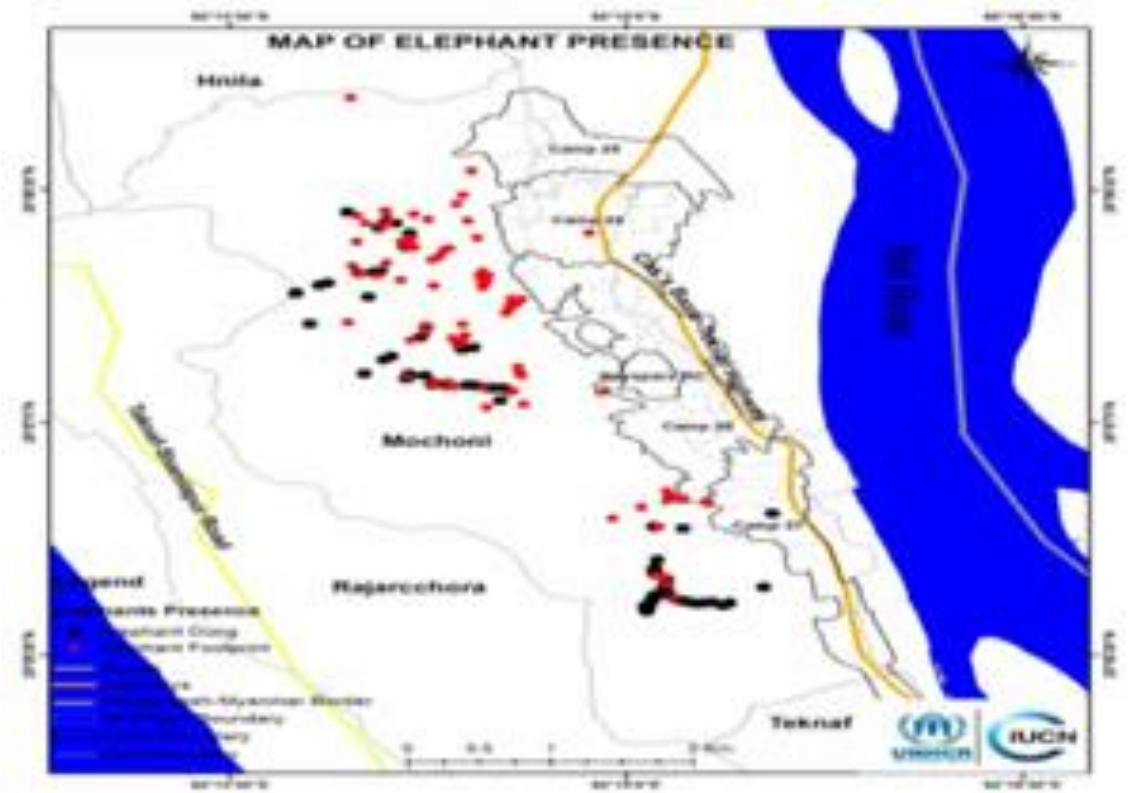
Considering the emerged situation, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites. The cost is estimated counting 20 workers for 270 active working days (9 months in a year) in a contract period for one site under this package (EMCRP/W-20.8).

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
1.	Non-Contact IR Digital Thermometer	01 nos. in each site	N/A	N/A	5,000.00	1	5,000.00	Each site office will have a thermometer for checking body temperature every morning at the entrance of the working site
2.	Wash Basin with Small Water Tank, Bucket and Mug (or piped water supply)	01 nos. in each site	N/A	01 nos. in each camp	10,000.00	2	20,000.00	Wash basin to be installed at favorable locations immediately after the entrance to the facility
3.	Trash bin (covered)/Paddle Bin	01 nos. in each site	N/A	01 nos. in each camp	550.00	2	1,100.00	
4.	Bar Soaps (150 gm each)	54		68	50.00	122	6,100.00	To be placed in a case/holder on the basin, for washing hands for max. 23 people a day and showering of 20 workers in each labor camp.
5.	Hand Sanitizer (2 nos. 250 ml bottle and 5 liter Can for Refill)	2 bottles and 1 Can for each site	N/A	N/A	4,000.00	1	4,000.00	2 bottles and a 5 litre can for each Site office
6.	Face Shield/ Protective Safety Goggles	12 nos. for each site		N/A	400.00	12	4,800.00	For labors who work in close contact, 12 in each site

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
7.	One time Mask (Disposable) for Contractors' Staffs	3 nos. each day in each site		N/A	12.00	810	9,720.00	Reusing N95/KN95 mask will not be a manageable option in field scenario, one time disposable medical/surgery mask a good option instead.
8.	Cloth mask for Workers	N/A	20 nos. for each labor camp		35.00	360	12,600.00	A worker will use a mask for 15 days with everyday washing
9.	Floor Cleaner (1 litre Can)	1.5 Can	N/A	2 Can	250.00	3.5	875.00	
10.	Detergent Cleaner	N/A	1 kg in each camp/month		400.00	9	3,600.00	To be used for washing clothes, masks and tools & equipment, etc.
11.	Miscellaneous cost				20,000.00	1	20,000.00	Contingency cost for medical emergency and compensation for workers, subject to proper documentation
	Grand Total						**87,795.00**	

Appendix-4: Elephant Migration Routes Map





Elephant presence map (latest information published by on 24 May 2018)

Appendix-5: Location Map of each Sub-project component

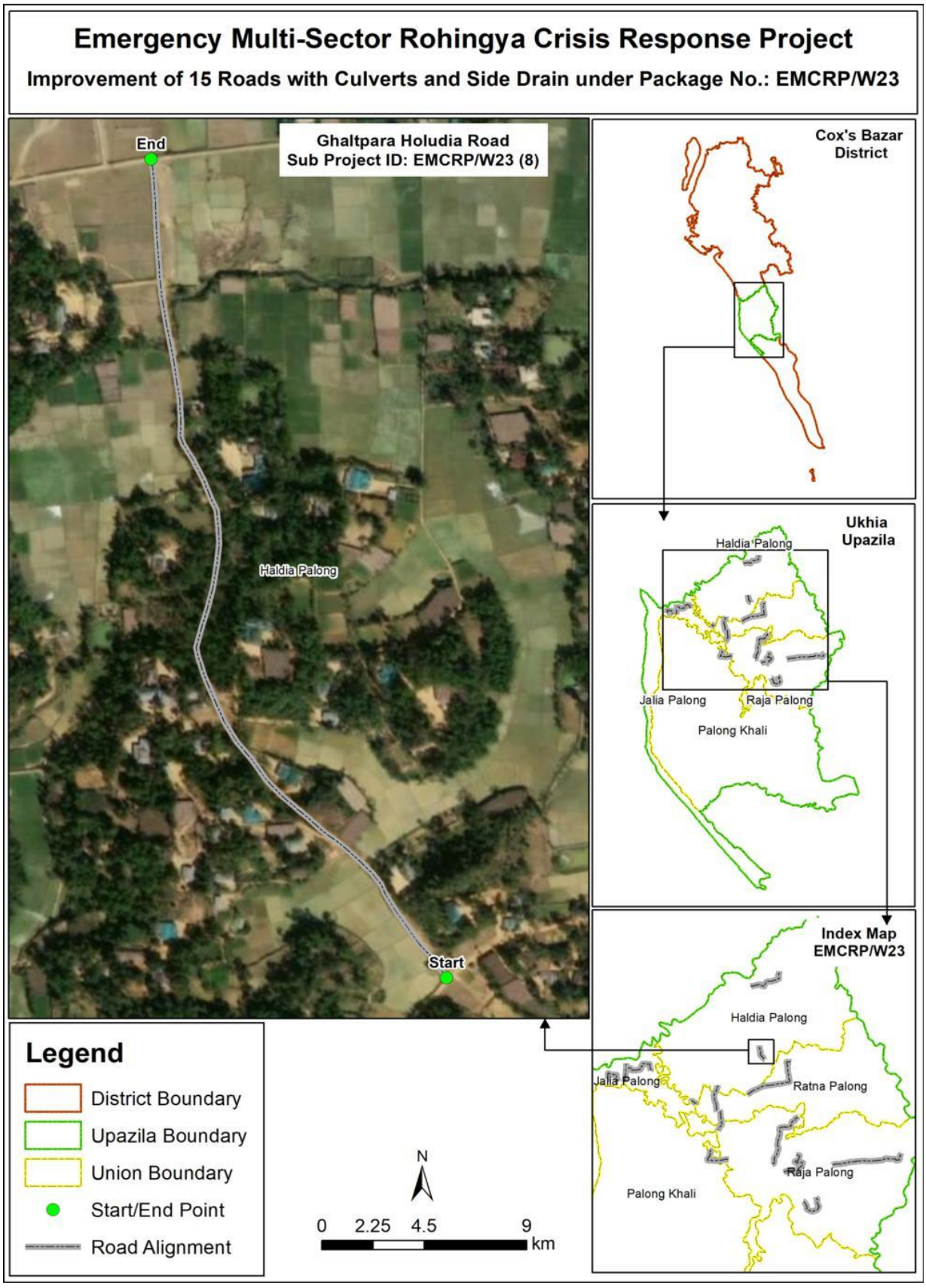
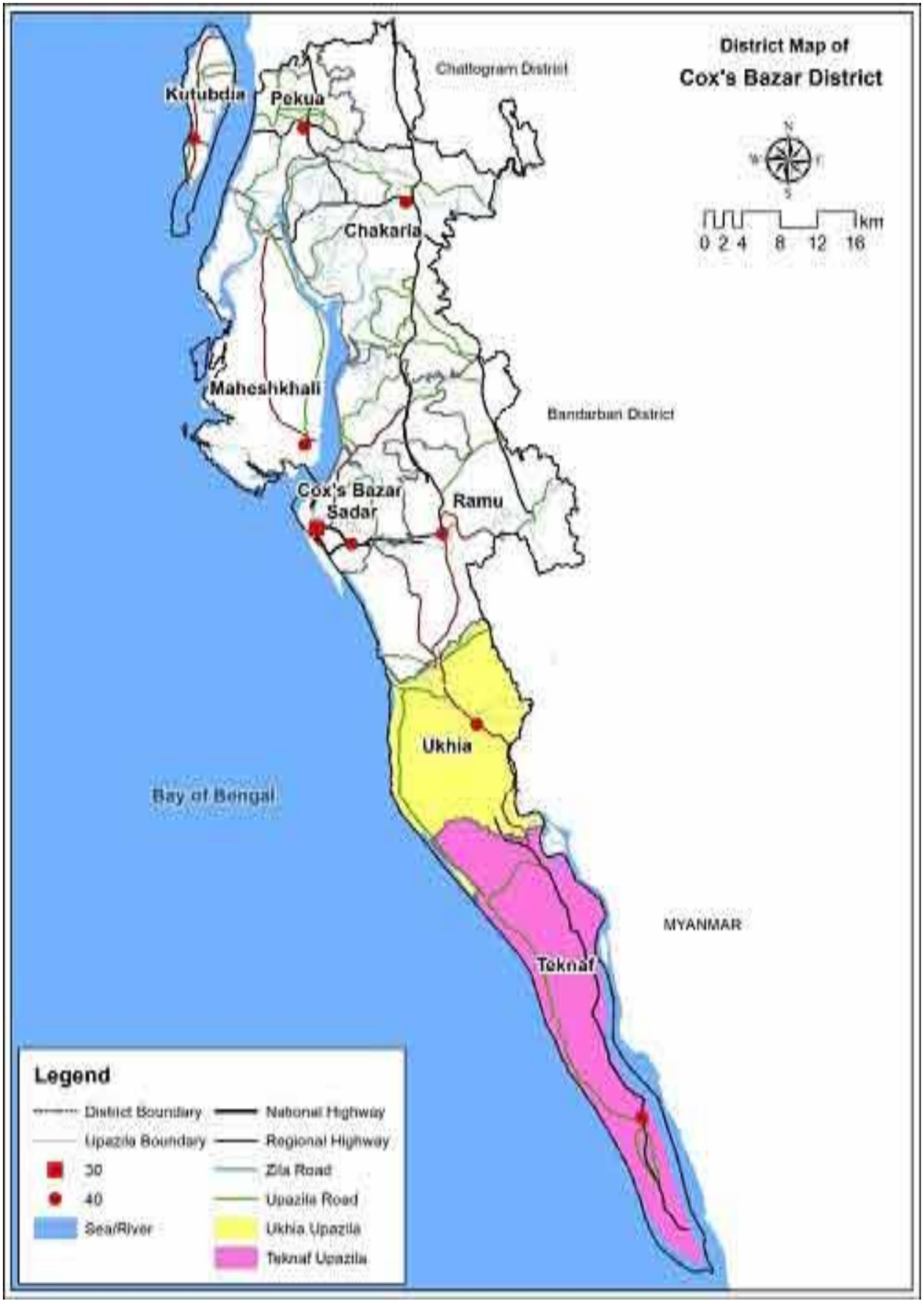
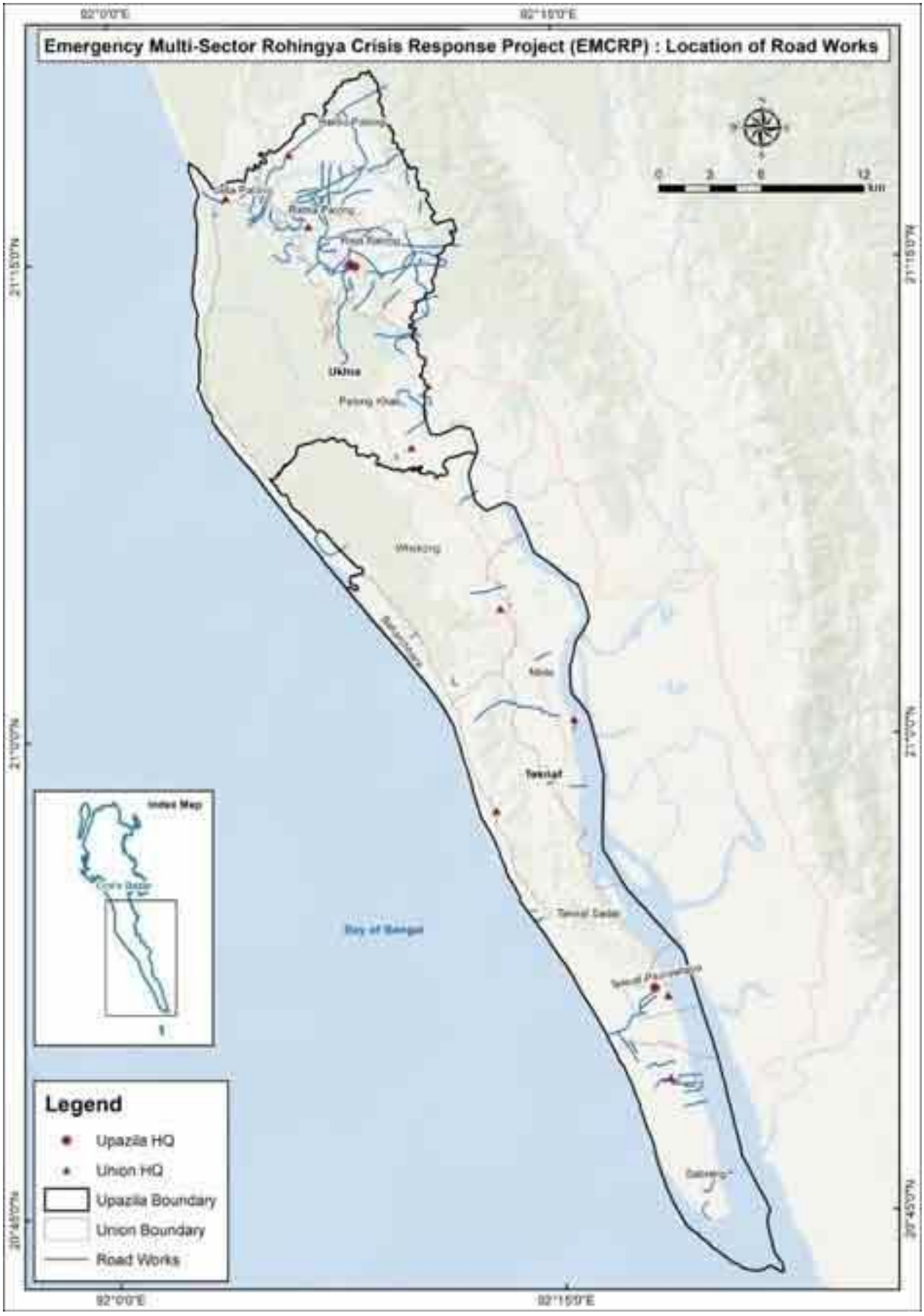


Figure: Location Map of W23-8



District map showing Ukhiya and Teknaf Upazila



Upazila map locating proposed roads

GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH
Ministry of Local Government, Rural Development and Co-operatives
Local Government Division
Local Government Engineering Department

Emergency Multi Sector Rohingya Crisis Response Project (EMCRP)

Project ID: P167762 **IDA Credit No. 5561-BD**





Environmental Screening Report

For Bottoli-Pukuria Road Id:422944060 with culverts and side drain under Cox's Bazar District.

Under the package no. EMCRP/W23

Funded by:

THE WORLD BANK
IBRD • IDA

Government of the People's Republic of Bangladesh & World Bank

Design and Supervision Consultancy:

Development Design Consultants Ltd.

October-2020

Contents

1. INTRODUCTION 1

1.1 Project background 1

1.2 Elementary information of Work Package Component of W23.9 2

1.3 Proposed intervention items for this component 4

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS 4

2.1 Methodology 4

2.2 Important features/establishments within the PIA 5

2.3 Issues and Recommendations raised by the Participants 6

3. ENVIRONMENTAL SCREENING 7

3.1 General 7

3.2 Major Findings 7

3.3 Climate Change Impact Screening 10

3.3.1 General Overview of the area 10

3.3.2 Site Specific Screening and outcome 11

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) 12

4.1 General 12

4.2 Health and Safety Measure under COVID Situation 14

4.3 Cost of Environmental Enhancement Works in BOQ 15

5. LIMITATION OF THIS STUDY 15

6. CONCLUSION AND RECOMMENDATIONS 16

Annexure-01: Important Environmental Features (IEFs) near site 17

Annexure-02: Attendance of consultation meetings for W23/9 19

Annexure-03: Pictures of sub-project component location and surrounding features with public consultation 21

Appendix-1: Environmental Screening Form for examining sub-project component 22

Appendix-2: Environmental and Social Management Plan (ESMP) 40

Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.9 48

Appendix-4: Elephant Migration Routes Map 54

Appendix-5: Location Map of Sub-project component 55

ACRONYMS

BOQ	Bill of Quantities
BFS	Brick Flat Soiling
D&SC	Design and Supervision Consultant
DoE	Department of Environment
DRP	Displaced Rohingya people
EA	Environmental Assessment
EC	Electrical Conductivity
EMCRP	Emergency Multi-Sector Rohingya Crisis Response Project
ESMP	Environmental and Social Management Plan
ERP	Emergency Response Plan
ESMF	Environmental and Social Management Framework
FDMN	Forcibly Displaced Myanmar National
FGD	Focus Group Discussion
FSM	Faecal Sludge Management
GBV	Gender Based violence
GPS	Government Primary School
GRM	Grievance Redress Mechanism
HBB	Herring Bone Bond
IEFs	Important Environmental Features
ISCG	Inter Sector Coordination Group
IUCN	International Union for Conservation of Nature
IWM	Institute of Water Modeling
LGED	Local Government Engineering Department
PIA	Project Influence Area
PIU	Project Implementation Unit
PMU	Project Management Unit
PPE	Personal Protective Equipment
PSC	Project Steering Committee
SMC	School Management Committee
SPM	Suspended Particulate Matter
SWM	Solid Waste Management
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
UNHCR	The United Nations High Commissioner for Refugees
VAT	Value-Added Tax
WB	World Band

1. INTRODUCTION

1.1 Project background

An estimated 730,000[1] people of Rohingya community has fled to neighboring Cox's Bazar district of Bangladesh since August 25, 2017 to escape extreme violence in Rakhine State of Myanmar, which caused the total number of Forcibly Displaced Myanmar National (FDMN) in the district to be about 923,033[2]. This huge number of displaced population account for about one-third of the total population of Cox's bazar, a district which was already facing many development challenges and suffering from resource-constrained social service delivery system even before the crisis evolved and the mass exodus of FDMN has worsened the situation further. Almost all of these displaced people are hosted in Ukhiya and Teknaf Upazila of Cox's Bazar, in extremely congested settlements in areas having very minimal access to basic infrastructure and services and is prone to natural disasters. The Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP) has been designed in order to reduce the vulnerability of Forcibly Displaced Myanmar National (FDMN) along with people from the host communities in Teknaf and Ukhiya Upazila under Cox's Bazar District, to different disasters and improve the social service delivery system and disaster resilience to both the communities. This project will follow a sustainable development pathway that is resilient to disaster and climate change effects.

The objective of the Project is to provide greater protection for the FDMN and host communities through:

- Reducing the vulnerability to natural disasters
- Improving social service delivery system and providing better communication facility through physical interventions
- Improving water and sanitation facilities
- Reducing vulnerability to accidental fire
- Provisioning better educational facilities and
- Strengthening and scaling up of GBV prevention services to the FDMN

The project is jointly being implemented by Local Government Engineering Department (LGED), Department of Public Health Engineering (DPHE) and Ministry of Disaster Management and Relief (MoDMR) under their respective mandate and scope of works. Apart from the interventions in Addressing Gender and Social Inclusiveness and Preventing Gender Based Violence with the Support from UNFPA and building Communication and Awareness among all affected parties through an effective engagement of BCCP (Bangladesh Center for Communication Programs) in the areas, LGED is implementing a good number of infrastructural facilities, namely improvement of hat bazars, roads (both inside and outside of the camps), bridges, culverts, construction of School cum multi-purpose disaster shelters, Satellite Fire Stations, Relief Distribution Center, Community Service Center and many other different types of facilities. Given the project interventions, sensitivity of the areas and volume of people in or around the sites, the project is more likely to trigger certain Operational Policies and Bank Procedures, namely Environmental Assessment (OP/BP 4.01), Natural Habitat (OP/BP 4.04), Forest (OP/BP 4.36) and Physical Cultural Resources (OP /BP 4.11).

[1] ISCG: Situation Report Rohingya Refugee Crisis, (September 27, 2018)

[2] IOM Needs and Population Monitoring round 12 as of October 10, 2018

1.2 Elementary information of Work Package Component of W23.9

It is imperative to recognize proposed components under Work Package-23.9 in Ukhiya Upazila in order to assess and verify its interventions according to stipulated screening requisites from WB. Acknowledging this matter, such details are accounted for as given below in Table 1.2.1 along with visual presentation (General Upazila Map) given in Figure 1.2.1. Aerial map for this component is given in Appendix -5.

Table 0-1.2.1: Basic Featured Information of components [Sources of data: Field survey, 2020: DDC & LGED]

Component's name under W-23	GPS Coordinates	Distance from Upazila HQ	Union	Ward	Project Influence areas locations	Pre-existing condition of Road	Proposed Road type	Road dimension(m) (Length X Width) = Footprint (sq.m) *
Bottoli - Pukuria Road Id:422944060	**Starting Point** 21.25127^0 N 92.12986^0 E **Ending Point** 20.767606 N 92.317356 E	900m	Rajapalong & Ratnapalong	2, 5 & 6	West Shikdar, East Shikdar, Jamtoli, North Pukuria, South pukuria, Goyalmara	Partly HBB(Broken) & Earthen	Bituminous Carpeting (BC)	(2845mX4.9m) = 13,940.5 sq. m

*Note: Roads are proposed to have average carriage way of 3.7m with 0.6m shoulder on each side; special conditions may prompt further adjustments while in construction period. However, footprint for roads is calculated with an average of 4.9 meters.

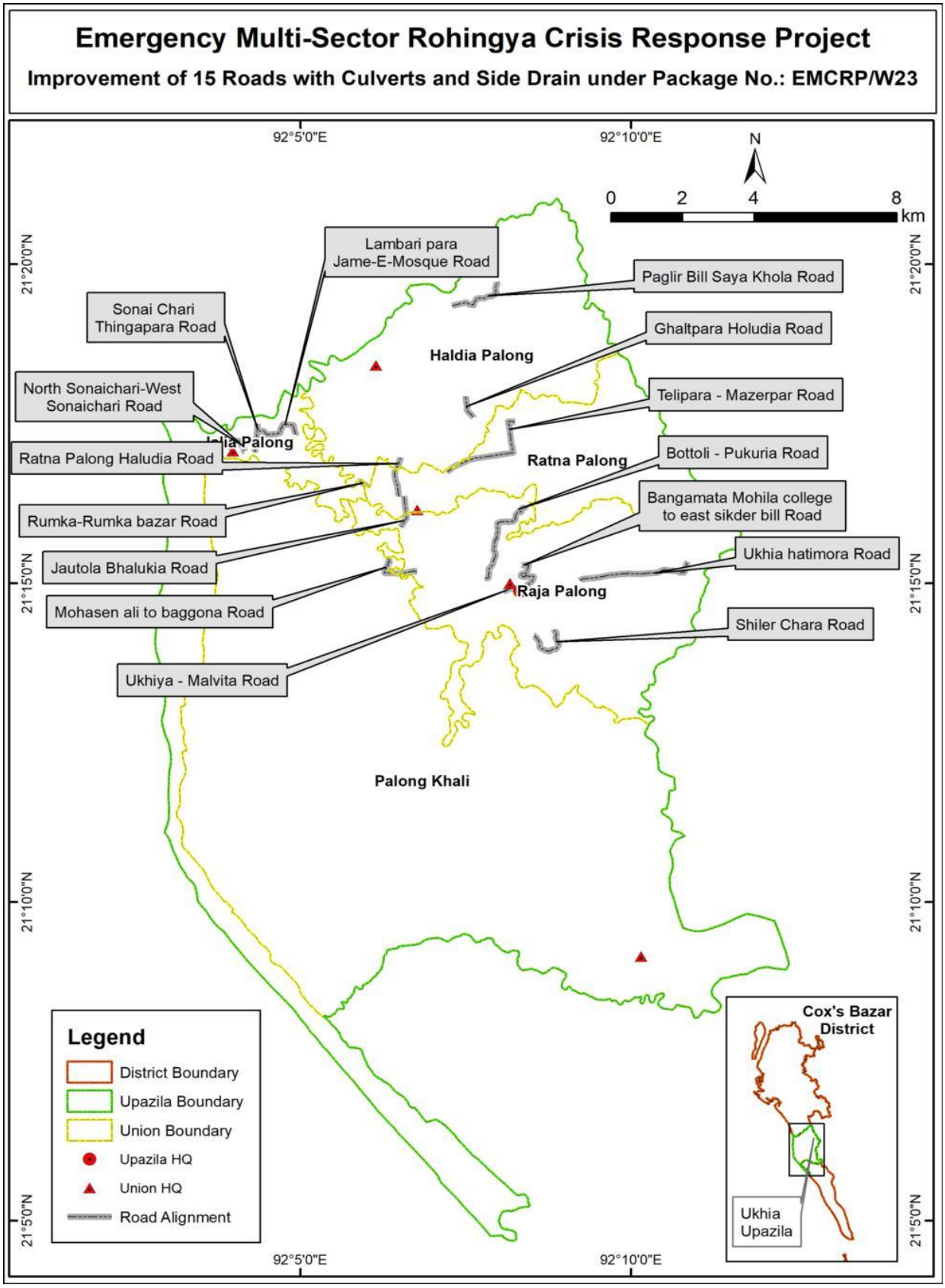


Figure 1.2.1: Map illustrating work package EMCRP/W23(9) location in the Ukhiya Upazila

1.3 Proposed intervention items for this component

The Bottoli - Pukuria Road(W23/9) under work package W23 have been proposed with specific need basis dimensions to accommodate and ensure best quality interventions for local stakeholders. In context of governing environmental circumstances and geo-meteorological conditions, protection work items have been added to construction design for safety and sustainability of each proposed roads. These roads are abutting agriculture hence, construction and improvement works will descent these roads into new circumstances in some parts. These items have been included on the basis of field survey and analysis of these conditions. Please follow the table to acknowledge these items.

Table 1.3.1: Proposed safety interventions of component

W23-9: Bottoly - Pukuria Road Id:422944060
01 nos. Cross Drain (dimension: 0.975mX 0.975m) at Ch. 1864.0m and **02 nos. Cross Drain** (dimension: 0.750mX 0.750m) at Ch. 391m, Ch. 530m, and **01 nos. Box Culverts** (dimension: 2.0mX2.0m) , **01 nos. Box Culverts** (dimension: 3.5mX3.5m), **381.0m RCC U-Drain** at different chainage, **198.0m L-Drain** at different chainage, **1067.0m Palisading wall** and **383.0m Toe wall**(105X2.0X2.5)**,** and **RCC Retaining wall** (105m X 5.0m) from ch:2662m to2682m**. Road safety** work and **Environmental Mitigation and Enhancement** works are also included. Description of safety works and environmental enhancement works can be found in BOQ attached in Appendix-03.

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS

2.1 Methodology

Public participation and community consultation have been taken up as an integral part of environmental assessment process of the project. As part of the impact assessment, participatory public consultation was conducted in areas of concern for proposed roads by the field level staffs and consultants from PIU and D&SC. The consultation meeting was attended by disparate social groups representing local habitants, separate age groups, social class and occupations. In some cases, IUCN employees in charge of elephant watch tower were present where frequent elephant movements occur. The participants were also selected from different segments of stakeholders, and some of whom will have major active roles before, during and even after the construction works. Therefore, the meeting was organized in an informed, expressive and unbiased manner, wherefrom different views and concerns came across which will be properly taken care of during the design and construction phases. In order to serve our screening process, relevant items were thrown towards the audience to discuss and troubleshoot confusing or worrying matters regarding the proposed intervention under package work. Impacts in regards to environment, socio-economic matters during pre-construction, construction and post construction phase have been put forth. Possible mitigation measures and relevant needs have turned out during these sessions as well. Moreover, their comprehension as a stakeholder has been up lifted in light of project guidelines.

However, public consultation is a living process as the types of problems/ difficulties, involved parties or stakeholders and mode of settlement or resolution processes are more likely to differ with time. Thus, consultation with different parties or stakeholders will be continued throughout the sub-

project implementation period and records of resolutions, whatsoever and wherever possible, will be kept in writing at the site and made available on any enquiries or requests by all parties concerned.

Most of the possible impacts under this component development have been put through review for locating impediments or possible adversity effecting future environment and socio-economic conditions. In order to comprehend surrounding features and impacts which may stipulate with it, screening has acknowledged having a Project Influence Area (PIA) of 0.5-kilometer radius. Sensitive findings have been identified if any, and relevant mitigation or minimization measures were suggested to subdue such complication for over the project construciton period. Moreover, evaluation was inspired to enhance environmental features and include monitoring initiatives under ESMP budget to ensure exertion of environmental improvement propositions. Contractor's responsibility has been taken into account while identifying possible impacts through sets of intervention accounts. These steps have been initiated strictly following ESMF guidelines and requirements. Environmental screening procedure was motivated by ingredients highlighted in Appendix-2 of ESMF. During survey, detail chainage length of the sub-projects was taken into account for detailing environmental and socio-cultural features within 100 meters buffer zone of both Left and Right side from the center line of the road. Longitudinal intervals of 300 meters have helped to identify positions of sensitive or near-sensitive socio-cutural features. These findings are illustrated in **Annexure-01**.

2.2 Important features/establishments within the PIA

Initial screening process is conducted through direct involvement of PIU and D&SC in the influence area of the proposed component, which allows to raise significant questions and ideas towards participants. In combination of both field walk-through and inputs of audience, a register of existing features is formed. Allow the following table to describe such elements in all the work package components.

Table 2.2.1: Important features within Project Influence Area for W23.9

Component's name under W-23	Direction	Important features/ establishment (approx. distance from the proposed site)
Bottoli - Pukuria Road Id:422944060	North	Graveyard(400m), South Pukuria Jame Mosque (800m), Shikdar Beel GPS (500m), Furkania Madrassa (800m), Moulovipara Jame Mosque (1km),
	South	Jamtoli Jame Mosque (30m), Ukhiya Sadar Hospital(500m), Rajapalong Madrassa(1km), Rajapalong GPS(1km), Balika madrassa(1km)
	East	West Shikdar beel jame mosque(500m), Graveyard(500m)
	West	North Pukuria GPS(1km), Clinic(1km), West Digulia Water Management Cooperative Association(250m), Goyalmara Jame Mosque(500m), North Pukuria Mosque(500m), Pukuria east jame Mosque(500m), Rice Mill(50m)

2.3 Issues and Recommendations raised by the Participants

After inauguration has set in motion, their valuable opinions and remarks came pouring out. At this point, we find our field base knowledge for assessment attributed impact degrees and possibilities. Please follow the table 2.3.1 given below to recognize participants' inputs arranged in relevance with this component. Consultation meeting summary, attendance sheets and pictures of separate meetings with proposed location for this subproject component can be found in Table 2.3.2 and Annexure-02 and Annexure-03 respectively.

Table 2.3.1: Issues and Recommendations raised by the Participants

COMPONENT'S NAME UNDER W-23.9	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
BOTTOLI - PUKURIA ROAD ID:422944060	• In Shikdar, Jamtoli and Pukuria area this proposed road is previously BC developed in first quarter however, rest of the road is in muddy lands and has earthen condition. This road has very unsettling conditions in some parts which makes the road risky for three wheelers to pass. • Big vehicles use this road but gets stuck where shoulders are broken badly. •Possible dust and noise pollution during the construction works. •Safety of children and adults at the sites during construction works. •Elephant movement not present. •Local community wish to have a better drainage system along with the road in order to allow waters from undulated terrains to find an uninterrupted pathway not causing harm to nearby households or agriculture fields and wash away top soil of adjacent grounds residing alongside the road. It will protect the top soil for future growth of crops and aid vegetable farming. •The participants have expressed their greater interest for this intervention and believes this will bring nothing but prosperity for the entire catchment dwellers. •Household fences along the road should not be affected while construction • No trees should be harmed for preparation of this road	•Local people considered that the selected site is suitable for the construction of this road from both the technical and social-environmental (Direct savings in the cost of operating vehicles, time savings by travelers and freight, wider effects can less accident rates, this road is waterproof and also dust free, much more durable) point of view. It will provide better mobility and access to services in due time. •The road should consider water flow during rainy seasons thereby ensuring the construction is not affected by mass water flow. •Enough pathway is expected for vehicle movement so that comfort travel is achieved. •Construction site safety should be ensured to avoid any mishaps or accidents during work periods. •They considered small lumbering and suggested tree plantation initiatives. •They also requested to involve the local community to construction work and they will welcome any outside key labor. •During construction period, alternate route to pass through this area is not available. •Since the road is passing alongside homestead gardens and agriculture fields, the intervention will invite air pollution on moderate level during construction period. However, preventive actions and measures can be taken to keep air quality from degrading. • Women should be recruited equally, wherever possible. •Participants, made certain that they will provide surveillance over raw materials and material storage area. •They have also ascertained that the selected site is free from any events related to resettlement and major environmental impacts. The adverse environmental impacts that may come in

COMPONENT'S NAME UNDER W-23.9	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
	• Available pathway to usher material delivering vehicles • Labor shed availability in the target location • Material storage is available	the way of air quality, noise, solid waste, occupational health & safety during the construction period, and will be of short duration, yet proper management/conservative options should be adopted. • Open space near sub-project side can be used as labor shed and material storage space. • Jhautola- West Goyalmara road is available for material delivery. • Electricity is available and contractor can install tube wells as deemed necessary.

Table 2.3.2: Consultation Meetings Summary

Road Package Number	Date DD-MM-YYYY	Venue	Main Participant Groups	No. of Participants	Remarks (If any)
W23-9	10-10-2020	Rafiq Store, Jamtoli Station	Host Community	33	---

3. ENVIRONMENTAL SCREENING

3.1 General

This section identifies the potential impacts that the various elements of the proposed Project may have on the physical, biological and socio-economic environment within half a kilometer of the radial distance around the site. Environmental Assessment (EA) based on this screening study for the Sub-project has been conducted to identify and determine which potential Project impacts may be significant and therefore require the application of reasonable and effective management and/or mitigation measures.

In order to realize the exact physical, biological, socio-economic and environmental impacts of the proposed sub-project sites and the influence area in regards to the implementation measures, an extensive field visit was carried out in each proposed sub-project PIA. Environmental Screening form, as adopted in **Appendix 2** of the Environmental and Social Management Framework of EMCRP, was administered for identifying the impacts and their extents.

The screening data and information for this subproject component and details screening summary have been formulated and shown in **Appendix-01.**

3.2 Major Findings

A complete view of current environmental conditions of individual sub-projects in relation to interested queries has been congregated in order to understand the degree of impacts

corresponding with marked interventions. Interestingly, most sub-project has correspondence with its surrounding features and upholds interchangeable impacts. However, the degree is not an interchangeable factor since scale is not parallel to each of these components which is where, mitigation measure differentiation is implied. There are some cases where unique circumstances have been met with while environmental screening took place which is also accounted for and should be a matter of concern for other parts of the ESMF initiative. The significant issues observed for this subproject component is enlisted in following Table 3.2.1 with pertaining impacts. Moreover, impacts that are adventitious has also been embraced for promoting best practices.

Table 3.2.1: Concerning environmental issues relating to each proposed subproject and influence area for W23.9

COMPONENT'S NAME UNDER W-23.9	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
BOTTOLI - PUKURIA ROAD ID:422944060	It is not located within any major environmentally sensitive area.	It will not cause any severe negative effects to the environmental settings of the area neither to important environmental features.
	Construction period will induce air pollution while preparing for bitumen and loading-unloading raw materials. Impacts on air quality during the construction phase may turn to negative. The main impacts include dust generation from crushers, vehicles and the transportation of all types of construction materials.	It will invite waste production which may in turn cause minor air pollution due to deposited dust and airborne particles less than PM_{10}. Dust pollution may slightly suffocate photosynthesis however this can be minimized through regular water sprinkling as suggested in ESMP.
	Noise emission from construction machineries and equipment can cause nuisance to local residents and workers.	The ambient noise level might have potential to increase temporarily and intermittently in the close vicinity of active construction fronts.
	No agriculture, fish farming and significant vegetation coverage is located in the ROW nor does it stand over such items. Nonetheless agriculture fields and homestead gardens/forest are found beside the road.	No agriculture land or any forest coverage will get degraded or lost for construction. Liquid waste such as left-over oils or chemicals might run into these adjacent features.
	Construction works will involve chemical usage and preparation of on-site add-ons to the road. Generating scraps and residues.	The runoff from work site may enter existing pond and frustrate the water quality which will be acute however.
	Few amounts of bush (sapling) will be cut down during construction phase at different chainage.	No severe damage will occur or damage to habitat will be faced. It can be managed by introducing small plantation incentives around the proposed location.
	Elephant Movement is not present in the vicinity of the subproject location.	No impact is expected
	No heavy earth excavation work will be involved.	Consequently air, noise and dust pollution will be occurred within a small-scale during construction period only.
	Construction related activities and setting up of labor camps along with associated facilities and their management can cause adverse impacts.	Noise pollution from pilling or drilling, air pollution caused by dust or gaseous emissions from vehicle movement, running of motorized equipment and

COMPONENT'S NAME UNDER W-23.9	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
		land clearing, odors and soil pollution from leaking of latrines and fecal sludge, will more likely to take place.
	Chemical spills or improper disposal of construction waste materials due to lack of worker training and misconduct of contractor's safety initiatives.	During the construction period, soil may get contaminated from activities such as handling of hazardous construction materials (such as fuel, lubricants, paints, and solid waste and sewage).
	Vibration effects generated from pilling, drilling or other construction works	Any vibration would result in nuisance effects to nearby faunal species, and but will be localized and temporary and will unlikely to result in structural damages to buildings or walls of the adjacent private properties.
	Sensitive environmental, cultural, archaeological, religious sites within 1 kilometer of site includes including Graveyard(400m), South Pukuria Jame Mosque (800m), Shikdar Beel GPS (500m), Furkania Madrassa (800m), Moulovipara Jame Mosque (1km) to the North. Jamtoli Jame Mosque (30m), Ukhiya Sadar Hospital(500m), Rajapalong Madrassa(1km), Rajapalong GPS(1km), Balika madrassa(1km) to the south. West Shikdar beel jame mosque(500m), Graveyard(500m) to the east and North Pukuria GPS(1km), Clinic(1km), West Digulia Water Management Cooperative Association(250m), Goyalmara Jame Mosque(500m), North Pukuria Mosque(500m), Pukuria east jame Mosque(500m), Rice Mill(50m) to the west.	No disturbance to all these establishments/features is anticipated due to construction activities for the sufficient distance from the construction site, and strict construction site management system- including restrictive work schedule during the daytime only, water-sprinkling twice a day on and around the site, safe storage of materials, etc.

A few incidents of human elephant conflict have been reported in 2018. The IUCN has conducted a study on such conflict. With the support from UNHCR, IUCN has been marking elephant routs and corridors and informing local communities and stakeholders of avoiding the marked areas. As part of the mitigation options, different initiatives have been undertaken, such as formation and capacity development of Elephant Response Teams (ERTs); providing equipment to ERTs to divert in-coming elephants; and setting up elephant deterrent tools (e.g. trip alarms and watch-towers). Though the current chances of occurrence of conflicting incidence are zero, any recurrence would be managed by the ERTs and they will be called if there appears any minute possibility to recur. A map of elephant movement is given in Annexure 04.

In order to offset the loss or attenuating the environmental degradation, a set of mitigation measures will be adopted, on top of general practice of standard construction procedure or following the relevant codes of practices.

3.3 Climate Change Impact Screening

3.3.1 General Overview of the area

Cox's Bazar is one of the coastal districts of Bangladesh and is prone to the effects of climate change due to its geomorphological siting and climate induced effects. The hilly tracts of Cox's Bazar could foster further environmental crisis brought on by indiscriminate deforestation and diminishing groundwater reservoirs, which have been taken place in recent months as the Rohingya crisis evolved. A recent study conducted by World Bank[3] has found that Cox's Bazar will be the worst-hit district in South Asia as average temperatures rise and rainfall patterns become disruptive, by 2050, if greenhouse gas emissions continue unabated.

The hilly region of the country, especially the part in Cox's Bazar is characteristically of muddy soil structure, not of any rocky formation and the stability comes from the roots of the trees. Also rainfall, proximity to the sea, elevation, and land cover are very important factors for analyzing the risk of cyclone. Denudation of trees from hilltops in order for the huge settlement of Rohingya people has already increased the vulnerability to the risk of hill collapse by destabilizing the terrain. Also deforestation at a rapid speed uncovers the land and raise the risk of occurrence of cyclones, as forests protect land from high wind and storm surges where demolishing the trees would make the area vulnerable.

Together with the above-mentioned hazardous situation, again due to sudden extraction of huge amount of groundwater, availability of potable water from shallow tube wells that pump water up from about 150 feet has already reached to a critical level. Averting the problem requires new tube wells to be plumbing deeper into the poorly mapped aquifer, but going deeper than 700 feet in some places may cause salt water to contaminate freshwater resources.

In this case, it is possible that a stationary position of the freshwater-saltwater transition zone can be established via proper management of pumping in the confined aquifer.

The groundwater resource is seen to suffer more from the climate change impact. The impact on groundwater due to climate change impact include

- Sea-level rise could result in a transgression of the sea and a loss of land area. This could also lead to the secondary effect of population migration in the new coastal band due to migration of the coastal population from the encroaching sea, thereby increasing domestic water needs in the new coastal area.

- Transgression of the coast implies that saline storm surges of 1 or more meters depth would penetrate beyond the new coast to new land areas. Storm surges transport saline water far inland of the coast and much of this floodwater may infiltrate the ground in areas where the aquifer is not fully saturated. Even where the aquifer is saturated, denser saline water may

[3] https://openknowledge.worldbank.org/bitstream/handle/10986/28723/9781464811555.pdf

sink into the aquifer during the flood and later from pools of saltwater that remain following the flood[4].

- It has been identified that the salinity is found in the shallow aquifers along the coastline. So the salinity which are found in the groundwater are of lesser concern as salinity will subside over time

- Several researches show that through modeling of groundwater flow that the depletion of groundwater in the host community will persist up until 2022 and the replenishment of water will take place.

Considering the general climate change effects in Cox's Bazar area and offsetting the aggravating environmental situation due to the mass arrival of Rohingya communities, several specific measures including tree planation in sub-project areas, rainwater harvesting from every disaster shelter, construction of drainage facilities along the road length and installing thunder arrester across the areas, have been suggested and will be implemented.

3.3.2 Site Specific Screening and outcome

Climate Change impact on a particular subproject is tough to deduce as the highest resolution of climate model simulation done over Bangladesh is 50km. Depending on the simulation ensemble of Cox's Bazar district, the temperature and precipitation are likely to increase with time.

Site specific climate change impacts are often not so easy to measure or deduce plausibly while the site is confined to a narrow strip of roadways, and associated mitigation or offsetting measures are really hard to plot on the impact areas, though an overall set of measures are often considered in practical aspect. Fig:1 shows the inundation risk map of the subprojects under W-23, none of the subprojects are in vicinity of the severe river flood inundation area. So the risk of flooding is low around the sub-project area

[4] "Implications of Climate Change for Fresh Groundwater Resources in Coastal Aquifers in Bangladesh", World Bank report.2010

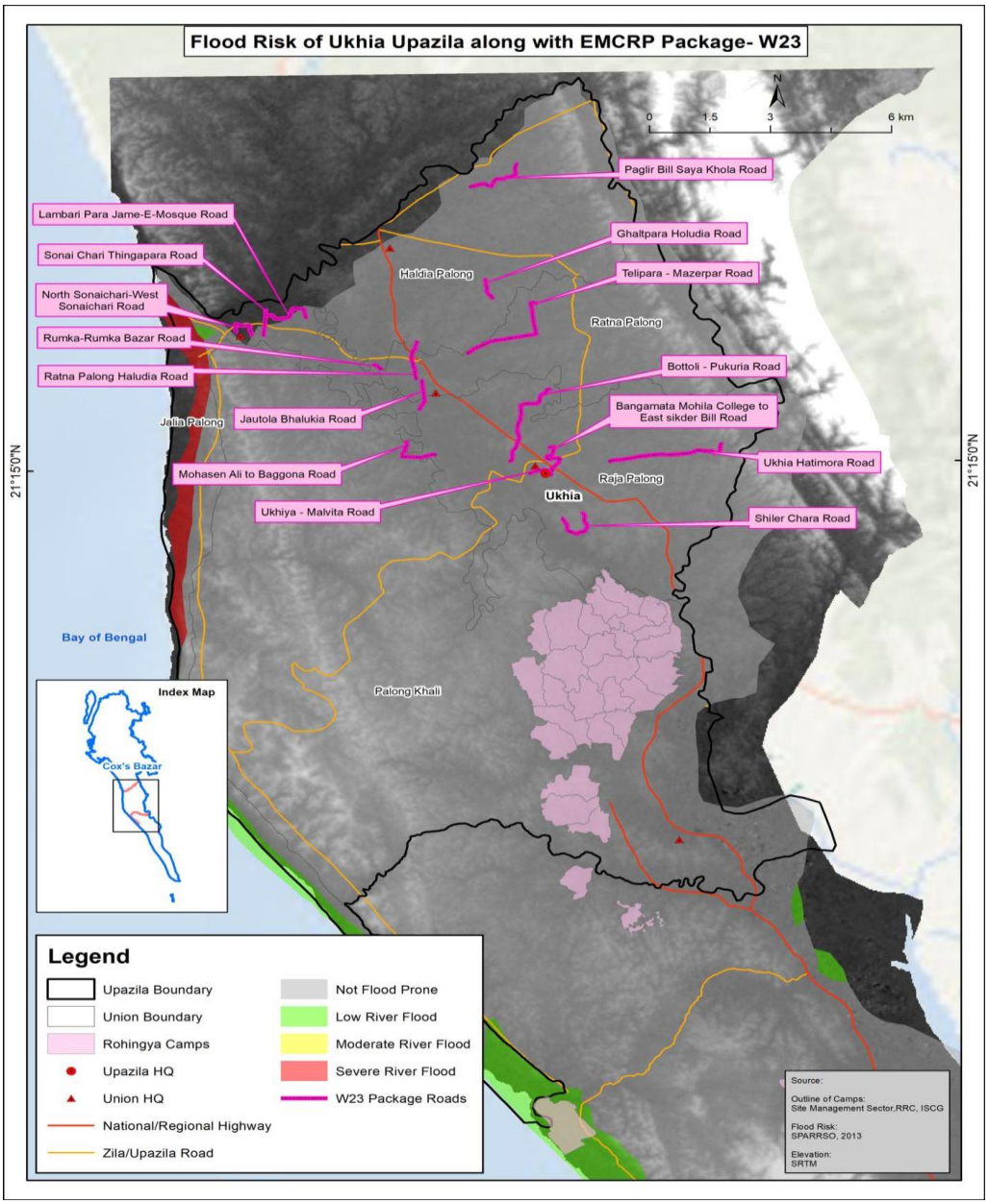


Figure 3.3.2.1: Flood inundation risk map near the subprojects.

Also, in order to avoid the devastation caused by the thunderstorm, state-of the-art thunder arrester (lightning protection system) has been suggested to install having a coverage area of 25,434 sq.m for a single arrester. In addition, tree planation on the road slope/ within the premises is also suggested to sooth the temperature effect and increase the water retaining capacity of soil, at the same time.

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

4.1 General

Considering the environmental settings of the sub-project area, it can be assumed that possible impacts would be largely construction-related, and could be addressed through adoption of good engineering practices; good housekeeping; better *in-situ* construction materials management; and observance of health and safety protocols during the implementation period.

Table 4.1.1: Site Specific Impact and Mitigation Plan under package W23.9

Component's name under W-23.9	Impacts	Mitigation plan
Bottoli - Pukuria Road Id:422944060	To the south Jamtoli Jame Mosque (30m). There are settlements as shops and households are located adjacent to the sub-project which can be subject to air pollution. However, none are on the ROW.	Contractor must adhere to the best practice debris management procedure and regular adoption of dust control measures (spraying of water at least twice a day) to minimize the effect to the level best.
	Some part of the proposed road is passing by the agricultural land. **Box culvert** and **cross drain** will be constructed to terminate rainwater for one side to another side during rainy season and also help for rapidly remove excess soil water to reduce or eliminate waterlogging during monsoon and return soils to their natural field capacity and will help to maintain the water balance of both roadside agricultural land to provide a sustainable irrigated agricultural system. It will also help to prevent flood and not to allow water to overflow and also help to divert water for farming. Some high land is found beside the road. So, **L-Drain** will be constructed for drainage high land eel water during rainy season. **U-drain** is also considered for drainage facility that runs along the road for uninterrupted water flow. Some low land is found beside the proposed road so **protection wall** and **palisading work** will be constructed during construction period for used to "correct" the natural slope. There are points on the road where slope preparation cannot be done due to having low lying agriculture lands and water bodies. Slope preparation refers to resettlement issues as well in those locations. In such cases **Toe Wall** is proposed which helps to restrain the horizontal surface pressure. This is an adaptation technique and a precaution measure to not allow any damage to sideline existing low-lying features. There are low lands along the road where agriculture fields and ponds are present. This also excludes high chance of soil quality degradation. Some high land is found beside the road where **Retaining wall** will be constructed to avoid landslips and soil erosion.	**01 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 1864.0m and **02 nos. Cross Drain** (dimension: 0.750mX 0.750m) at Ch. 391m, Ch. 530m, and **01 nos. Box Culverts** (dimension: 2.0mX2.0m) , **01 nos. Box Culverts** (dimension: 3.5mX3.5m), **381.0m RCC U-Drain** at different chainage, **198.0m L-Drain** at different chainage, **1067.0m Palisading wall** and **383.0m Toe wall**(105X2.0X2.5)**,** and **RCC Retaining wall** (105m X 5.0m) from ch:2662m to2682m**. Road safety** work and **Environmental Mitigation and Enhancement** works are also included.

Further construction related activities which may result in adverse impacts in the surrounding environment of the sub project component must be kept under close consideration and appropriate mitigation and management measures will be taken with due care and vigilance. Once the effects are minimized to its least level and controlled efficiently, it will turn into a welcoming and beneficial project for the local communities. The component specific environmental management plans have been outlined in **Appendix-2**. The mitigation measures as well as monitoring program of ESMP have also been incorporated in the management plan.

Environmental quality enhancement: Under the additional financing to the EMCRP project, Forest Department of the Government of Bangladesh will afforest along 200 km of road length area, primarily under the Ukhiya and Teknaf Upazila of Cox's Bazar district in order to offset the environmental and ecological devastation, that had been occurred due to the evolution of Rohingya Crisis, to an achievable level. Many of these road lengths will go through and by the Rohingya Camps, up on the hill and are already denuded of trees or vegetation. Local Government Engineering Department (LGED) will allocate and channelize the finance to the Forest Department under the said additional financing component and oversee the progress of works with due diligence. However, this enhancement work will improve the environmental quality of the area and reinstate some parts of the ecosystem services to those areas, though primarily.

4.2 Health and Safety Measure under COVID Situation

Apart from the established Occupational Health and Safety (OHS) measures being followed in construction sites, offices, and labor camps, a set of additional measures has to be taken and practiced throughout the daily cycle by each labor, staff and any involved parties, due to the ongoing pandemic coronavirus situation. Staffs and consultants at PIU and D&S, along with the pool of consultants under different firms/agencies for different services, and all the representatives or staffs of construction contractors and suppliers have to play much sensitive, (pro-) active and responsible roles in abiding by the rules and measures by themselves and getting the involved workers and different stakeholders adhered to the same. A detailed guideline containing a set of measures with shared responsibilities has been sketched out in order to fight the exposure and further spread of this potentially fatal situation. This plan or guideline shall constitute an integral part of ESMP measures for every sub-project, though is not included in this report to keep it concise and specific, and the contractor is required to keep the copy of that guideline at every site office.

However, among many other relevant issues, the guidelines emphasize on following line of directives:

a. Contractor must designate one of his employees as H&S/Safeguards supervisor to lead, coordinate and interface in order to fight the COVID 19 situation under the direct guidance of COVID focal at PIU of EMCRP project.
b. All workers, supervising and supporting engineers and staffs, consultants, service providers and other concerned parties must adhere to the personal health and hygiene rules, social distancing, and other protective measures in full in order to protect themselves and contain the infections any further. Necessary training and awareness campaign will be aligned with the specific sub-project scenario and prevailing conditions.

c. General practice of cleaning and hygiene has to be maintained in all project/site offices and camp sites, and supply of necessary PPEs and cleaning /disinfecting materials along with proper use of those is to be ensured.
d. Public consultation and stakeholder engagement are to be carried out considering the prevailing risks of virus transmission in the target areas, scope of interventions and level of ICT penetrations among the target stakeholders, and so on.
e. Necessary protocols have to be established and maintained in case of handling a sick employee or worker, and appropriate compensation to a sick disengaged labor is required to be given with due documentation.
f. Budgeting for suggested protective measures, along with necessary supervision and monitoring for the required interventions has to be ensured.

Following the additional health and safety measures presented in that guideline, sub-project component specific BOQ items have been inserted to supplement the budget considering the country-specific situation, capacities, and scope of interventions. The additional cost to Health and Safety Measures under COVID 19 situation is shown in **Appendix-3.**

4.3 Cost of Environmental Enhancement Works in BOQ

In consideration to the above-mentioned environmental impacts and their mitigation measures for this sub-project component, a set of items are included in the BOQ of this sub-project component. Social Safeguard Personnel for Environmental and Social Management for Work Package EMCRP/W23 has also been added in the whole BOQ in order to take supervision and leadership to organize Environmental Management under Environmental Enhancement Works. The total costing and estimation have included enhancements such as Grass turfing plans, Tree plantation initiatives, Dust Suppression mechanisms. On the other hand, in order to ensure health safety and sanitary measures of workers PPE, First Aid Box, Labor shed, Environmental management, drinking water facility with water tests, Temporary latrine for both male and female as well as waste disposal systems has been accounted for. Ensuring sustainable labor performance in regards to environmental and social considerations motivational training has been taken into account. An overview of the estimation is given below and the detailed estimated cost to implement the ESMP is shown in **Appendix-3**.

5. LIMITATION OF THIS STUDY

Bangladesh government has imposed a nationwide lockdown to curb the spread of the novel coronavirus in the wake of series of deaths and infections. Authorities declared a ban on passenger travel on all sector from March 24 while all public transport on roads have been suspended from March 26 to stem the spread of virus, officially known as COVID-19. All office works have been postponed and an intended visit to the sites for further consultation with the relevant stakeholders has had to cancel due to this crisis. Therefore, some relevant information and arrangement needs waiting for recovering this pandemic crisis.

6. CONCLUSION AND RECOMMENDATIONS

The overall conclusion is that if the mitigation, compensation and enhancement measures are implemented in full, there will be no significant negative environmental impacts in regards to the selection of location, design, construction, and/or operation procedure of the proposed component. There will in fact be tremendous benefits from recommended mitigation and enhancement measures and major improvements in quality of life, opportunities in business, trading jobs and ensuring social safety and security will be achieved once the scheme is in operation.

The conclusions of the Screening study can be summarized as follows:

- The communities will receive large benefits through improved infrastructural facilities, transportation & communication etc.
- The short-term negative impacts that may come by the way of air quality, noise, solid waste, occupational health & safety need to be minimized through the management plan.
- The project will create employment for those who live in the vicinity of the construction site and will provide them a short-term economic gain.
- The green belt development, if necessary, for the road site, with large-growing trees at the periphery of the site will give the places a more natural and pleasing appearance.
- A comprehensive Environmental and Social Management Plan (ESMP) has been prepared to mitigate and reduce the adverse impacts that will come out from the Subproject activities.

Implementation of this component will have large positive impacts to the communities in terms of improved infrastructural transportation & communication facilities, which would eventually develop the socio-economic condition of the catchment areas. So, strong recommendation should be put in place to implement the sub-project within shortest possible period of time, and with great care and efficiency.

Annexure-01: Important Environmental Features (IEFs) near site

Detail Environmental features within 100m of the both sides from the center line were collected @300m longitudinal intervals. The findings of the survey for the aforementioned road can be seen in the table below:

Table: Detailed Chainage length and features of the Sub-Project component

Road Name	Bottoli - Pukuria Road Id:422944060 **(W23-9)**		**Total Chainage**	2845.0m
Chainage (m)	**Left**	**Right**	**Features**	
000-300	L		Guide wall, trees, electric pole, mosque, tila, bamboo bush on hill, tin shed fence.	
		R	Earthen household, wired fence, trees, uttar pukuria connecting road, brick boundary wall, bamboo fence.	
300-600	L		Tin shed fence, tila, big trees on the hilly areas, tin shed household, bamboo fence, tree, household, shop, electric pole, bamboo fence, big tree, brick boundary wall.	
		R	Protection wall, tin shed fence, tree, tin shed household, bamboo fence, bamboo bush, household.	
600-900	L		Bamboo bush, tila, tree, tin shed household, mosque, shop, bamboo fence, big tree, culvert, u-drain.	
		R	Wire fence, tin shed fence, household, small trees, trees on tila, household on tila, bamboo fence, electric pole, shop, tin shed garage, shop, household, Jamtoli Iahfijul Quran Madrasha & Hefjokhana, culvert, pillar.	
900-1200	L		Bamboo fence, big tree, u drain, building, culvert, tree garden, big tree, bamboo fence, rubber dam on side of the bridge, tree bushes.	
		R	Trees, household, tree garden, bridge, West Digulia water Management Somity, bushes, culvert.	
1200-1500	L		Tree garden, vegetables land, household, pond, bamboo fence, big tree, trees, household.	
		R	Trees, household, tin shed shop, trees, vegetables land, bamboo fence, big tree, household, trees.	
1500-1800	L		Tree garden, big tree, bamboo fence, big tree, bamboo fence, bamboo bush, tin shed fence, open grounds, bush, crop field, trees, open space	
		R	Tree garden, electric pole, crop field, electric pole, Crop field, bush bamboo fence, crop field, tree garden,	
1800-2100	L		Settlement, bamboo fence, small tree bush, trees, bamboo fence, tin fence, electric pole, bamboo fence, tree garden, bamboo bush, settlements, tin fence, earthen households, shop	
		R	Crop field, electric pole, crop field, Electric pole, big trees,	
2100-2400	L		Crop field, pond, bamboo fence, crop field, open space, household connecting road to the left, tree garden,	
		R	shop, bamboo fence, tree garden, mosque, Crop field, brick wall, guide wall, settlement,	

2400-2845	L		crop field, small tree, electric pole, crop field, bamboo fence, electric pole, tree garden, shop, tree, Bush, trees, bush, trees,
		R	household connecting road to the right, brick wall, mosque, culvert, crop, Crop field, trees,

Annexure-02: Attendance of consultation meetings for W23/9

EMCRP/W23.9

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)

জরুরী ভিত্তিতে রোহিঙ্গা সংকট মোকাবেলায় বহুখী সেক্টর প্রকল্প

Local Government Engineering Department (LGED)

Public Consultation Participants List

Focus Group Discussion

সময়: 8:30 PM তারিখ: ১০.১০.২০২০

উপজেলা/মেট্রোপলিটন এর নাম: হতেমী - পুকুরিয়া রোড

যে বিষয়ে মূল: দক্ষিণ পুকুরিয়া কমিউনিটি সেন্টার, দক্ষিণ পুকুরিয়া।

ইউনিয়ন: রাজাপালং ওয়ার্ড নং: ০২/০৫ মৌজা: পুকুরিয়া উপজেলা: উখিয়া জেলা: কক্সবাজার

সাব প্রজেক্ট নং: EMCRP/W23·9

অংশগ্রহণকারীদের তালিকা (পরিচয় ও স্বাক্ষর)

ক্রম নং	নাম	বয়স	পুরুষ/মহিলা	গ্রাম	স্বাক্ষর / টিপসই
১	আবদুল হোসেন মুনসি	৬২	পুঃ	দক্ষিণ পুকুরিয়া	
২	দেলোয়ার হোসেন	৬৬	ম	দক্ষিণ পুকুরিয়া	
৩	ইমরান নাজিম	৬২	ম	ম	
৪	কবির আহম্মদ	৬২	ম	দক্ষিণ পুকুরিয়া	
৫	প্রভাষক শশি	৩৮	ম	সিকদার বিল	
৬	আবু তাহের	৪৫	ম	দঃ পুকুরিয়া	
৭	নোরশুনী নন্দী	৪৬	ম	সিকদার বিল	
৮	ফরিদ আলম	৩৫	ম	ম	
৯	মোঃ মিরাজ	৩৩	ম	ম	
১০	আবদুল ফরিদ	২৮	ম	দক্ষিণ পুকুরিয়া	
১১	মোঃ রাসেল	২৬	ম	ম	
১২	মোঃ সাইফাহমদ	৫১	ম	ম	
১৩	মোঃ ইয়াকুব	৩৭	ম	ম	
১৪	মোঃ ফারুক	২০	ম	ম	
১৫	মোঃ হাশেম	২৬	ম	দক্ষিণ সিকদার বিল	
১৬	মোঃ নুরুল আলম	৩৯	ম	দক্ষিণ পুকুরিয়া	
১৭	মোঃ জসিম	৪৫	ম	ম	
১৮	আহম্মদ কবির	৩৫	ম	দক্ষিণ পুকুরিয়া	

EMCRP/W23.9

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)

জরুরী ভিত্তিতে রোহিঙ্গা সংকট মোকাবেলায় বহুখী সেক্টর প্রকল্প

Local Government Engineering Department (LGED)

Public Consultation Participants List

Focus Group Discussion

সময়: ০৫:২০ PM তারিখ: ২০/১০/২০২০

উপ-প্রকল্প/কার্যক্রমের নাম: রইচঙ্গী - ঝুকুরিয়া রোড।

সভা বিষয়ের স্থান: আব্দিন মেম্বার, হারবাঙ্গা।

ইউনিয়ন: রাজুখালী ওয়ার্ড নং: ০৫ মৌজা: উখিয়া উপজেলা: উখিয়া জেলা: কক্সবাজার

সাব প্যাকেজ নং: EMCRP/W23.9

অংশগ্রহণকারীদের হাজিরা (পরিচয় ও স্বাক্ষর)

ক্রম নং	নাম	বয়স	পুরুষ/মহিলা	গ্রাম	স্বাক্ষর / টিপসই
১৯	মোহাম্মদ নূর	২৬	পুরুষ	রইচঙ্গী-	
২০	মোঃ আবদুল আজিজ	৭৪	"	মৌলভীপাড়া	আজিজ
২১	মোছাম্মৎ আক্তার	২৯	মহিলা	হারবাঙ্গী	
২২	নূর আলম	৩৭	"	"	
২৩	সালমান নাহার	২৫	"	"	
২৪	মোকদ্দছা	২০	"	"	
২৫	ফরিদা আক্তার	৩০	"	"	
২৬	নূর নাহার	৩৮	"	"	
২৭	হাসিনা	৩৫	"	"	
২৮	মুর্শিদা	২৯	"	"	
২৯	আবদুল নাহার	৩৮	"	"	
৩০	মমতাজ	৩০	"	"	
৩১	আমেনা	২৫	"	"	
৩২	আয়েশা বেগম	৩৪	"	"	
৩৩	ফরিদা বেগম	৩৮	"	"	

Figure: Attendance of consultation meeting for W23-9

Annexure-03: Pictures of sub-project component location and surrounding features with public consultation













Figures: Present condition of Bottoli - Pukuria Road (W23-9) & Public Consultation meeting with Host community

Appendix-1: Environmental Screening Form for examining sub-project component
Environmental Screening Form for Sub-project W23-9

Sub-Project Description Form:

EMCRP/W23- Improvement of 15 roads and construction of culverts with side drains under Cox's Bazar District

Name of Sub-Project: Bottoli - Pukuria Road Id:422944060

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Estimated total cost of sub-project (in Taka): 417,036,298.10 Tk.

Estimated construction period duration: 1 year

Estimated total cost of the component (in Taka): **67,392,984.80 Tk.**

Estimated Operation and Maintenance period (life of sub-project): Project design life more than 15 (Fifteen) years but Government policies on how long projects can operate in the camps.

District: Cox's Bazar **Sub-District**: Ukhiya **Union**: Rajapalong and Ratnapalong

Name of Community/Local Area: West Shikdar, East Shikdar, Jamtoli, North Pukuria, South pukuria, Goyalmara

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):
The Sub-Project is categorized as a village road-A with a proposed design of Bituminous Carpeting through construction of Earth Work. Interventions include **01 nos. Cross Drain (dimension: 0.975mX 0.975m)** at Ch. 1864.0m and **02 nos. Cross Drain (dimension: 0.750mX 0.750m)** at Ch. 391m, Ch. 530m, and **01 nos. Box Culverts (dimension: 2.0mX2.0m) , 01 nos. Box Culverts (dimension: 3.5mX3.5m), 381.0m RCC U-Drain** at different chainage**, 198.0m L-Drain** at different chainage**, 1067.0m Palisading wall and 383.0m Toe wall(105X2.0X2.5),** and **RCC Retaining wall (105m X 5.0m)** from ch:2662m to2682m. **Road safety** work and **Environmental Mitigation and Enhancement** works are also included. Road safety works are also included in the project activity.

Estimated footprint / land area for this sub-project is 13,940.5 sq. meter

Brief description of sub-project site: (e.g. present land use, Important Environmental Features (IEFs) near site, etc.:

Proposed road is situated within the catchment area of West Shikdar, East Shikdar, Jamtoli, North Pukuria, South pukuria, Goyalmara stretching 2845 meters. This road starts from Cox's Bazar-Teknaf highway and ends in Jhautola Goyalmara road. Being one of the local communities of Ukhia upazila these locations are very familiar to any other part of rural Bangladesh having mosques, village households, agriculture fields to grow crops and vegetation that serves as subsistent gardening. The surrounding area is dominated with agriculture practices as rice production, betel leaf production, vegetable farming etc. Majority of the surrounding space of this intervention is covered with

homestead gardens and forests. However, there are no significant eco-sensitive features on the pathway of this proposed road.

Overall Comments

The proposed component of the sub-project (Road construction) is not located within any remarkable environmentally sensitive area and will not cause any severe affect to the environmental settings of the area, thus not going to create intimidation to important environmental features. No drainage congestion/water loggings have been observed in the road area. But, some local trees like betel nut tree, rain tree, mango tree, bamboo bushes etc., or additional vegetation may need to clear out due to construction activities, with appropriate offsetting measures to be taken. No agricultural productive soil will be used for the purpose. Earth will be compacted for stabilization. The inputs will be mainly at construction phase and limited within project boundary. Moreover, mitigation measures will be taken according to the ESMP for minimizing the air, dust and noise pollution.

It has been revealed that this project's scopes of works do not intend to overtake their area of lodgment and funding entity has no intention to do so. Moreover, other issue has also been brought to their attention that drainage system and a bridge have also been included into the evaluation of this project since runoff from higher grounds are also a concerning matter during rainy season.

People of the subproject area are very much optimistic about the success of the project and are also eager to participate in the project activities. The subproject is environmentally sustainable and socially acceptable. The local community attended in the participatory public consultation meeting. Their community representatives as teachers, shop owners, farmers and elders have no objection to the construction this infrastructure in the proposed site; the community also appreciated the initiative of LGED to ensure safe access and better portability. The public consultation meeting results confirmed that improvement of this road will increase socio-economic interest in the communities and make lives easier for these people. They also requested to construct the road in accessible width so that small auto and motor vehicles can pass easily. On another matter, locals requested to involve the local community to construction works and material storage monitoring duties.

The road is not located within any identified environmentally sensitive area, and therefore, does not seem to cause any adverse impact on the important environmental features. No significant impact is expected on the ecosystem and biodiversity, no agricultural land/ activities or fish farming will be disturbed, due to the construction of the sub projects. Only forest is found as homestead forest on high grounds of the location.

Types of waste to be generated during construction and operation phase:
During construction period solid waste will be generated due to construction activities. The types of wastes are brick pit, unused sand, wood, gravels, bitumen etc. The types of wastes are gravel, stones, rock, wood, copper wires, concrete, iron, plastic etc. Negligible amount of plastic will come as residue. Moreover, liquid waste will include chemicals of bitumen leftovers, motor oils, used oil, Degreasing solvents etc. Human wastes and kitchen wastes will be generated from labor camps as well.

Sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site including elephant migration routes and remaining forests:

Within the influence area of the subproject no historical sites were identified. Sensitive environmental, cultural, archaeological, religious sites within 1 kilometer of site includes including Graveyard(400m), South Pukuria Jame Mosque (800m), Shikdar Beel GPS (500m), Furkania Madrassa (800m), Moulovipara Jame Mosque (1km) to the North. Jamtoli Jame Mosque (30m), Ukhiya Sadar Hospital(500m), Rajapalong Madrassa(1km), Rajapalong GPS(1km), Balika madrassa(1km) to the south. West Shikdar beel jame mosque(500m), Graveyard(500m) to the east and North Pukuria GPS(1km), Clinic(1km), West Digulia Water Management Cooperative Association(250m), Goyalmara Jame Mosque(500m), North Pukuria Mosque(500m), Pukuria east jame Mosque(500m), Rice Mill(50m) to the west. Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists.

Mostly human settlements are found around the sub-project area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). Elephant migration routes were about 5-6 km away from this sub-project. No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below

Section A: Sub-Project Overview

Description of sub-project/component interventions:

This intervention will include the following items;

- **01 nos. Cross Drain (dimension: 0.975mX 0.975m)** at Ch. 1864.0m
- **02 nos. Cross Drain (dimension: 0.750mX 0.750m)** at Ch. 391m, Ch. 530m,
- **01 nos. Box Culverts (dimension: 2.0mX2.0m)**
- **01 nos. Box Culverts (dimension: 3.5mX3.5m)**
- **381.0m RCC U-Drain** at different chainage
- **198.0m L-Drain** at different chainage
- **1067.0m Palisading wall**
- **383.0m Toe wall (105X2.0X2.5)**
- **RCC Retaining wall (105m X 5.0m)** from ch:2662m to2682m.
- **Road safety** work and **Environmental Mitigation and Enhancement** works are also included (description of such items can be found in BOQ)

Sub-project Location:

Important Features	
ID	422944060
District	Cox's Bazar
Upazila	Ukhiya
Union	Rajapalong and Ratnapalong
WARD	05,02 and 06
Proposed Chainage	2845m
Road Type	Village Road-A
Proposed Intervention Type	BC

Distance from Upazila HQ	01km
Road Starting Point Coordinates and name	Latitude: 21.251270 N Longitude: 92.129860 E Road starts from Cox's Bazar-Teknaf Highway
Road Ending Point Coordinates and name	Latitude: *20.767606 N* Longitude: *92.317356 E* Ends in Jhautola-Goyalmara Road

Land ownership
Government Land

Expected construction period: 1 Year

Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water bodies, etc. and historical or socio-cultural assets): Please also explain any analysis on alternative location was conducted:

Graveyard(400m), South Pukuria Jame Mosque (800m), Shikdar Beel GPS (500m), Furkania Madrassa (800m), Moulovipara Jame Mosque (1km) to the North. Jamtoli Jame Mosque (30m), Ukhiya Sadar Hospital(500m), Rajapalong Madrassa(1km), Rajapalong GPS(1km), Balika madrassa(1km) to the south. West Shikdar beel jame mosque(500m), Graveyard(500m) to the east and North Pukuria GPS(1km), Clinic(1km), West Digulia Water Management Cooperative Association(250m), Goyalmara Jame Mosque(500m), North Pukuria Mosque(500m), Pukuria east jame Mosque(500m), Rice Mill(50m) to the west. Within the influence area of the subproject no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (checked with local IUCN representative).

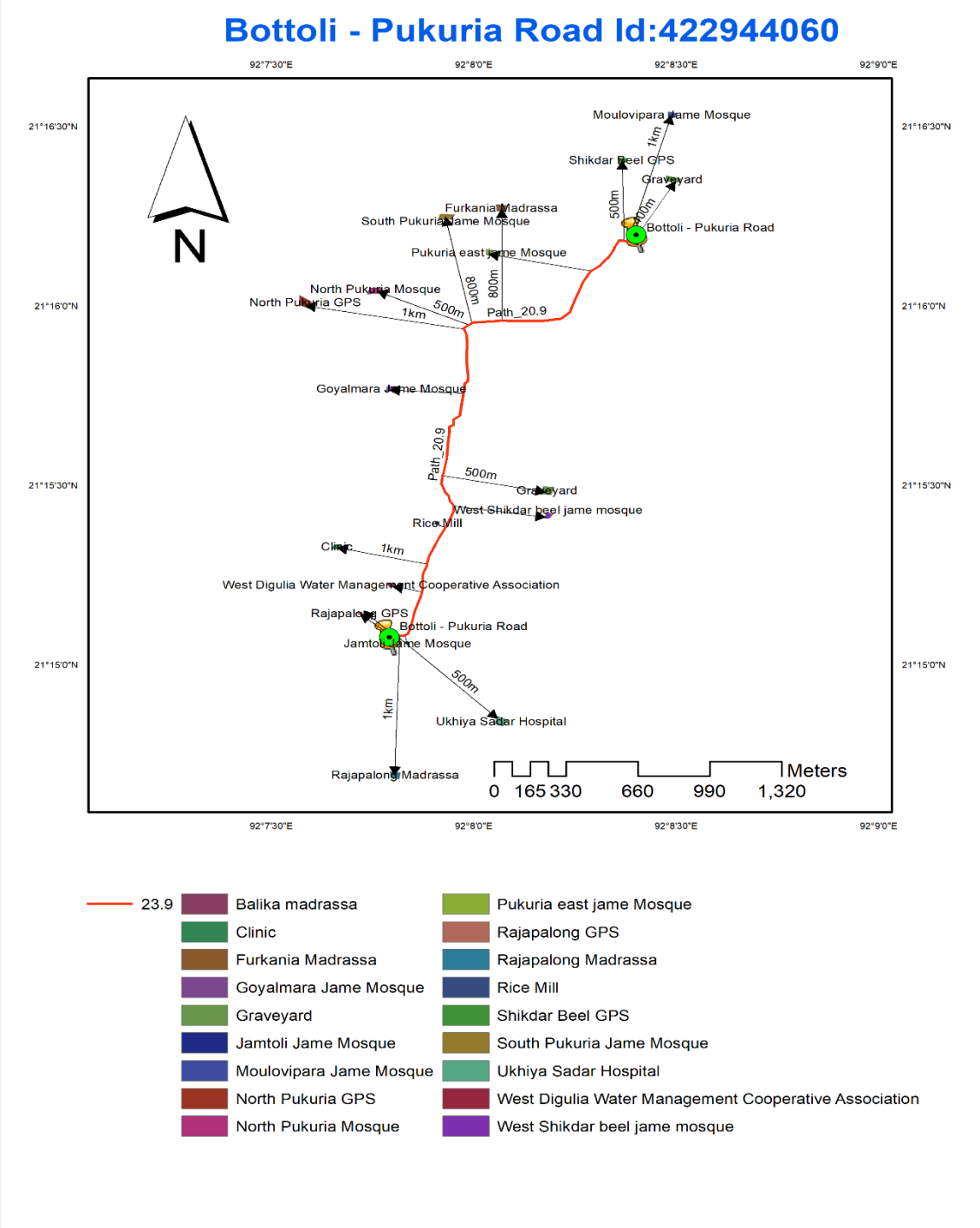
Section B: Environmental Screening

***B.1*: Environmental feature of sub-project location**

Description of cultural properties (if applicable, including distance from site):
Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests:

Graveyard(400m), South Pukuria Jame Mosque (800m), Shikdar Beel GPS (500m), Furkania Madrassa (800m), Moulovipara Jame Mosque (1km) to the North. Jamtoli Jame Mosque (30m), Ukhiya Sadar Hospital(500m), Rajapalong Madrassa(1km), Rajapalong GPS(1km), Balika madrassa(1km) to the south. West Shikdar beel jame mosque(500m), Graveyard(500m) to the east and North Pukuria GPS(1km), Clinic(1km), West Digulia Water Management Cooperative Association(250m), Goyalmara Jame Mosque(500m), North Pukuria Mosque(500m), Pukuria east jame Mosque(500m), Rice Mill(50m) to the west. There are no other sensitive environmental, cultural, archaeological sites within the catchment area of this sub-project.

A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas are shown below.



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive features found in the footprint area, except matured vegetation on the sides of the road which are homestead gardens and forest. Several mosques, madrasa and local settlement were found during the survey. It will not be affected by the construction works, as the activities will be carried out within the existing subproject boundary and necessary preventive and mitigation measures will be followed during the entire construction

period.

(1) Within/near Elephant Migration Routes Yes/No*

No. There is no existence of Elephant corridor/ route now, which have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) potential impacts on remaining forests in/around camps Yes/No

N/A (This activity will be confined within the existing subproject boundary)

(3) Other issues: N/A

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:

Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of vehicle-related pollutants 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/ preventable by mitigation measures.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, tractor, trailer, etc. move on roads adjacent to sub-project throughout the day and night generate noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation):

Landslide potential is low. There is low possibility of soil erosion or landslide during construction period of targeted sub-project. The impacts are negative but very small scale, site-specific within a relatively small area and adjustable by mitigation measures.

Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH):

Groundwater is the main source of potable water in the Sub-project area. The shallow depth is

about 50 feet to 80 feet and deep tube well depth is 700 to 750 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 600-800ft (Field survey, 2019). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer.

Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)

Status of wildlife movement:

N/A (None of the information was found about the wildlife movement in or across the area)

State of forestation:

Patches of vegetation containing large and matured trees are present in local and homestead gardens across the road side of the proposed subproject area which are located within 200m radial distance.

Summary of water balance analysis (For water supply scheme only):

N/A

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g. status of access road or any other facility required for sub-project to be viable):

An access point called Jhautola- West Goyalmara road is available. It is possible to carry construction materials on these roads to the construction site with limited traffic flow to avoid congestion.

Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction:

Toilet and water supply facilities will be ensured by the contractor in the vicinity of the construction area for all the components of the sub-project, electric connection will be established with the accommodation facility due for the workforce.

Electricity is available in the area.

Possible location of labor camps:

Labor camp can be established along the road since there are available open private lands. However, this will have to be done with the consent of land owner under a mutual agreement, with the supervision of the Engineer in charge.

Requirement and type of raw materials (e.g. sand, stone, wood, etc.):

i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction.

Identification of access road for transportation (Yes/No): Yes. Jhautola- West Goyalmara road is available as connecting road
Location identification for raw material storage: Adjacent to labor camp or different location is available. However, this will need placement on open fields and should be consulted with local committee. Material storage area must be well fenced and materials will be covered with tarpaulins.
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.): Earth/ mud, plastics, brick chips, dust from bricks during construction of project components will be produce. Also, sludge will be produced from labor camp latrines and kitchen waste mostly composing of organic matters as fiber, starch, carbohydrates and proteins. 10% of the kitchen waste may be classified as plastics or non-biodegradables. Solid waste may amount to 20 kg daily and sludge may amount to 5 kg per day.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g. Solids wastes, liquid wastes, etc.): **Solid waste:** Residual waste from the labor camps will be generated. Equipment maintenance/vehicles on-site and scrap material will occur during construction works which are mostly solid waste. Leftover oils or spills from machinery can be a high probability generating liquid waste. Waste from civil works. And the quantity will be tentatively 150 kg. **Liquid waste**: During construction period fecal sludge will be generated from the labor camp and the quantity would be nearly 6 kg per day, which would be reduced in weight in course of time. Leftover oils or spills from machinery can be a high probability generating liquid waste.
Type and quantity of raw materials used (wood, bricks, cement, water, etc.): **Type:** i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction. **Quantity**: It is difficult to give exact figures of construction waste produced on a typical construction site.
Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards: No such vegetation is present in the right of way. Specific soil amount is not needed for the project. The current condition explains that there is no aggregated soil on the right of way.

Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) The possibility is Medium, for stagnant water bodies to occur. Because water usage will be higher during the construction period. By default, this area has no water logging troubles due to being natural channels. Moreover, no possibilities of stagnation of water in long run. So, local communities have stated that they do not have severe troubles with mosquitos or other disease vectors.
Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No pre-existing waterbody or drainage is present
Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. Because under this intervention, there is very little scope of damage to terrestrial or aquatic ecosystems or endangered species.
Activities that can lead to landslides, slumps, slips and other mass movements in road cuts: Scope of work leading to low scale effects of landslide. The impacts are negative but short-term and site-specific. It can be managed through mitigation measures.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description) Low, since both sides of the road is more or less similar elevation. The concentrated outflow will be managed since the sub-project has included drains.
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: No
Chance of long-term or semi-permanent destruction of soils: (High/Medium/Low with description) No
Possibility of odor and water, soil quality impacts from SWM and FSM disposal system: (High/Medium/Low with description)

No
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) There is no possibility of stagnant water bodies remained for encouraging mosquito breeding and other disease vectors, during the operation phase.
Likely direct and indirect impacts on economic development in the project areas by the sub-project: Construction or implementation of a road project substantially contributes to the development of the project areas. It surely improves the communication network, reduces the transport time, increases the trade and business in/around the areas, and ensures access to better living conditions with amenities, better educational and job opportunities and health facilities. Thus, the direct and indirect impacts on economic development in the project areas would be enormous by this sub-project.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No existing drainage channels or surface water bodies found in the project area; therefore, no such effect can be anticipated
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. There are no protected areas in or around project sites, and no known areas of ecological interest.
Activities leading to landslides, slumps, slips and other mass movements in road cuts: The entire sub-project component area is nearly flat; thus, no such type of impacts is anticipated.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) No
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: Improved communication will definitely increase the traffic/ vehicular movement, which must increase the light and noise pollution, but air pollution effect will not be increased significantly, as the proposed BC road will reduce the pollution generated from dust on the muddy road, especially during the dry season and if the vehicles are maintained in good conditions

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

Section D: Environmental Screening Summary of the Work Package-W23.9

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
1: Sub-Project Interventions	**Air quality**	Under the subproject intervention the overall score is **low**.	• Limiting earthworks; • Watering of dry exposed surfaces and stockpiles of aggregates at least twice daily, as necessary; • Requiring trucks delivering aggregates or bricks and cement to have tarpaulin cover and Limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Covering of trucks; • Records of air quality inspection;	Visual monitoring of air quality and if requires, air quality test (CO, $PM_{2.5,10}$) once in construction period in winter season.
	Soil impacts	Under the sub-project intervention the overall score is **low.**	• Precautions might be taken when rainstorms are likely, when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms. • The earthwork sites where exposed land surface is vulnerable to runoff shall be consolidated and/or covered. • The material stockpile sites shall be far away from surface water bodies and areas prone to surface run-off. Loose materials shall be bagged and covered. • Channels, earth bunds, netting, tarpaulin and or sand bag barriers	Construction Contractor monitored by Consultant and PIU	• No visible degradation to nearby drainages, • *khals* or water bodies due to soil erosion. • Rain storms in construction phase.	Monitoring as weekly basis.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
			shall be used on site to manage surface water runoff and minimize erosion. • The overall slope of the work areas and construction yards shall be kept to a minimum to reduce the erosive potential of surface water flows elsewhere.			
	Hydrology (surface and groundwater)	Under the subproject intervention the overall score is **low**.	• All precautions to store chemicals/oil/fuel properly so that no chance of spill. • Workers must specify waste dump locations to avoid littering which in turn might negatively affect surface and ground water. • Monitor water quality according to the environmental management plan.	Construction Contractor and monitored by Consultant and PIU	• Areas for stockpiles, storage of fuels and lubricants and waste materials; • Records of water quality inspection; Water Quality Test • (National Drinking Water Quality Standard Parameters)if requires; • No visible degradation to nearby drainages, *khals* or water bodies due to construction	Water quality test (mainly GW) twice during the construction period in six months interval.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
					activities. • Records should be kept and logged.	
2: Pre-construction Phase	**Sanitation, water supply**	Under the subproject intervention the overall score is **low**.	• Provide suitable housing, adequate supplies of potable water, and toilet and bathing facilities within labor camp area for the assigned laborer. • Provide means for disposing of wastewater from toilets, baths and food preparation areas either through a septic tank and soak away, or holding tank with removal by vacuum truck. • Records for any type of training or awareness building sessions must be kept at site.	Construction Contractor and monitored by Consultant and PIU	• Site-specific H&S Plan; • Records of supply of uncontaminated water; • Record of Health &Safety orientation trainings; • Condition of sanitation facilities for workers	Visual inspection by PIU and supervision consultants on monthly basis
	Transportation	Under the subproject intervention the overall score is **low.**	• Contractor should verify vehicles for the suitability of carrying, loading and unloading of materials	Construction Contractor and monitored by Consultant and PIU	• Record of regular inspection. • Record of accidents/incidents	Monthly monitoring.
	Storage of construction	Under the subproject	• Orienting concerned person and team assigned for the construction	Construction Contractor and	• List of materials and sources of	During implementation

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
	materials	intervention the overall score is **low**.	work.	monitored by Consultant and PIU	materials;	phase, as necessary with discussion with PIU, Consultant
3: Construction Phase	**Wastes**	Under the sub-project intervention the overall score is **low.**	• Prepare and implement on-site waste water runoff and labor camp waste management plan approved by PIU and consultants. • Wastes must be placed in the designated bins which must be regularly emptied. These shall remain within demarcated areas and shall be designed to prevent wastes from being blown out by wind. • All waste must be removed from the site and transported to a disposal site.	Construction Contractor and monitored by Consultant and PIU	• Complaints from community; • Regular inspection of waste management activity; • Waste disposal record.	As work weekly progresses
	Cut and fill Activities (Cutting of hill slope and earth removal from borrow areas caused for soil erosion and landslides)	Under the sub-project intervention, the overall score is low.	• During construction cut and fill will be balanced as far as is possible. Designs shall ensure that as far as possible all cut and fill activities are balanced • Proper care will be taken during cutting and filling so that slope or toe of the road embankment remain within the right of way and does not disturb the crop.	Contractor, environmental specialist of D&SC	• Location of road alignment and slope.	Daily as work progresses

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
	Storage of materials	Protected and safety storage to be needed for construction materials storage. Not interrupt natural land contours, disturbance in natural drainage patterns and logging of water and the overall score is **low.**	• With the assistance from site management committee in Camp to identify the storage site and other requirements, which will be approved by PIU and consultants.	Construction Contractor and monitored by Consultant and PIU	• List of materials and sources of materials; • Storage areas for materials and equipment.	Monthly basis during implementation phase, as necessary with discussion with PIU, Consultant
	Removal of Vegetation (May cause soil erosion and their deposition on nearby crop field, affecting soil quality and productivity)	Under the sub-project intervention, the overall score is **low.**	• If during detailed design cutting of trees is required, compensatory plantation for trees lost at a rate of 5 trees for every tree cut. • Prevent workers or any other person from removing and damaging any flora (plant/vegetation) and fauna.	Contractor, environmental specialist of D&SC	• Complaints from community;	Daily

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
	Noise pollution	Under the subproject intervention the overall score is **low.**	• Consultation with affected people; not to operate noisy equipment during working period; • No noisy work after 5.00 pm. • Sound suppression for equipment; • Ear protection for workers. • Conduct noise quality monitoring as per EMP.	Construction Contractor and monitored by Consultant and PIU	• Number of complaints from stakeholders; • Use of silencers in noise-producing equipment and sound barriers; • Noise Level following decibel meter (dB)	Inspection by PIU and supervision consultants on monthly basis;
	Air pollution	Under the subproject intervention the overall score is **low.**	• Water spraying for dust control; construction materials with potential for significant dust generation shall be covered; no smoke emitting equipment; and limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor and monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Records of air quality inspection.	Visual observation and monitoring of air quality during construction period.
	Road Safety and Accidents	Under the subproject intervention the overall score is **low.**	• Erection of suitable signage at construction sites • Direct observation and discussion with local people • Restrict the transport of oversize loads. • Operate construction vehicles to non-peak periods (night) to minimize the traffic disruption. • Enforce on-site and access road speed limits.	Construction Contractor, environmental specialist of D&Sc.	• Complaints from communities, pedestrians	Day basis during work time

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
			• The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc. • Local residents should be kept informed about planned Works			
4. Post Construction	**Road Safety**	Under the issue the overall score is **low**.	• Install traffic signs for speed limit, speed breaker where needed, Mile post and create adequate ***traffic*** detours, and sufficient ***signage*** & ***warning*** signs, Post speed limits and suitable bending on the road. • The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc.	Construction Contractor, environmental specialist of D&Sc	• Road signage and safety instruments at suitable locations and chainage	Immediately after the construction work is over.
	Tree re plantation	Under the issue the overall score is **low**.	• Replantation of trees during monsoon period • Maintain of trees properly • Check survival of trees and replant the dead trees	Construction Contractor, environmental specialist of D&Sc	• Number of complaints from stakeholders; • Records of trees number and tree plantation inspection;	Immediately after the construction work is over.
5. Operatio	**Maintenance of road and**	Under the issue	• No advertisement/boardings shall be allowed within the Right of Way	LGED	• Number of complaints from	During Operation under LGED's

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
nal Phase	**assets** (Road accidents may increase due to higher number of vehicles using the roads at increased speeds)	the overall score is **low**.	limits of the project road. • Regular maintenance and cleaning of assets such as sign boards, road safety sign etc. shall be undertaken. • Clear smooth speed breaker/rough surfaces should be clear in views. • Regular maintenance of road surface and shoulders.		stakeholders;	regular maintenance program in each 3 years.

* Overall Impact Score: High = Likely to cause long-term E&S impacts; Medium = Likely to cause temporary impacts; Low = Likely to cause little, short-term impacts

**Post-construction phase denotes the time period contractor use to clear and clean up the sites after the construction work is ended, perform tree plantation, grass turfing, and minor rectification till the official handing over the site to LGED, or owner of the site.

Recommendation for further environmental and social assessment and/or site specific environmental and social management plan: Yes

**If yes, please specify what assessments/plans would be required.* Mention some recommendation on E&S assessment …. ESMP

If site specific environmental and social management plan (ESMP) is followed the impacts can be mitigated and monitored. ESMP is attached.

Appendix-2: Environmental and Social Management Plan (ESMP)

ESMP for Access and evacuation Roads; *(LGED/EMCRP-W23.9): Bottoli - Pukuria Road Id:422944060*

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
Pre-Construction Stage	Loss of land / and other physical assets	• No land acquisition is allowed within this sub-project activities So, there are no any mitigation measures according to this impact.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of livelihood	• Under this subproject, there is no scope of negative impact of adjacent livelihoods	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Stakeholders Engagement	• All of the project stakeholders should be consulted • Separate community level consultation meeting with the potential affected HHs • Consultation meeting with host communities about the project objectives and scope of works	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of right to access	• Project to ensure thorough analysis of alternatives that access enjoyed by the community remains intact. • In case of unavoidable circumstances, alternative access will be provided.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Site Selection & implementing interventions: Human-elephant conflict	• Selection of sub-project sites and all implementing interventions must take place outside of the elephant corridor/influence area.	PIU	Environmental Consultant of PIU, PSC
Pre-Construction Stage	Site Preparation: Soil Erosion; Alteration of natural drainage	• Our selected sites avoided the low land near the water bodies or natural flow path to avoid the flash flood or any kind or surface runoff.	PIU & Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Tubewell location within the construction site is not near to any kinds of latrine and soaks well which could be contaminated by those. • After completing the development, we restored the place as like before to avoid the cut and fill operational problems. • This site is in the local community, so we discussed with the local community to avoid any conflicts related local habitation, culture. • Sub project intervention mustavoid of natural disturbance of existing slop and natural drainage. • The contractor ensuring sound environment for the local residents near the sub project site.		
Construction Activity	Noise from construction works	• Construction activities mostly will finish at day time within 05 PM, and must confirm proper measures for avoiding any disturbance. • All Personal Protective Equipments (PPEs) must be ensured in sites before starting any kinds of construction works.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Dust	• Acceptable range of emission of CO, particulate matter [SPM (**Suspended particulate matter)**, PM2.5, 10] and Hydrocarbons must be maintained through good construction work practices • Dust generation must be limited as a result of clearing, leveling and site grading operations with using water florescent manually and through water	Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		pipes. • Dust generation due to vehicle movement on connecting road shall be controlled by watering the path at limited level		
Construction Activity	Safety Issues	• Unauthorized entry is completely prohibited in our site and take necessary measures for preventing this problem • Before works started Contractor must provide proper training and guidelines on health and safety issues to the labors and associated staffs. • Records of every training must be kept at site. • All kinds of Child labour are completely prohibited in every site. • Every construction materials storage site will be well fenced by Tin and safety caution tape.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Traffic Management	• Contractors will maintain proper route for traffic management which is to beconsulted with and confirmed by the Executive Engineer of Cox's Bazar.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Conflicts with existing users due to the scarcity of resource base.	• A detailed assessment of the available resources and consent of the local representative for withdrawal of water from existing surface water sources shall be taken. • If ground water is withdrawn, adequate approvals from the appropriate department need to be undertaken before setting up bore wells. • Any type of consent letter or agreement for	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		withdrawing water from either surface or underground sources will be kept on site. • Local community must be consulted before any construction works starts.		
Construction Activity	Increase in road accidents	• Maintain safety measures during the movement of heavy machinery and equipment. • Local community will be trained up on traffic management and awareness.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Labour Base Camp: Conflicts with the local residents	• Awareness building session will be undertaken about prevention of child abuse, child marriage, GBV, sexual harassment, trafficking of women and children as well as illegal drug trade. Written records of this awareness building session shall be kept on site. • Work force should be prohibited from disturbing the flora, fauna including hunting of animals, wildlife hunting, poaching and tree felling. • Adequate facilities ensuring sanitation for labour camps will be put in place • Treated water will be made available at site for drinking purpose. • Adequate accommodation arrangements for labour forces. • Labor code of conduct is to be disclosed through consultation.	Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Construction Activity	Waste Management: Improper management and handling of	Preparation of a waste management plan covering the following aspects:	Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
	hazardous and non-hazardous waste during construction.	• Residual waste from the temporary accommodation facilities for labor Waste and from equipment maintenance/vehicles on-site • After completion of construction works. So, recycling process is not applicable. • Proper consents for hazardous waste management.		
Construction Activity	Health & Safety Risks: • The potential for exposure to safety events such as tripping, working at height activities, fire from hot works, smoking, failure in electrical installation, mobile plant and vehicles, and electrical shocks. • Exposure to health events during construction activities such as manual handling and musculoskeletal disorders, hand-arm vibration, temporary or permanent hearing loss, heat stress, and dermatitis.	• All construction equipment will be properly inspected timely. • The risk assessment will be prepared and communicated prior to the commencement of work for all types of work activities on site. • Preparation of proper walkways and clearly designation as a walkway has to be ensured; all walkways shall be provided with good conditions underfoot; signposted and with adequate lighting. • Proper Signpost at any slippery areas will be ensured in construction site. • Fire extinguishers will be located at identified fire points around the site. The extinguishers must be appropriate to the nature of the potential fire. • This sub project has Proper communicative emergency response plan (ERP) with all parties, the ERP to consider such things as specific foreseeable emergency situations, organizational roles and authorities' responsibilities and expertise, emergency response and evacuation procedure and personnel will	PIU & Contractor	Environmental Consultant as well as Social Development and Gender Specialists of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		be trained and drilled to test and ensure the coherence with the plan. • All people of construction site will be concerned about the safety and maintenance of Electrical equipment; works will be carried out on live systems. • Provision to first aid box in sub-project areas will be ensured. • Proper Emergency evacuation response plan will exist in sub-project area. • All safety equipment will be available in sub-project site (safety, size, power, efficiency, ergonomics, cost, user acceptability etc.), the lowest vibration tools will be provided that are suitable and can do the works. • Awareness training will be given to all personnel involved during the construction phase in order to highlight the heat related illnesses of working in hot conditions such as heat cramps, heat exhaustion, heat stroke, and dehydration. Written records of this awareness training shall be kept on site. • Adequate quantities of drinking water will be available at all Sites, on different locations within the site. • Provision to maintain proper PPE wherever necessary and to ensure that there are satisfactory washing and changing facilities. • Provision to ensure all workers exposed to a risk are aware of the possible dangers and also given thorough		

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		training on how to protect themselves and there should be effective supervision to ensure that the correct methods are being used.		
Operation &Maintenance	Noise disturbances to fauna	• Provision to maintain noise and vibration from the operation and maintenance of machinery and equipment by proper monitoring and measures. • Provision to take necessary lighting, caution for the works and necessary maintenance should be done in day light.	PIU	Environmental Consultant of PIU, PSC. Union Member
Construction activity	Odours and pollution caused by leaking latrines and faecal sludge, and solid wastes impacting surrounding water bodies, flora and fauna	• Preventative maintenance schedule should be followed. • Solid organic wastes should be stored in bins and/ or skips and emptied regularly at a designated waste disposal area away from the camp site. If no designated site is available within the reach, a dug-hole at a nearby place can be used with periodic filling with soil layer for preventing pollution and generating nutrient rich compost soil over time.	PIU	Environmental Consultant of PIU, PSC. Union Member
Decommissioning during the project implementation period (including site clearance after the construction)	The impacts are similar to those listed in construction stage: • Pollution from waste materials • Health & Safety risks to workers and local community	• Contractor must prepare a demolition and waste management plan including following directive aspects given hereunder.	PIU / Contractor	Environmental Consultant of PIU, and Executive Engineer of Cox's Bazar

Waste Management Plan:

The Contractor shall develop a waste management plan for various specific waste streams (e.g., reusable waste, flammable waste, construction debris, food and organic waste etc.) prior to commencing of construction and submit to LGED for approval. The plans must include following principles or series of actions, which will be carried out/followed by the contractor and supervised by the Field level Environmental Specialist and Social Development Specialist.

For wastes:

- The quantity of waste materials shall be minimized by 3R (Reduce, Recycle and Reuse) approach, and wastes shall be segregated accordingly, wherever practical; and stored in designated places/facilities in the site.
- Construction site shall be maintained in a cleaner, tidy and safe condition and appropriate facilities shall be provided and maintained as temporary storage of all wastes before transportation and final disposal.
- Hazardous waste viz. waste oil etc. will be collected and stored in a paved and bounded area and subsequently sold to authorized recyclers.
- The scrap material generated from related construction activities will be collected and stored separately in the stack yard and sold to local recyclers.
- All wastes generated during construction shall be disposed off in an environmentally acceptable manner. This will include consideration of the nature and location of disposal site, so as to cause less environmental impact.
- Other leftover non-hazardous wastes, including construction debris shall be transported to an approved disposal site by pick up tracks or back loaded vehicles with proper care.
- Organic wastes produced in the camp site during the construction period shall be collected and transported in vehicles covered with tarps or nets to prevent spilling waste along the route to the designated disposal site;
- Burning of any type of wastes in the construction site shall be prohibited completely.

Prepared by: Harogopal Kabiraj, Environmental Focal Person, +8801714980171

Tanvir Ahsan Haque, Environmental Specialist, +8801688117059

Ms. Sadia Azad, Disaster and Climate Change Specialist, PIU.

Reviewed by: Md. Saiful Islam, Field Level Environmental Specialist, +8801913442006

Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.9

In consideration to the above-mentioned environmental impacts and their mitigation measures for all sub-projects, individual BOQ for each component has been prepared. Following tables will illustrate such items of enhancement and impact mitigation works as well as considering the emerged situation of COVID-19, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites.

Cost of Environmental Enhancement Works for W23-9 in BOQ

Sl no.	Description of item	Quantity	Unit price	Total amount
1.	**Grass Turfing** Turfing on embankment top and slope & any critical place with good quality turf supplied by the contractor of not less than 225mm square in dimension including placing and watering till grass is fully grown, etc. all complete as per direction of E.I.C. (Payment to be made only when grass is fully grown)	8490 Sq.m	@38.15 Tk. Per sqm	323,893.50
2.	**Dust suppression measures** Dust suppression measures like water sprinkling on aggregates/unpaved roads, in and around the work site and as per direction of E-I-C	2845m	@ 2.56 BDT	7283.20
3.	**Water Supply and Sanitation** Providing and maintaining adequate portable water supply, sanitation, cleanliness facilities at camp site and work site to the entire satisfaction of Engineer-in-charge. **Temporary Toilet:** Construction of temporary toilets in work site/ rest area complete as per design and specifications and approved by the Engineer-in-Charge. There should be 1 camp in each site. In each camp, there should be 1 no of toilet for women and 1 no of toilet for men.	2 nos.	@12822.86 per toilet	25,645.72

Sl no.	Description of item	Quantity	Unit price	Total amount
4.	**First Aid Box** Supplying, equipping and maintaining adequate first-aid box throughout the working period at worksite and site office, and erect conspicuous notice boards directing where these are situated and providing all requisite emergency medical first aid kits, including complying with the government medical or labour requirements at all times, and provide, equip and maintain necessary dressing kits throughout the working period for attending minor injuries, etc. all complete as per requirement and full satisfaction of Engineer-in-charge.	1 no.	LS @5000 Tk. Per box	5,000
5.	**Drinking Water Facilities** Providing continuous adequate drinking water supply at worksite and site office as well by installing necessary tube-well/s where applicable or any other means depending on local situation, also providing essential arrangement for storing drinking water by supplying portable best quality water tank equivalent to Gazi/Padma of adequate capacity depending on the number of users, including supplying 1 (one) no. best quality water filter of minimum capacity 30 liters with necessary kits, etc. all complete as per satisfaction and direction of the Engineer-in-charge.	2 no.	LS @ Tk. 30,000	60,000
6.	**Traffic Management** Maintaining traffic management at worksite from time of commencement of contractor's activities to time of completion activities, including ensuring that the road is safe for users, providing a safe working area for those involved in work on trafficked network and minimizing any disruption to smooth flow of traffic (this includes providing necessary barricades, warning signs/lights, guide signs, flagmen, maintaining diversion roads by cutting, filling, constructing, etc. or by any other means) in accordance with the full satisfaction of the Engineering-in-charge.	1 no.	LS @ Tk. 15,000	15,000

Sl no.	Description of item	Quantity	Unit price	Total amount
7.	**Personal Protection Equipment for Workers** Providing and maintaining appropriate (safe design, fit and comfort) personal protection equipment (PPE) to ensure the highest possible protection for employees in establishing and maintaining a safe and healthful working environment at workplace, including demonstrating, providing training on proper understanding and development of skill in the use of PPE, including supplying (i) best quality safety jacket, (ii) suitable hand protection gloves, (iii) appropriate foot protection shoes, (iv) best quality safety helmets, face shields, ear muffs etc. (v) suitable eye protection goggles	LS	LS @ Tk 30,000	30,000
8.	**Tree plantation** Tree plantation to compensate the felled down trees and enhance the ecological condition in the subproject area- preferably local fruits, flowers, medicinal and ornamental trees- Mango, Jackfruit, Jam, Kathbadam, Chalta, Krisnachura, Bokul, Jarul, Polash, Kadom, Shimul, Neem, Arjun, Amloki, Horitoki, Bohera, Mahogany, Palm Tree, Chambal, Rain Tree, Shil koroi, Satim, Sishu (including protection, fencing and conservation during project defect liability period): Preferably at both sides of Road where space is available (fencing as per LGED rate schedule 5.26.14) (Contractors will also be instructed by the consultant and PIU prior to the tree plantation work) at an interval of 10 feet.	200 nos.	@ Tk. 1000	200,000
9.	**Motivation training** Motivation training (twice: before and after construction start) of the Upazila Engineer 'sand Contractor's representatives on safety practice and as per direction of the E.I.C.	1 no.	LS @ Tk. 10,000	10,000
10.	**Waste disposal facility** Temporary camp site waste disposal facility improvement 2 nos. (1 no of organic waste and	LS	@ Tk. 5000	5,000

Sl no.	Description of item	Quantity	Unit price	Total amount
	1 no of inorganic waste disposal facility) and as per direction of E.I.C.			
11.	**Water Test (Drinking Water samples)** Water samples are to be collected periodically (half yearly) from the tube well at labor shed area for laboratory analysis of different parameters such as pH, arsenic, iron, chloride, hardness, total dissolved solids, nitrate, nitrite, coliform, electrical conductivity etc. all complete as per direction of E.I.C. (including the cost of actual fees for testing from reputed laboratory and report) as desired by E.I.C.	LS	@ Tk. 5000	5,000
12.	**Working labour shed:** Construction of Labor shed (Size: 30'x20') with C.I sheet Roofing, Tarza fencing and brick soling floor as per requirement and direction of the E-I-C.	1 no.	LS @ Tk. 30,000	30,000
13.	**Environmental management** Environmental management costs of the Environment & Social/ Safeguard Personnel for Environmental and Social Management and Monitoring during construction and operation phase for their salary & transport (Net payment excluding Tax &VAT). And as per direction of the E.I.C. **(One Safeguard Personnel for R6, R8, R9, R12 & R15)**	1 person	Monthly basis @Tk. 35,000.00 for 12 months. One person covering 5 roads i.e.35,000Tk.*12months*(1/5 one road).	84,000.00
	Subtotal Bill: Environmental facilities			**800,822.42**

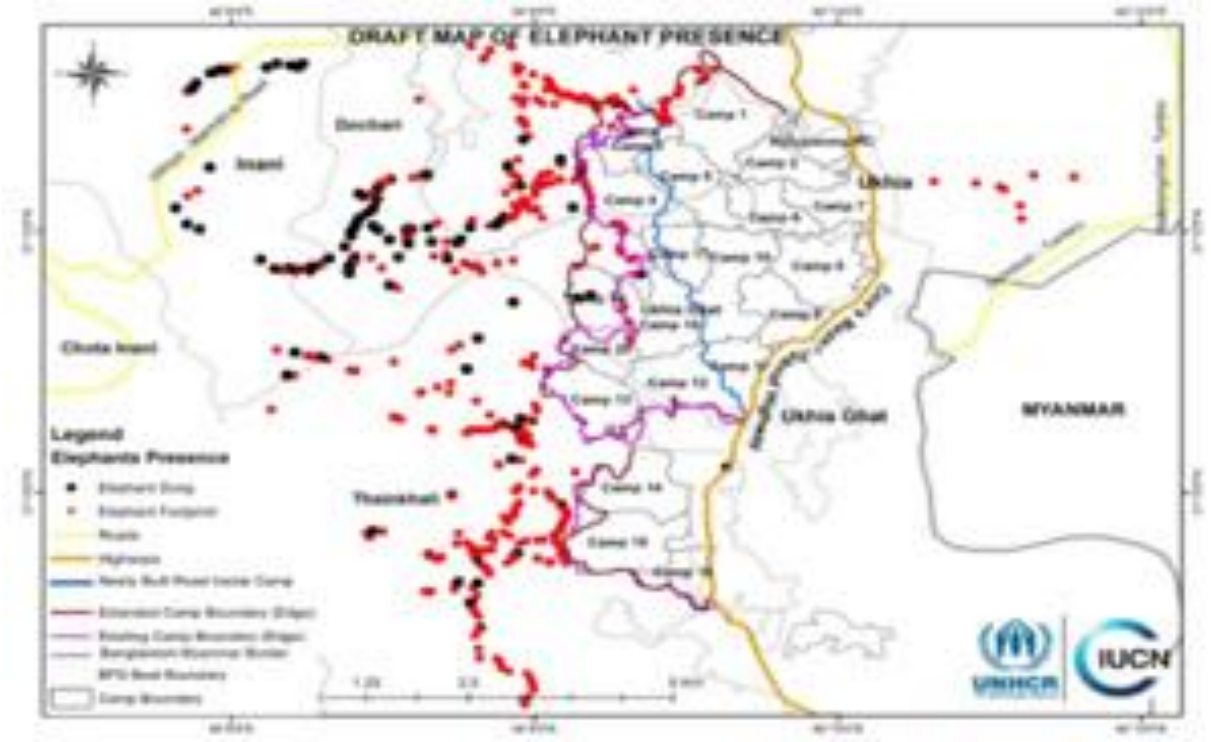
Cost of H&S Measures under COVID 19 Situations for W23-9

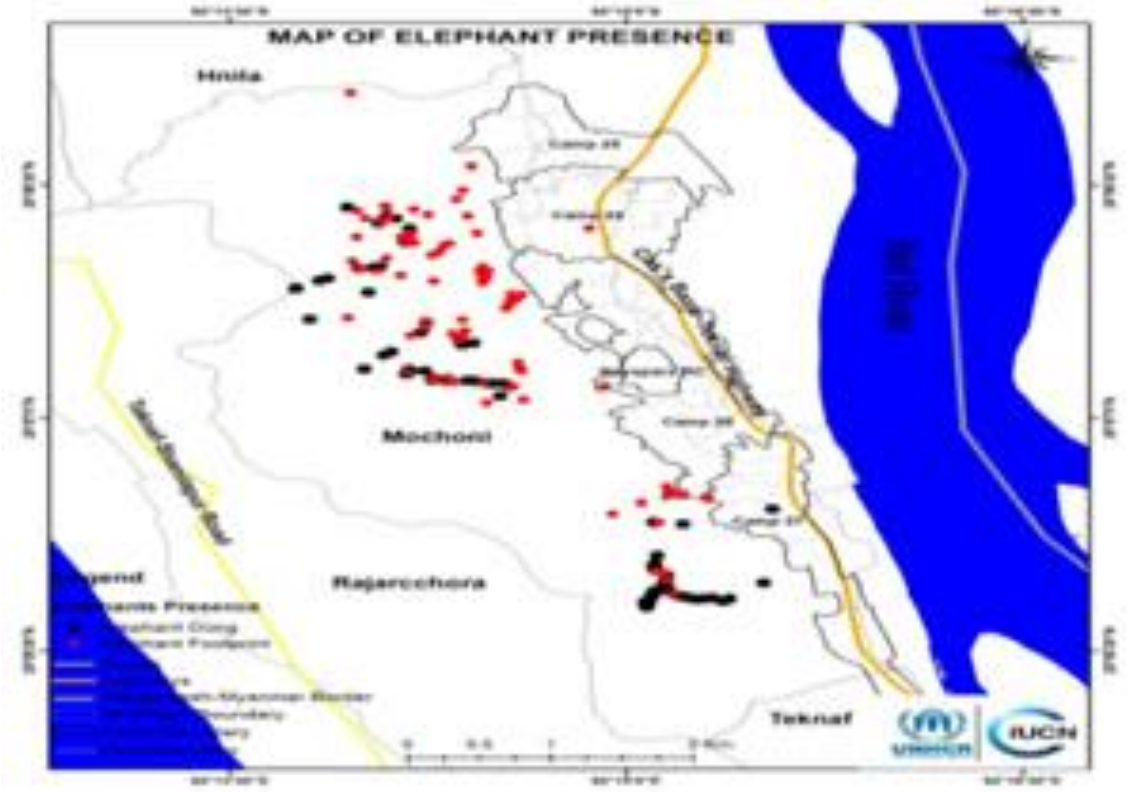
Considering the emerged situation, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites. The cost is estimated counting 55 workers for 270 active working days (9 months in a year) in a contract period for one site under this package (EMCRP/W-23.9).

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
1.	Non-Contact IR Digital Thermometer	01 nos. in each site	N/A	N/A	5,000.00	1	5,000.00	Each site office will have a thermometer for checking body temperature every morning at the entrance of the working site
2.	Wash Basin with Small Water Tank, Bucket and Mug (or piped water supply)	01 nos. in each site	N/A	01 nos. in each camp	10,000.00	2	20,000.00	Wash basin to be installed at favorable locations immediately after the entrance to the facility
3.	Trash bin (covered)/Paddle Bin	01 nos. in each site	N/A	01 nos. in each camp	550.00	2	1,100.00	
4.	Bar Soaps (150 gm each)	149		186	50.00	335	16,750	To be placed in a case/holder on the basin, for washing hands for max. 21 people a day and showering of 18 workers in each labor camp.
5.	Hand Sanitizer (2 nos. 250 ml bottle and 5 liter Can for Refill)	2 bottles and 1 Can for each site	N/A	N/A	4,000.00	1	4,000.00	2 bottles and a 5 litre can for each Site office
6.	Face Shield/ Protective Safety	33 nos. for each site		N/A	400.00	33	13,200.00	For labors who work in close contact, 33 in each site

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
	Goggles							
7.	One time Mask (Disposable) for Contractors' Staffs	5 nos. each day in each site		N/A	12.00	810	16,200.00	Reusing N95/KN95 mask will not be a manageable option in field scenario, one time disposable medical/surgery mask a good option instead.
8.	Cloth mask for Workers	N/A	55 nos. for each labor camp		35.00	990	34,650.00	A worker will use a mask for 15 days with everyday washing
9.	Floor Cleaner (1 litre Can)	2.5 Can	N/A	3 Can	250.00	5.5	1,375.00	
10.	Detergent Cleaner	N/A	2 kg in each camp/month		400.00	18	7,200.00	To be used for washing clothes, masks and tools & equipment, etc.
11.	Miscellaneous cost				20,000.00	1	20,000.00	Contingency cost for medical emergency and compensation for workers, subject to proper documentation
	Grand Total						**139,475.00**	

Appendix-4: Elephant Migration Routes Map





Elephant presence map (latest information published by on 24 May 2018)

Appendix-5: Location Map of Sub-project component

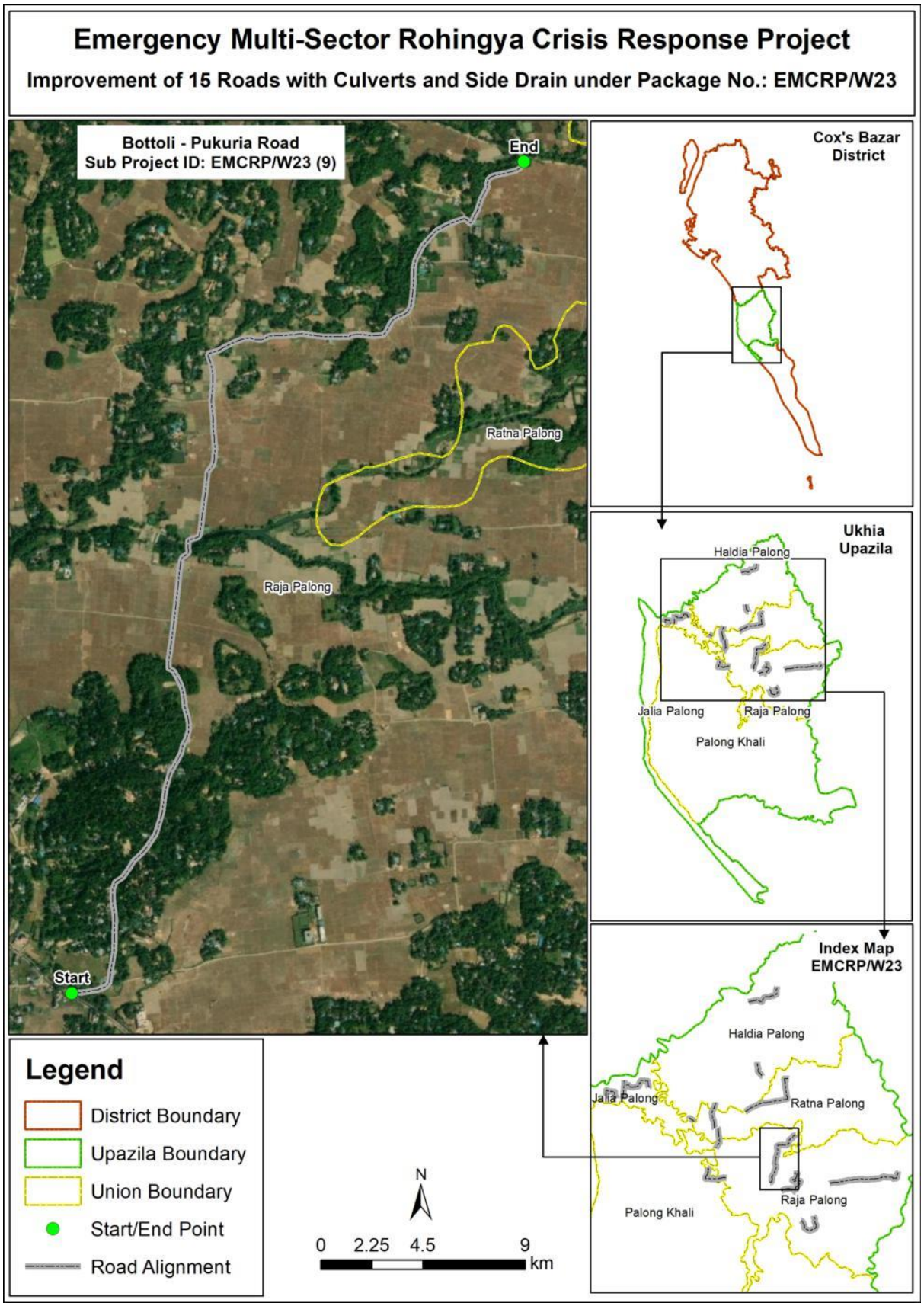
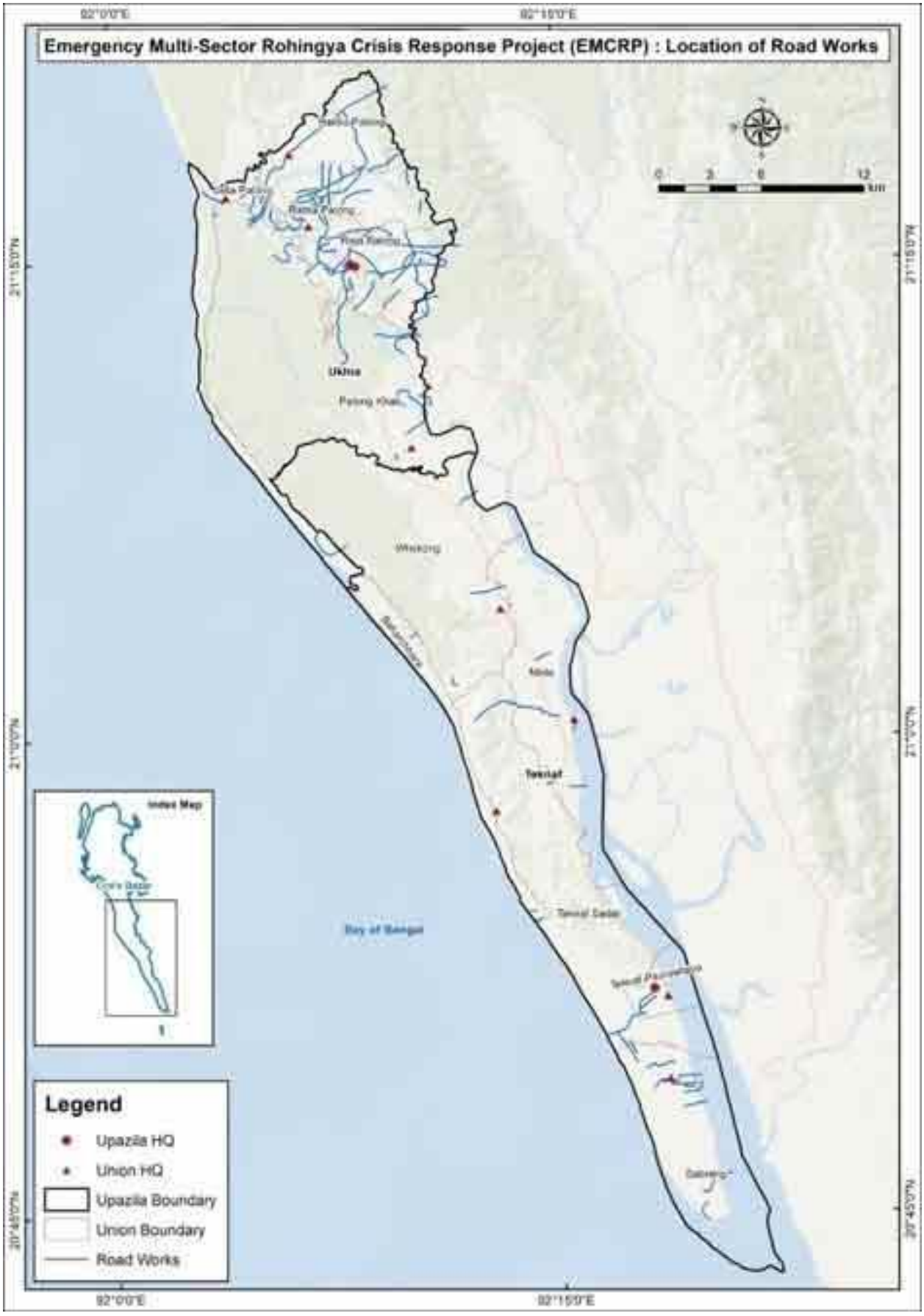


Figure: Location Map of W23-9



District map showing Ukhiya and Teknaf Upazila



Upazila map locating proposed roads

GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH
Ministry of Local Government, Rural Development and Co-operatives
Local Government Division
Local Government Engineering Department

Emergency Multi Sector Rohingya Crisis Response Project (EMCRP)

Project ID: P167762 **IDA Credit No. 5561-BD**





Environmental Screening Report

For Telipara - Mazerpar Road ID-422944050 with culverts and side drain under Cox's Bazar District.

Under the package no. EMCRP/W23

Funded by:

THE WORLD BANK
IBRD • IDA

Government of the People's Republic of Bangladesh & World Bank

Design and Supervision Consultancy:

ddc Development Design Consultants Ltd.

October-2020

Contents

1. INTRODUCTION 1

1.1 Project background 1

1.2 Elementary information of Work Package Component of W23.9 2

1.3 Proposed intervention items for this component 4

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS 4

2.1 Methodology 4

2.2 Important features/establishments within the PIA 5

2.3 Issues and Recommendations raised by the Participants in regards to component interventions for W23.9 6

3. ENVIRONMENTAL SCREENING 7

3.1 General 7

3.2 Major Findings 8

3.3 Climate Change Impact Screening 10

3.3.1 General Overview of the area 10

3.3.2 Site Specific Screening and outcome 11

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) 12

4.1 General 12

4.2 Health and Safety Measure under COVID Situation 14

4.3 Cost of Environmental Enhancement Works in BOQ 15

5. LIMITATION OF THIS STUDY 15

6. CONCLUSION AND RECOMMENDATIONS 16

Annexure-01: Important Environmental Features (IEFs) near site 17

Annexure-02: Attendance of consultation meetings for W23/9 18

Annexure-03: Pictures of sub-project component location and surrounding features with public consultation 19

Appendix-1: Environmental Screening Form for examining sub-project component 20

Appendix-2: Environmental and Social Management Plan (ESMP) 38

Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.9 46

Appendix-4: Elephant Migration Routes Map 52

Appendix-5: Location Map of Sub-project component 53

ACRONYMS

BOQ	Bill of Quantities
BFS	Brick Flat Soiling
D&SC	Design and Supervision Consultant
DoE	Department of Environment
DRP	Displaced Rohingya people
EA	Environmental Assessment
EC	Electrical Conductivity
EMCRP	Emergency Multi-Sector Rohingya Crisis Response Project
ESMP	Environmental and Social Management Plan
ERP	Emergency Response Plan
ESMF	Environmental and Social Management Framework
FDMN	Forcibly Displaced Myanmar National
FGD	Focus Group Discussion
FSM	Faecal Sludge Management
GBV	Gender Based violence
GPS	Government Primary School
GRM	Grievance Redress Mechanism
HBB	Herring Bone Bond
IEFs	Important Environmental Features
ISCG	Inter Sector Coordination Group
IUCN	International Union for Conservation of Nature
IWM	Institute of Water Modeling
LGED	Local Government Engineering Department
PIA	Project Influence Area
PIU	Project Implementation Unit
PMU	Project Management Unit
PPE	Personal Protective Equipment
PSC	Project Steering Committee
SMC	School Management Committee
SPM	Suspended Particulate Matter
SWM	Solid Waste Management
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
UNHCR	The United Nations High Commissioner for Refugees
VAT	Value-Added Tax
WB	World Band

1. INTRODUCTION

1.1 Project background

An estimated 730,000[1] people of Rohingya community has fled to neighboring Cox's Bazar district of Bangladesh since August 25, 2017 to escape extreme violence in Rakhine State of Myanmar, which caused the total number of Forcibly Displaced Myanmar National (FDMN) in the district to be about 923,033[2]. This huge number of displaced population account for about one-third of the total population of Cox's bazar, a district which was already facing many development challenges and suffering from resource-constrained social service delivery system even before the crisis evolved and the mass exodus of FDMN has worsened the situation further. Almost all of these displaced people are hosted in Ukhiya and Teknaf Upazila of Cox's Bazar, in extremely congested settlements in areas having very minimal access to basic infrastructure and services and is prone to natural disasters. The Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP) has been designed in order to reduce the vulnerability of Forcibly Displaced Myanmar National (FDMN) along with people from the host communities in Teknaf and Ukhiya Upazila under Cox's Bazar District, to different disasters and improve the social service delivery system and disaster resilience to both the communities. This project will follow a sustainable development pathway that is resilient to disaster and climate change effects.

The objective of the Project is to provide greater protection for the FDMN and host communities through:

- Reducing the vulnerability to natural disasters
- Improving social service delivery system and providing better communication facility through physical interventions
- Improving water and sanitation facilities
- Reducing vulnerability to accidental fire
- Provisioning better educational facilities and
- Strengthening and scaling up of GBV prevention services to the FDMN

The project is jointly being implemented by Local Government Engineering Department (LGED), Department of Public Health Engineering (DPHE) and Ministry of Disaster Management and Relief (MoDMR) under their respective mandate and scope of works. Apart from the interventions in Addressing Gender and Social Inclusiveness and Preventing Gender Based Violence with the Support from UNFPA and building Communication and Awareness among all affected parties through an effective engagement of BCCP (Bangladesh Center for Communication Programs) in the areas, LGED is implementing a good number of infrastructural facilities, namely improvement of hat bazars, roads (both inside and outside of the camps), bridges, culverts, construction of School cum multi-purpose disaster shelters, Satellite Fire Stations, Relief Distribution Center, Community Service Center and many other different types of facilities. Given the project interventions, sensitivity of the areas and volume of people in or around the sites, the project is more likely to trigger certain Operational Policies and Bank Procedures, namely Environmental Assessment (OP/BP 4.01), Natural Habitat (OP/BP 4.04), Forest (OP/BP 4.36) and Physical Cultural Resources (OP /BP 4.11).

[1] ISCG: Situation Report Rohingya Refugee Crisis, (September 27, 2018)

[2] IOM Needs and Population Monitoring round 12 as of October 10, 2018

1.2 Elementary information of Work Package Component of W23.10

It is imperative to recognize proposed components under Work Package-23.10 in Ukhiya Upazila in order to assess and verify its interventions according to stipulated screening requisites from WB. Acknowledging this matter, such details are accounted for as given below in Table 1.2.1 along with visual presentation (General Upazila Map) given in Figure 1.2.1. Aerial map for this component is given in Appendix -5.

Table 0-1.2.1: Basic Featured Information of components [Sources of data: Field survey, 2020: DDC & LGED]

Component's name under W-23	GPS Coordinates	Distance from Upazila HQ	Union	Ward	Project Influence areas locations	Pre-existing condition of Road	Proposed Road type	Road dimension(m) (Length X Width) = Footprint (sq.m) *
Telipara - Mazerpar Road ID-422944050	**Starting Point** $21^0$16'39.0" N $92^0$07'16.0" E **Ending Point** $21^0$17'34.0" N $92^0$08'16.0" E	10 Km	Ratnapalong	1 & 2	Madborpara, Telipara, Kalarpara Afsar Baperpara & Majherpara	HBB	Bituminous Carpeting (BC)	(2320mX4.9m) = 11,368 sq. m

*Note: Roads are proposed to have average carriage way of 3.7m with 0.6m shoulder on each side; special conditions may prompt further adjustments while in construction period. However, footprint for roads is calculated with an average of 4.9 meters.

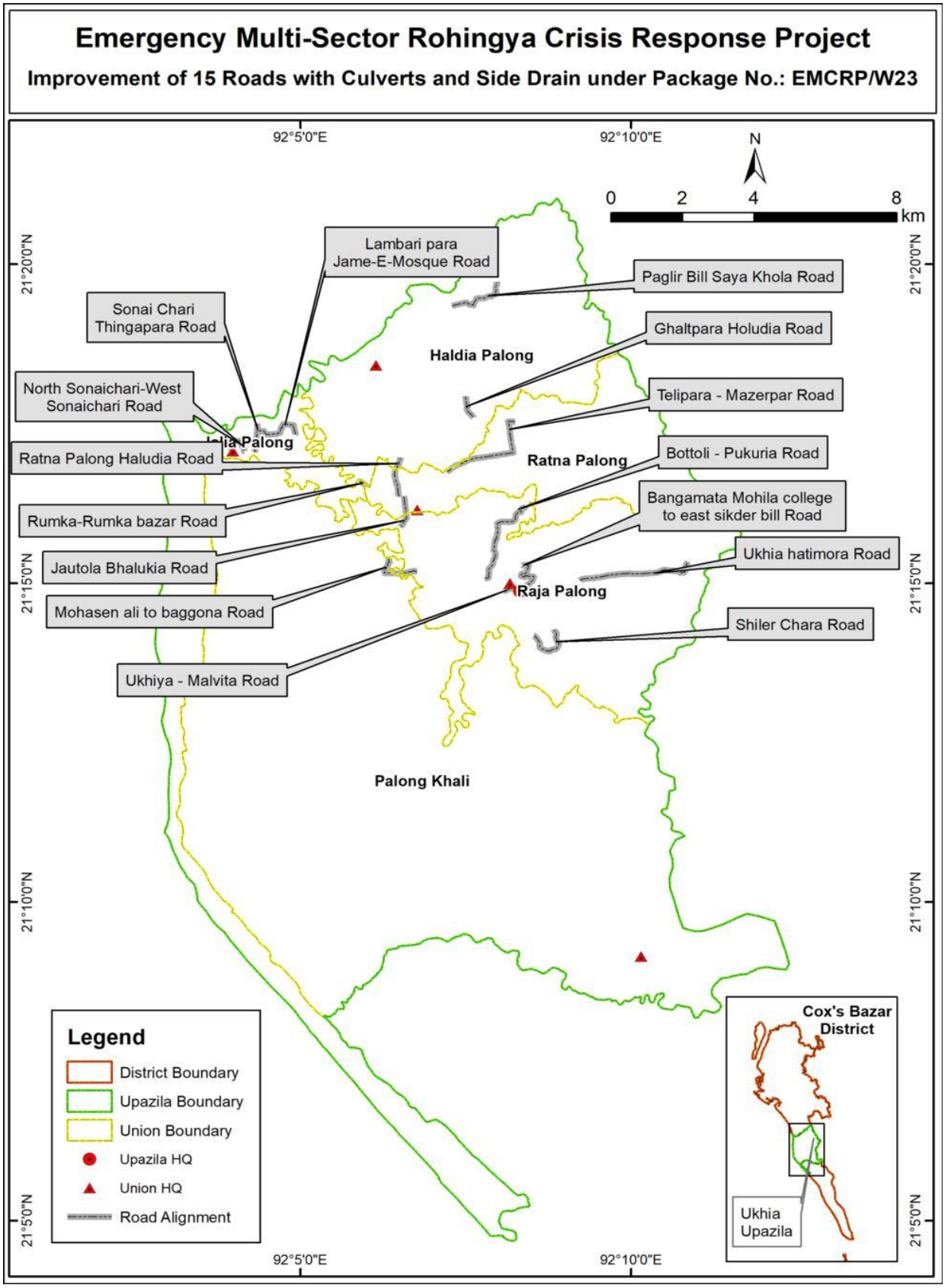


Figure 1.2.1: Map illustrating Telipara - Mazerpar Road ID-422944050location in the Ukhiya Upazila

1.3 Proposed intervention items for this component

The Telipara - Mazerpar Road ID-422944050 (W23/10) under work package W23 have been proposed with specific need basis dimensions to accommodate and ensure best quality interventions for local stakeholders. In context of governing environmental circumstances and geo-meteorological conditions, protection work items have been added to construction design for safety and sustainability of each proposed roads. These roads are abutting agriculture hence, construction and improvement works will descent these roads into new circumstances in some parts. These items have been included on the basis of field survey and analysis of these conditions. Please follow the table to acknowledge these items.

Table 1.3.1: Proposed safety interventions of component

W23-10: Telipara - Mazerpar Road ID-422944050
Construction of 15 nos. Cross Drain (dimension: 0.975mX 0.975m) at Ch. 12.0m, Ch. 725.0m, Ch. 746.0m, Ch. 956.0m, Ch. 1080.0m, Ch. 1195.0m, Ch. 1333.0m, Ch. 1442.0m, Ch. 1567.0m, Ch. 1679.0m, Ch. 1841.0m, Ch. 2097.0m, Ch. 2135.0m, Ch. 2160.0m & Ch. 2288.0m of chainage, construction of **04 nos. Box Culvert** (dimension: 2.0mX2.0m) at different Chainage and **01 no. Box Culvert** (dimension: 02-vent: 3.0mX3.0m) at Ch. 86.0m of chainage, construction of **42.0m Toe wall** and **46.0m (Brick) Palisading work** at different Chainage, Construction of **Earth** works, **Road safety** works and **Environmental Mitigation and Enhancement** works. Description of safety works and environmental enhancement works can be found in BOQ attached in Appendix-03.

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS

2.1 Methodology

Public participation and community consultation have been taken up as an integral part of environmental assessment process of the project. As part of the impact assessment, participatory public consultation was conducted in areas of concern for proposed roads by the field level staffs and consultants from PIU and D&SC. The consultation meeting was attended by disparate social groups representing local habitants, separate age groups, social class and occupations. In some cases, IUCN employees in charge of elephant watch tower were present where frequent elephant movements occur. The participants were also selected from different segments of stakeholders, and some of whom will have major active roles before, during and even after the construction works. Therefore, the meeting was organized in an informed, expressive and unbiased manner, wherefrom different views and concerns came across which will be properly taken care of during the design and construction phases. In order to serve our screening process, relevant items were thrown towards the audience to discuss and troubleshoot confusing or worrying matters regarding the proposed intervention under package work. Impacts in regards to environment, socio-economic matters during pre-construction, construction and post construction phase have been put forth. Possible mitigation measures and relevant needs have turned out during these sessions as well. Moreover, their comprehension as a stakeholder has been up lifted in light of project guidelines.

However, public consultation is a living process as the types of problems/ difficulties, involved parties or stakeholders and mode of settlement or resolution processes are more likely to differ with time. Thus, consultation with different parties or stakeholders will be continued throughout the sub-project implementation period and records of resolutions, whatsoever and wherever possible, will be kept in writing at the site and made available on any enquiries or requests by all parties concerned.

Most of the possible impacts under this component development have been put through review for locating impediments or possible adversity effecting future environment and socio-economic conditions. In order to comprehend surrounding features and impacts which may stipulate with it, screening has acknowledged having a Project Influence Area (PIA) of 0.5-kilometer radius. Sensitive findings have been identified if any, and relevant mitigation or minimization measures were suggested to subdue such complication for over the project construciton period. Moreover, evaluation was inspired to enhance environmental features and include monitoring initiatives under ESMP budget to ensure exertion of environmental improvement propositions. Contractor's responsibility has been taken into account while identifying possible impacts through sets of intervention accounts. These steps have been initiated strictly following ESMF guidelines and requirements. Environmental screening procedure was motivated by ingredients highlighted in Appendix-2 of ESMF. During survey, detail chainage length of the sub-projects was taken into account for detailing environmental and socio-cultural features within 100 meters buffer zone of both Left and Right side from the center line of the road. Longitudinal intervals of 300 meters have helped to identify positions of sensitive or near-sensitive socio-cutural features. These findings are illustrated in **Annexure-01**.

2.2 Important features/establishments within the PIA

Initial screening process is conducted through direct involvement of PIU and D&SC in the influence area of the proposed component, which allows to raise significant questions and ideas towards participants. In combination of both field walk-through and inputs of audience, a register of existing features is formed. Allow the following table to describe such elements in all the work package components.

Table 2.2.1: Important features within Project Influence Area for W23.10

Component's name under W-23	Direction	Important features/ establishment (approx. distance from the proposed site)
Telipara - Mazerpar Road ID-422944050	North	Telipara GPS (12m), Kalarpara mosque (50m), Pachardeba graveyard (200m), Afsar baperpara jame mosque (200m), Afsar baperpara Buddhist Mondir (500m), Majherpara jame mosque (500m), Ghatipara jame mosque (500m), Ghatipara GPS (750m)
	South	Jafor Pollanpara jame mosque & graveyard (400m), Jafor Pollanpara large graveyard (300m), Valukia GPS (500m), Valukia High School (525m)
	East	Thimchori GPS (300m), Thimchori mosque (350m), Valukia graveyard (500m), Valukia Harun Market (510m), Thimchori station (300m)
	West	Madborpara mosque (10m), Madborpara community clinic (10m), Sarderpara mosque (50m), Ghatipara Market (500m), Pethan Fokirer

Component's name under W-23	Direction	Important features/ establishment (approx. distance from the proposed site)
		mosque (700m)

2.3 Issues and Recommendations raised by the Participants

After inauguration has set in motion, their valuable opinions and remarks came pouring out. At this point, we find our field base knowledge for assessment attributed impact degrees and possibilities. Please follow the table 2.3.1 given below to recognize participants' inputs arranged in relevance with this component. Consultation meeting summary, attendance sheets and pictures of separate meetings with proposed location for this subproject component can be found in Table 2.3.2 and Annexure-02 and Annexure-03 respectively.

Table 2.3.1: Issues and Recommendations raised by the Participants

COMPONENT'S NAME UNDER W-23.10	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
TELIPARA MAZERPAR ROAD ID-422944050	• In Madborpara, Telipara, Kalarpara, Afsar baperpara & Mazerpara villages area, this proposed road is previously HBB developed. • Big vehicles cannot use this road due to having short crest. In some occasions, big vehicles move over towards open fields adjacent of this road in order to pass through •Possible dust and noise pollution during the construction works. •Safety of children and adults at the sites during construction works. •Elephant movement is not present. •Local community wish to have a better drainage system along with the road in order to allow waters from higher grounds to find an uninterrupted pathway not causing harm to nearby households or agriculture fields and wash away top soil of adjacent grounds residing alongside the road. It will protect the top soil for future growth of crops and aid vegetable farming or homestead gardens. •The participants have expressed their greater interest for this intervention and believes this will bring nothing but prosperity for the entire catchment dwellers. •Household fences along the road	• Existing community feel this improvement with BC is highly needed for them to ensure quality road for better communication facility. This road has very unsettling conditions in some parts which makes the road risky for three wheelers to pass. • Local people considered that the selected site is suitable for the construction of this road from both the technical and social-environmental (Direct savings in the cost of operating vehicles, time savings by travelers and freight, wider effects can less accident rates, this road is waterproof and also dust free, much more durable) point of view. It will provide better mobility and access to services in due time. •The road should consider water flow during rainy seasons thereby ensuring the construction is not affected by mass water flow. •Enough pathway is expected for vehicle movement so that comfort travel is achieved. •Construction site safety should be ensured to avoid any mishaps or accidents during work periods. •They considered small lumbering and suggested tree plantation initiatives. •They also requested to involve the local community to construction work and they will welcome any outside key labor. •During construction period, alternate route to pass through this area is available. •Since the road is passing alongside homestead gardens and agriculture fields, the intervention will invite air pollution on moderate level during construction period. However, preventive actions and

COMPONENT'S NAME UNDER W-23.10	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
	should be affected while construction and these should be adjusted during construction period • No trees should be harmed for preparation of this road • Available pathway to usher material delivering vehicles • Labor shed availability in the target location • Material storage is available	measures can be taken to keep air quality from degrading. •Priority for jobs should also consider women. •Participants, made certain that they will provide surveillance over raw materials and material storage area. •They have also ascertained that the selected site is free from any events related to resettlement and major environmental impacts. The adverse environmental impacts that may come in the way of air quality, noise, solid waste, occupational health & safety during the construction period, and will be of short duration, yet proper management/conservative options should be adopted. • Open spaces are available along the road which can be used for material storage and labor camp. • Electricity is available and contractor can install tube wells as deemed necessary.

Table 2.3.2: Consultation Meetings Summary

Road Package Number	Date DD-MM-YYYY	Venue	Main Participant Groups	No. of Participants	Remarks (If any)
W23-10	06-10-2020	Infront of Telipara GPS	Host Community	16	---

3. ENVIRONMENTAL SCREENING

3.1 General

This section identifies the potential impacts that the various elements of the proposed Project may have on the physical, biological and socio-economic environment within half a kilometer of the radial distance around the site. Environmental Assessment (EA) based on this screening study for the Sub-project has been conducted to identify and determine which potential Project impacts may be significant and therefore require the application of reasonable and effective management and/or mitigation measures.

In order to realize the exact physical, biological, socio-economic and environmental impacts of the proposed sub-project sites and the influence area in regards to the implementation measures, an extensive field visit was carried out in each proposed sub-project PIA. Environmental Screening form, as adopted in **Appendix 2** of the Environmental and Social Management Framework of EMCRP, was administered for identifying the impacts and their extents.

The screening data and information for this subproject component and details screening summary have been formulated and shown in **Appendix-01.**

3.2 Major Findings

A complete view of current environmental conditions of individual sub-projects in relation to interested queries has been congregated in order to understand the degree of impacts corresponding with marked interventions. Interestingly, most sub-project has correspondence with its surrounding features and upholds interchangeable impacts. However, the degree is not an interchangeable factor since scale is not parallel to each of these components which is where, mitigation measure differentiation is implied. There are some cases where unique circumstances have been met with while environmental screening took place which is also accounted for and should be a matter of concern for other parts of the ESMF initiative. The significant issues observed for this subproject component is enlisted in following Table 3.2.1 with pertaining impacts. Moreover, impacts that are adventitious has also been embraced for promoting best practices.

Table 3.2.1: Concerning environmental issues relating to each proposed subproject and influence area for W23.10

COMPONENT'S NAME UNDER W-23.10	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
TELIPARA - MAZERPAR ROAD ID-422944050	It is not located within any major environmentally sensitive area.	It will not cause any severe negative effects to the environmental settings of the area neither to important environmental features.
	Construction period will induce air pollution while preparing for bitumen and loading-unloading raw materials. Impacts on air quality during the construction phase may turn to negative. The main impacts include dust generation from crushers, vehicles and the transportation of all types of construction materials.	It will invite waste production which may in turn cause minor air pollution due to deposited dust and airborne particles less than PM_{10}. Dust pollution may slightly suffocate photosynthesis however this can be minimized through regular water sprinkling as suggested in ESMP.
	Noise emission from construction machineries and equipment can cause nuisance to local residents and workers.	The ambient noise level might have potential to increase temporarily and intermittently in the close vicinity of active construction fronts.
	No small hill (tila), fish farming and significant vegetation coverage is located in the ROW nor does it stand over such items. Nonetheless agriculture fields, bamboo bushes and homestead gardens/forest are found beside the road.	No agriculture land or any forest coverage will get degraded or lost for construction. Liquid waste such as left-over oils or chemicals might run into these adjacent features.
	Construction works will involve chemical usage and preparation of on-site add-ons to the road. Generating scraps and residues.	The runoff from work site may enter existing water body and frustrate the water quality which will be acute however.
	Few amounts of bush (sapling) clearings may need cutting at different chainage.	No severe damage will occur or damage to

COMPONENT'S NAME UNDER W-23.10	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
		habitat will be faced. It can be managed by introducing small plantation incentives around the proposed location.
	Elephant Movement not present	No impacts
	No heavy earth excavation work will be involved.	Consequently air, noise and dust pollution will be occurred within a small-scale during construction period only.
	Construction related activities and setting up of labor camps along with associated facilities and their management can cause adverse impacts.	Noise pollution from mixing or grinding, air pollution caused by dust or gaseous emissions from vehicle movement, running of motorized equipment and land clearing, odors and soil pollution from leaking of latrines and fecal sludge, will more likely to take place.
	Chemical spills or improper disposal of construction waste materials due to lack of worker training and misconduct of contractor's safety initiatives.	During the construction period, soil may get contaminated from activities such as handling of hazardous construction materials (such as fuel, lubricants, paints, and solid waste and sewage).
	Vibration effects generated from mixing, grinding, pilling, drilling or other construction works	Any vibration would result in nuisance effects to nearby faunal species, and but will be localized and temporary and will unlikely to result in structural damages to buildings or walls of the adjacent private properties.
	Sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site are at north side Telipara GPS (12m), Kalarpara mosque (50m), Pachardeba graveyard (200m), Afsar baperpara jame mosque (200m), Afsar baperpara Buddhist Mondir (500m), Majherpara jame mosque (500m), Ghatipara jame mosque (500m), Ghatipara GPS (750m), at south side Jafor Pollanpara jame mosque & graveyard (400m), Jafor Pollanpara large graveyard (300m), Valukia GPS (500m), Valukia High School (525m), at east side Thimchori GPS (300m), Thimchori mosque (350m), Valukia graveyard (500m), Valukia Harun Market (510m), Thimchori station (300m) and west side Madborpara mosque (10m), Madborpara community clinic (10m), Sarderpara mosque (50m), Ghatipara Market (500m), Pethan Fokirer mosque (700m).	No disturbance to all these establishments/features is anticipated due to construction activities for the sufficient distance from the construction site, and strict construction site management system-including restrictive work schedule during the daytime only, water-sprinkling twice a day on and around the site, safe storage of materials, etc.

A few incidents of human elephant conflict have been reported in 2018. The IUCN has conducted a study on such conflict. With the support from UNHCR, IUCN has been marking elephant routs and corridors and informing local communities and stakeholders of avoiding the marked areas. As part of the mitigation options, different initiatives have been undertaken, such as formation and capacity

development of Elephant Response Teams (ERTs); providing equipment to ERTs to divert in-coming elephants; and setting up elephant deterrent tools (e.g. trip alarms and watch-towers). Though the current chances of occurrence of conflicting incidence are zero, any recurrence would be managed by the ERTs and they will be called if there appears any minute possibility to recur. A map of elephant movement is given in Annexure 04.

In order to offset the loss or attenuating the environmental degradation, a set of mitigation measures will be adopted, on top of general practice of standard construction procedure or following the relevant codes of practices.

3.3 Climate Change Impact Screening

3.3.1 General Overview of the area

Cox's Bazar is one of the coastal districts of Bangladesh and is prone to the effects of climate change due to its geomorphological siting and climate induced effects. The hilly tracts of Cox's Bazar could foster further environmental crisis brought on by indiscriminate deforestation and diminishing groundwater reservoirs, which have been taken place in recent months as the Rohingya crisis evolved. A recent study conducted by World Bank[3] has found that Cox's Bazar will be the worst-hit district in South Asia as average temperatures rise and rainfall patterns become disruptive, by 2050, if greenhouse gas emissions continue unabated.

The hilly region of the country, especially the part in Cox's Bazar is characteristically of muddy soil structure, not of any rocky formation and the stability comes from the roots of the trees. Also rainfall, proximity to the sea, elevation, and land cover are very important factors for analyzing the risk of cyclone. Denudation of trees from hilltops in order for the huge settlement of Rohingya people has already increased the vulnerability to the risk of hill collapse by destabilizing the terrain. Also deforestation at a rapid speed uncovers the land and raise the risk of occurrence of cyclones, as forests protect land from high wind and storm surges where demolishing the trees would make the area vulnerable.

Together with the above-mentioned hazardous situation, again due to sudden extraction of huge amount of groundwater, availability of potable water from shallow tube wells that pump water up from about 150 feet has already reached to a critical level. Averting the problem requires new tube wells to be plumbing deeper into the poorly mapped aquifer, but going deeper than 700 feet in some places may cause salt water to contaminate freshwater resources.

In this case, it is possible that a stationary position of the freshwater-saltwater transition zone can be established via proper management of pumping in the confined aquifer.

The groundwater resource is seen to suffer more from the climate change impact. The impact on groundwater due to climate change impact include

[3] https://openknowledge.worldbank.org/bitstream/handle/10986/28723/9781464811555.pdf

- Sea-level rise could result in a transgression of the sea and a loss of land area. This could also lead to the secondary effect of population migration in the new coastal band due to migration of the coastal population from the encroaching sea, thereby increasing domestic water needs in the new coastal area.

- Transgression of the coast implies that saline storm surges of 1 or more meters depth would penetrate beyond the new coast to new land areas. Storm surges transport saline water far inland of the coast and much of this floodwater may infiltrate the ground in areas where the aquifer is not fully saturated. Even where the aquifer is saturated, denser saline water may sink into the aquifer during the flood and later from pools of saltwater that remain following the flood[4].

- It has been identified that the salinity is found in the shallow aquifers along the coastline. So the salinity which are found in the groundwater are of lesser concern as salinity will subside over time

- Several researches show that through modeling of groundwater flow that the depletion of groundwater in the host community will persist up until 2022 and the replenishment of water will take place.

Considering the general climate change effects in Cox's Bazar area and offsetting the aggravating environmental situation due to the mass arrival of Rohingya communities, several specific measures including tree planation in sub-project areas, rainwater harvesting from every disaster shelter, construction of drainage facilities along the road length and installing thunder arrester across the areas, have been suggested and will be implemented.

3.3.2 Site Specific Screening and outcome

Climate Change impact on a particular subproject is tough to deduce as the highest resolution of climate model simulation done over Bangladesh is 50km. Depending on the simulation ensemble of Cox's Bazar district, the temperature and precipitation are likely to increase with time.

Site specific climate change impacts are often not so easy to measure or deduce plausibly while the site is confined to a narrow strip of roadways, and associated mitigation or offsetting measures are really hard to plot on the impact areas, though an overall set of measures are often considered in practical aspect. Fig:1 shows the inundation risk map of the subprojects under W-23, none of the subprojects are in vicinity of the severe river flood inundation area. So the risk of flooding is low around the sub-project area

[4] "Implications of Climate Change for Fresh Groundwater Resources in Coastal Aquifers in Bangladesh", World Bank report.2010

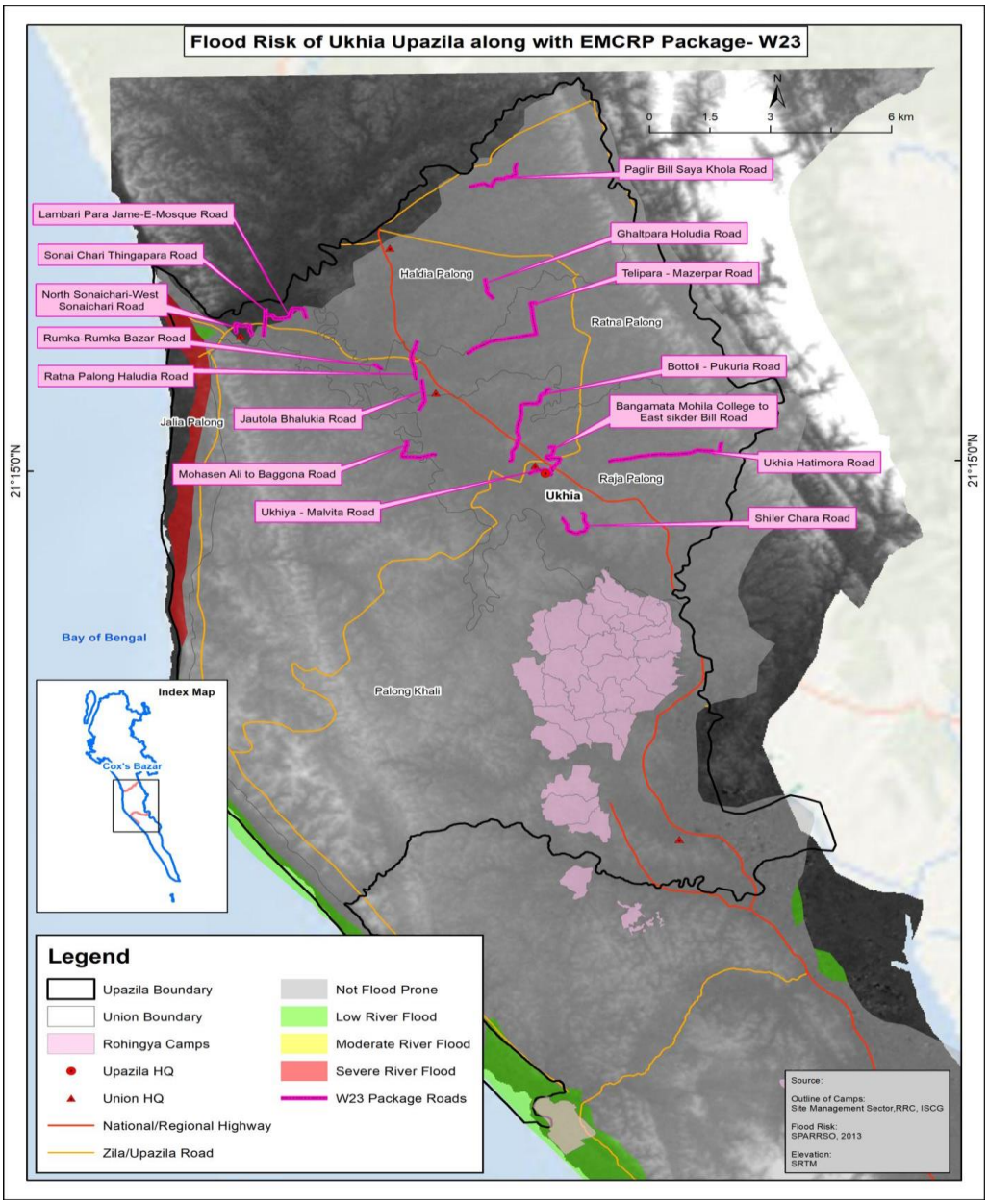


Figure 3.3.2.1: Flood inundation risk map near the subprojects.

Also, in order to avoid the devastation caused by the thunderstorm, state-of the-art thunder arrester (lightning protection system) has been suggested to install having a coverage area of 25,434 sq.m for a single arrester. In addition, tree planation on the road slope/ within the premises is also suggested to sooth the temperature effect and increase the water retaining capacity of soil, at the same time.

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

4.1 General

Considering the environmental settings of the sub-project area, it can be assumed that possible impacts would be largely construction-related, and could be addressed through adoption of good engineering practices; good housekeeping; better *in-situ* construction materials management; and observance of health and safety protocols during the implementation period.

Table 4.1.1: Site Specific Impact and Mitigation Plan under package W23.10

Component's name under W-23.10	Impacts	Mitigation plan
Telipara - Mazerpar Road ID-422944050	Telipara GPS (12m), Kalarpara mosque (50m) to the north and Madborpara mosque (10m), Madborpara community clinic (10m), Sarderpara mosque (50m) to the west. Further, some settlements located adjacent to the sub-project area might get affected during the construction period with the generated debris and dust, though for the time being.	Contractor must adhere to the best practice debris management procedure and regular adoption of dust control measures (spraying of water at least twice a day) to minimize the effect to the level best.
	Proposed subproject area arises water logging problem during the monsoon sometimes. On the other hand, some part of the proposed road is passing by the agricultural land. Box culvert and cross drain will be constructed to terminate rainwater for one side to another side during rainy season and also help for rapidly remove excess soil water to reduce or eliminate waterlogging during monsoon and return soils to their natural field capacity and will help to maintain the water balance of both roadside agricultural land to provide a sustainable irrigated agricultural system. It will also help to prevent flood and not to allow water to overflow and also help to divert water for farming. Some low land is found beside the proposed road so protection wall and palisading work will be constructed during construction period for used to "correct" the natural slope. There are points on the road where slope preparation cannot be done due to having low lying agriculture lands and water bodies. Slope preparation refers to resettlement issues as well in those locations. In such cases Toe Wall is proposed which helps to restrain the horizontal surface pressure. This is an adaptation technique and a precaution measure to not allow any damage to sideline existing low-lying features. There are low lands along the road where agriculture fields and ponds are present. This also excludes high chance of soil quality degradation.	Proposed safety structures are **15 nos. Cross Drain** (dimension: 0.975mX 0.975m) at different chainage and **04 nos. Box Culvert** (dimension: 2.0mX2.0m) at different Chainage and **01 no. Box Culvert** (dimension: 02-vent: 3.0mX3.0m) at Ch. 86.0m of chainage, **42.0m Toe wall** and **46.0m (Brick) Palisading work** at different Chainage, **Earth** works, **Road safety** works and **Environmental Mitigation and Enhancement** works.

Further construction related activities which may result in adverse impacts in the surrounding environment of the sub project component must be kept under close consideration and appropriate mitigation and management measures will be taken with due care and vigilance. Once the effects are minimized to its least level and controlled efficiently, it will turn into a welcoming and beneficial project for the local communities. The component specific environmental management plans have been outlined in **Appendix-2**. The mitigation measures as well as monitoring program of ESMP have also been incorporated in the management plan.

Environmental quality enhancement: Under the additional financing to the EMCRP project, Forest Department of the Government of Bangladesh will afforest along 200 km of road length area, primarily under the Ukhiya and Teknaf Upazila of Cox's Bazar district in order to offset the environmental and ecological devastation, that had been occurred due to the evolution of Rohingya Crisis, to an achievable level. Many of these road lengths will go through and by the Rohingya Camps, up on the hill and are already denuded of trees or vegetation. Local Government Engineering Department (LGED) will allocate and channelize the finance to the Forest Department under the said additional financing component and oversee the progress of works with due diligence. However, this enhancement work will improve the environmental quality of the area and reinstate some parts of the ecosystem services to those areas, though primarily.

4.2 Health and Safety Measure under COVID Situation

Apart from the established Occupational Health and Safety (OHS) measures being followed in construction sites, offices, and labor camps, a set of additional measures has to be taken and practiced throughout the daily cycle by each labor, staff and any involved parties, due to the ongoing pandemic coronavirus situation. Staffs and consultants at PIU and D&S, along with the pool of consultants under different firms/agencies for different services, and all the representatives or staffs of construction contractors and suppliers have to play much sensitive, (pro-) active and responsible roles in abiding by the rules and measures by themselves and getting the involved workers and different stakeholders adhered to the same. A detailed guideline containing a set of measures with shared responsibilities has been sketched out in order to fight the exposure and further spread of this potentially fatal situation. This plan or guideline shall constitute an integral part of ESMP measures for every sub-project, though is not included in this report to keep it concise and specific, and the contractor is required to keep the copy of that guideline at every site office.

However, among many other relevant issues, the guidelines emphasize on following line of directives:

a. Contractor must designate one of his employees as H&S/Safeguards supervisor to lead, coordinate and interface in order to fight the COVID 19 situation under the direct guidance of COVID focal at PIU of EMCRP project.
b. All workers, supervising and supporting engineers and staffs, consultants, service providers and other concerned parties must adhere to the personal health and hygiene rules, social distancing, and other protective measures in full in order to protect themselves and contain the infections any further. Necessary training and awareness campaign will be aligned with the specific sub-project scenario and prevailing conditions.

c. General practice of cleaning and hygiene has to be maintained in all project/site offices and camp sites, and supply of necessary PPEs and cleaning /disinfecting materials along with proper use of those is to be ensured.
d. Public consultation and stakeholder engagement are to be carried out considering the prevailing risks of virus transmission in the target areas, scope of interventions and level of ICT penetrations among the target stakeholders, and so on.
e. Necessary protocols have to be established and maintained in case of handling a sick employee or worker, and appropriate compensation to a sick disengaged labor is required to be given with due documentation.
f. Budgeting for suggested protective measures, along with necessary supervision and monitoring for the required interventions has to be ensured.

Following the additional health and safety measures presented in that guideline, sub-project component specific BOQ items have been inserted to supplement the budget considering the country-specific situation, capacities, and scope of interventions. The additional cost to Health and Safety Measures under COVID 19 situation is shown in **Appendix-3.**

4.3 Cost of Environmental Enhancement Works in BOQ

In consideration to the above-mentioned environmental impacts and their mitigation measures for this sub-project component, a set of items are included in the BOQ of this sub-project component. Social Safeguard Personnel for Environmental and Social Management for Work Package EMCRP/W23 has also been added in the whole BOQ in order to take supervision and leadership to organize Environmental Management under Environmental Enhancement Works. The total costing and estimation have included enhancements such as Grass turfing plans, Tree plantation initiatives, Dust Suppression mechanisms. On the other hand, in order to ensure health safety and sanitary measures of workers PPE, First Aid Box, Labor shed, Environmental management, drinking water facility with water tests, Temporary latrine for both male and female as well as waste disposal systems has been accounted for. Ensuring sustainable labor performance in regards to environmental and social considerations motivational training has been taken into account. An overview of the estimation is given below and the detailed estimated cost to implement the ESMP is shown in **Appendix-3**.

5. LIMITATION OF THIS STUDY

Bangladesh government has imposed a nationwide lockdown to curb the spread of the novel coronavirus in the wake of series of deaths and infections. Authorities declared a ban on passenger travel on all sector from March 24 while all public transport on roads have been suspended from March 26 to stem the spread of virus, officially known as COVID-19. All office works have been postponed and an intended visit to the sites for further consultation with the relevant stakeholders has had to cancel due to this crisis. Therefore, some relevant information and arrangement needs waiting for recovering this pandemic crisis.

6. CONCLUSION AND RECOMMENDATIONS

The overall conclusion is that if the mitigation, compensation and enhancement measures are implemented in full, there will be no significant negative environmental impacts in regards to the selection of location, design, construction, and/or operation procedure of the proposed component. There will in fact be tremendous benefits from recommended mitigation and enhancement measures and major improvements in quality of life, opportunities in business, trading jobs and ensuring social safety and security will be achieved once the scheme is in operation.

The conclusions of the Screening study can be summarized as follows:

- The communities will receive large benefits through improved infrastructural facilities, transportation & communication etc.
- The short-term negative impacts that may come by the way of air quality, noise, solid waste, occupational health & safety need to be minimized through the management plan.
- The project will create employment for those who live in the vicinity of the construction site and will provide them a short-term economic gain.
- The green belt development, if necessary, for the road site, with large-growing trees at the periphery of the site will give the places a more natural and pleasing appearance.
- A comprehensive Environmental and Social Management Plan (ESMP) has been prepared to mitigate and reduce the adverse impacts that will come out from the Subproject activities.

Implementation of this component will have large positive impacts to the communities in terms of improved infrastructural transportation & communication facilities, which would eventually develop the socio-economic condition of the catchment areas. So, strong recommendation should be put in place to implement the sub-project within shortest possible period of time, and with great care and efficiency.

Annexure-01: Important Environmental Features (IEFs) near site

Detail Environmental features within 100m of the both sides from the center line were collected @300m longitudinal intervals. The findings of the survey for the aforementioned road can be seen in the table below:

Table: Detailed Chainage length and features of the Sub-Project component

Road Name	Telipara - Mazerpar Road ID-422944050 **(W23-10)**	**Total Chainage**	2320.0m

Chainage (m)	**Left**	**Right**	**Features**
000-300	L		Ditches, shops, brick boundary wall, mosque, bamboo fence, electric pole, community clinic, paddy land, betel nut garden, tin shed fencing, tin shed household, electric pole, paddy land
		R	Bill board, paddy land, tin shed fencing, building, paddy land, culvert, household connecting road, paddy land culvert
300-600	L		Paddy land, culvert, ditch, playground
		R	Paddy land, culvert, household connecting road
600-900	L		Paddy land, connecting road, shops, brick boundary wall, primary school, connecting road, tin shed fencing, betel nut garden, raintree, tin shed fencing, wire fencing, household, betel nut garden, brick boundary wall, mosque, connecting road
		R	Bamboo fencing, betel nut garden, bamboo fencing, household, shop, paddy land, culvert, wire fencing, pond
900-1200	L		Paddy land, local drain, household connecting road
		R	Pond, paddy land, bamboo fencing, tin shed fencing, tin shed household, big tree, tin shed fencing, brick boundary wall, paddy land
1200-1500	L		Paddy land, culvert, bamboo fencing
		R	Paddy land
1500-1800	L		Betel leaf yard, shop, bamboo fencing, betel nut garden, bamboo fencing, tin shed household, Paddy land, bamboo fencing, betel nut garden, tin shed household, brick boundary wall, tin shed household, betel nut garden, brick boundary wall
		R	Paddy land, big tree, bamboo fencing, betel nut garden, bamboo fencing, tin shed household, tin shed fencing, electric pole, tin shed fencing, betel nut garden
1800-2100	L		Brick boundary wall, paddy land, tin shed house hold, brick boundary wall, bamboo fencing, betel nut garden, household, tin shed fencing, tin shed household, tin shed fencing, building, bamboo fencing, brick boundary wall, betel nut garden, vegetables garden
		R	Bamboo fencing, betel nut garden, paddy land, RCC pole with wire fencing, betel nut garden, household connecting road, open space
2100-2320	L		Bamboo fencing, vegetables garden, paddy land, vegetables cum betel nut garden, electric pole, vegetables garden, betel nut garden
		R	Bamboo fencing, tin shed household, betel nut garden, tin shed fencing, bamboo bushes, pond, bamboo fencing, tin shed household, betel nut garden

Annexure-02: Attendance of consultation meetings for W23/10

EMCRP/23.10

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)

Local Government Engineering Department (LGED)

Public Consultation Participants List

Focus Group Discussion

১	[illegible]	২০	✓	[illegible]	[illegible]
২	[illegible]	২২	✓	[illegible]	[illegible]
৩	[illegible]	২২	✓	[illegible]	[illegible]
৪	[illegible]	২৪	✓	[illegible]	[illegible]
৫	[illegible]	৩৬	✓	[illegible]	[illegible]
৬	[illegible]	৪৫	✓	[illegible]	[illegible]
৭	[illegible]	২৮	✓	[illegible]	[illegible]
৮	[illegible]	৫৪	✓	[illegible]	[illegible]
৯	[illegible]	৬০	✓	[illegible]	[illegible]
১০	[illegible]	২৪	✓	[illegible]	[illegible]
১১	[illegible]	২৮	✓	[illegible]	[illegible]
১২	[illegible]	২০	✓	[illegible]	[illegible]
১৩	[illegible]	৫০	✓	[illegible]	[illegible]
১৪	[illegible]	২৭	✓	[illegible]	[illegible]
১৫	[illegible]	৪০	✓	[illegible]	[illegible]
১৬	[illegible]	৫৫	✓	[illegible]	[illegible]

Figure: Attendance of consultation meeting for W23-10

Annexure-03: Pictures of sub-project component location and surrounding features with public consultation



Starting point of Telipara - Mazerpar Road



Existing culvert and paddy land on the way to the road



Telipara GPS and shop on the sides of the road



Boundary wall and paddy land on the sides of road



Betel nut yard on the both sides of the road



Consultation meeting with local community

Figures: Present condition of Telipara - Mazerpar Road (W23-10) & Public Consultation meeting with Host community

Appendix-1: Environmental Screening Form for examining sub-project component
Environmental Screening Form for Sub-project W23-10

Sub-Project Description Form:

Name of Sub-Project: (Improvement of 15 Roads with culverts and side drain under Cox's Bazar District. EMCRP/W23).

Name of the component: Telipara - Mazerpar Road ID-422944050

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Estimated total cost of sub-project (in Taka): 417,036,298.10 Tk.

Estimated construction period duration: 1 year

Estimated total cost of the component (in Taka): **34,356,028.29 Tk.**

Estimated Operation and Maintenance period (life of sub-project): Project design life more than 15 (Fifteen) years but Government policies on how long projects can operate in the camps.

District: Cox's Bazar **Sub-District**: Ukhiya **Union**: Ratnapalong

Name of Community/Local Area: Madborpara, Telipara, Kalarpara Afsar Baperpara & Majherpara

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):

The Sub-Project is categorized as a village road and improvement with Bituminous Carpeting (BC) options. For drainage of rain water construction of **15 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 12.0m, Ch. 725.0m, Ch. 746.0m, Ch. 956.0m, Ch. 1080.0m, Ch. 1195.0m, Ch. 1333.0m, Ch. 1442.0m, Ch. 1567.0m, Ch. 1679.0m, Ch. 1841.0m, Ch. 2097.0m, Ch. 2135.0m, Ch. 2160.0m & Ch. 2288.0m of chainage, construction of **04 nos. Box Culvert** (dimension: 2.0mX2.0m) at different Chainage and **01 no. Box Culvert** (dimension: 02-vent: 3.0mX3.0m) at Ch. 86.0m of chainage, Due to the low land in different chainage for protection work of the road construction of **42.0m Toe wall** and **46.0m (Brick) Palisading work** at different chainage will be constructed as well as for **Earth** works, **Road safety** work and **Environmental Mitigation and Enhancement works** has been included in the estimation.

Estimated footprint / land area for this sub-project is 11,368 sqm.

Brief description of sub-project site: (e.g. present land use, Important Environmental Features (IEFs) near site, etc.:

This proposed Telipara - Mazerpar Road belongs to Madborpara, Telipara, Kalarpara Afsar Baperpara & Majherpara villages at Ratnapalong union, Ward-1 & 2 under Ukhiya Upazila. This road has started from Courtbazar-Valukia BC road stretching 2320 meters from South side to East side, along with ancillary connecting road, boundary fencing, playground, GPS, shop, settlements, trees, mosques, household connecting road, agriculture fields, electric pole, homestead garden etc.

Overall Comments

The proposed component of the sub-project (Road improvement) is not located within any remarkable environmentally sensitive area and will not cause any severe affect to the environmental settings of the area, thus not going to create intimidation to important environmental features. No drainage congestion/water loggings have been observed in the road area. But, some local trees like betel nut tree, bushes etc., or additional vegetation may need to clear out due to construction activities, with appropriate offsetting measures to be taken. No agricultural productive soil will be used for the purpose. Earth will be compacted for stabilization. The inputs will be mainly at construction phase and limited within project boundary. Moreover, mitigation measures will be taken according to the ESMP for minimizing the air, dust and noise pollution.

It has been revealed that this project's scopes of works do not intend to overtake their area of lodgment and funding entity has no intention to do so. Moreover other issue has also been brought to their attention that drainage system and a bridge have also been included into the evaluation of this project since runoff from higher grounds are also a concerning matter during rainy season.

People of the subproject area are very much optimistic about the success of the project and are also eager to participate in the project activities. The subproject is environmentally sustainable and socially acceptable. The local community attended in the participatory public consultation meeting. Their community representatives as teachers, shop owners, farmers and elders have no objection to the construction this infrastructure in the proposed site; the community also appreciated the initiative of LGED to ensure safe access and better portability. The public consultation meeting results confirmed that improvement of this road will increase socio-economic interest in the communities and make lives easier for these people. They also requested to construct the road in accessible width so that small auto and motor vehicles can pass easily. Water flow from undulated terrains is a factor that should be considered for construction because 1 week worth of rain invites water flow which makes this surrounding area logged in several places. On another matter, locals requested to involve the local community to construction works and material storage monitoring duties.

The road is not located within any identified environmentally sensitive area, and therefore, does not seem to cause any adverse impact on the important environmental features. No significant impact is expected on the ecosystem and biodiversity, no agricultural land/ activities or fish farming will be disturbed, due to the construction of the sub projects.

Types of waste to be generated during construction and operation phase:
During construction period solid waste will be generated due to construction activities. The types of wastes are brick pit, unused sand, wood, gravels, bitumen etc. The types of wastes are gravel, stones, rock, wood, copper wires, concrete, iron, plastic etc. Negligible amount of plastic will come as residue. Moreover, liquid waste will include chemicals of bitumen leftovers, motor oils, used oil, Degreasing solvents etc. Human wastes and kitchen wastes will be generated from labor camps as well.

Sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site including elephant migration routes and remaining forests:

Within the influence area of the subproject no historical sites were identified. This sub-project is situated within Madborpara, Telipara, Kalarpara Afsar Baperpara & Majherpara villages at Ratnapalong union, Ward-1 & 2 of Ukhiya Upazila, Cox's Bazar. Some sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site are at north side Telipara GPS (12m), Kalarpara mosque (50m), Pachardeba graveyard (200m), Afsar baperpara jame mosque (200m), Afsar baperpara Buddhist Mondir (500m), Majherpara jame mosque (500m), Ghatipara jame mosque (500m), Ghatipara GPS (750m), at south side Jafor Pollanpara jame mosque & graveyard (400m), Jafor Pollanpara large graveyard (300m), Valukia GPS (500m), Valukia High School (525m), at east side Thimchori GPS (300m), Thimchori mosque (350m), Valukia graveyard (500m), Valukia Harun Market (510m), Thimchori station (300m) and west side Madborpara mosque (10m), Madborpara community clinic (10m), Sarderpara mosque (50m), Ghatipara Market (500m), Pethan Fokirer mosque (700m). Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists.

Some human settlements and agricultural land are found around the sub-project area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). Elephant migration routes were about 14-15 km away from this sub-project. No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below:

Section A: Sub-Project Overview

Description of sub-project/component interventions:
The Sub-Project is categorized as a village road. Based on field survey, this sub-project involves of Herring Bone Bond (HBB). According to the design this sub-project will be developed with Bituminous Carpeting (BC) from Ch. 00 to Ch. 2320.0m.

<u>Subproject interventions:</u>

- **Bituminous Carpeting (BC)** options.
- **15 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 12.0m, Ch. 725.0m, Ch. 746.0m, Ch. 956.0m, Ch. 1080.0m, Ch. 1195.0m, Ch. 1333.0m, Ch. 1442.0m, Ch. 1567.0m, Ch. 1679.0m, Ch. 1841.0m, Ch. 2097.0m, Ch. 2135.0m, Ch. 2160.0m & Ch. 2288.0m of chainage
- **04 nos. Box Culvert** (dimension: 2.0mX2.0m) at different Chainage and **01 no. Box Culvert** (dimension: 02-vent: 3.0mX3.0m) at Ch. 86.0m of chainage
- **42.0m Toe wall** at different Chainage
- **46.0m (Brick) Palisading work** at different chainage
- **Earth** works,
- **Road safety** works and
- **Environmental Mitigation and Enhancement** works (description of such items can be found in BOQ)

Sub-project Location:

Important Features	
ID	422944050
District	Cox's Bazar
Upazila	Ukhiya
Union	Ratnapalong
WARD	1 & 2
Total Chainage	2320m
Proposed Chainage	2320m
Road Type	Village Road
Proposed Intervention Type	Bituminous Carpeting (BC)
Road Starting Point Coordinates	Latitude: $21^0$16'39.0" N Longitude: $92^0$07'16.0" E
Road Ending Point Coordinates	Latitude: $21^0$17'34.0" N Longitude: $92^0$08'16.0" E

Land ownership

Land is owned by Government.

Expected construction period: 1 year

Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water bodies, etc. and historical or socio-cultural assets): Please also explain any analysis on alternative location was conducted:

Some existing interventions within the sub-project location at north side Telipara GPS (12m), Kalarpara mosque (50m), Pachardeba graveyard (200m), Afsar baperpara jame mosque (200m), Afsar baperpara Buddhist Mondir (500m), Majherpara jame mosque (500m), Ghatipara jame mosque (500m), Ghatipara GPS (750m), at south side Jafor Pollanpara jame mosque & graveyard (400m), Jafor Pollanpara large graveyard (300m), Valukia GPS (500m), Valukia High School (525m), at east side Thimchori GPS (300m), Thimchori mosque (350m), Valukia graveyard (500m), Valukia Harun Market (510m), Thimchori station (300m) and west side Madborpara mosque (10m), Madborpara community clinic (10m), Sarderpara mosque (50m), Ghatipara Market (500m), Pethan Fokirer mosque (700m).

Within the influence area of the subproject no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (checked with local IUCN representative).

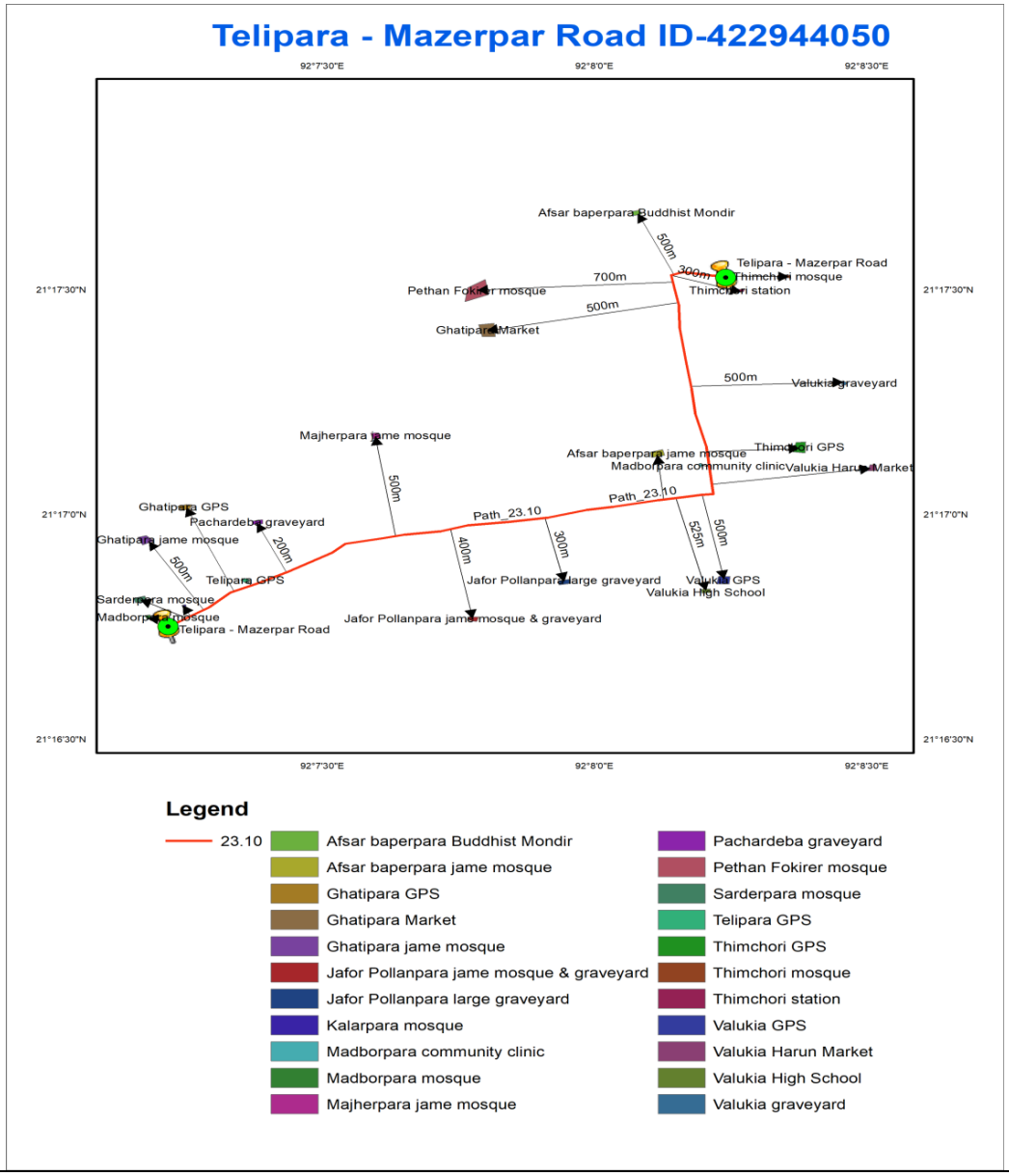
Section B: Environmental Screening

***B.1*: Environmental feature of sub-project location**

Description of cultural properties (if applicable, including distance from site):
Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests:

Sensitive environmental, cultural, archaeological, religious sites within 1 kilometer of site including at north side Telipara GPS (12m), Kalarpara mosque (50m), Pachardeba graveyard (200m), Afsar baperpara jame mosque (200m), Afsar baperpara Buddhist Mondir (500m), Majherpara jame mosque (500m), Ghatipara jame mosque (500m), Ghatipara GPS (750m), at south side Jafor Pollanpara jame mosque & graveyard (400m), Jafor Pollanpara large graveyard (300m), Valukia GPS (500m), Valukia High School (525m), at east side Thimchori GPS (300m), Thimchori mosque (350m), Valukia graveyard (500m), Valukia Harun Market (510m), Thimchori station (300m) and west side Madborpara mosque (10m), Madborpara community clinic (10m), Sarderpara mosque (50m), Ghatipara Market (500m), Pethan Fokirer mosque (700m). There are no other sensitive environmental, cultural, archaeological sites within the catchment area of this sub-project.

A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas are shown below.



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive features found in the footprint area, except matured vegetation on the sides of the road which are homestead gardens and forest. Several mosques, madrasa and local settlement were found during the survey. It will not be affected by the construction works, as the activities will be carried out within the existing subproject boundary and necessary preventive and mitigation measures will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*
No. There is no existence of Elephant corridor/ route now, which have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) potential impacts on remaining forests in/around camps Yes/No
N/A (This activity will be confined within the existing subproject boundary)

(3) Other issues: N/A

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:

Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of vehicle-related pollutants 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/ preventable by mitigation measures.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, tractor, trailer, etc. move on roads adjacent to sub-project throughout the day and night generate noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation): Landslide potential is low. There is low possibility of soil erosion or landslide during construction period of targeted sub-project. The impacts are negative but very small scale, site-specific within a relatively small area and adjustable by mitigation measures.
Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH): Groundwater is the main source of potable water in the Sub-project area. The shallow depth is about 60 feet to 70 feet and deep tube well depth is 700 to 800 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 600-800ft (Field survey, 2019). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer. Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)
Status of wildlife movement: N/A (None of the information was found about the wildlife movement in or across the area)
State of forestation: Patches of vegetation containing large and matured trees across the road side and some social forest on hill of the proposed subproject area are located within 200m radial distance.
Summary of water balance analysis (For water supply scheme only): N/A

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g. status of access road or any other facility required for sub-project to be viable): Existing roads named Madborpara connecting road, Ghatipara connecting road, Majherpara connecting road, Afsar baperpara connecting road, Thimchori connecting road and Shirdeba connecting road are concerning ancillary facilities, the access road for the sub-project is proper in order for the equipment vehicles to arrive at the proposed location. Nonetheless, heavy four wheelers will not be a suitable option, this may cause more dust in the air also, the route has narrow curves.
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction: Toilet and water supply facilities will be ensured by the contractor in the vicinity of the construction area for all the components of the sub-project, electric connection will be established with the accommodation facility due for the workforce.

Electricity is available in the area.
Possible location of labor camps: Labor camp can be established along the road since there are available open private lands for Faruk Ahmed's and Sujit Barua's private land at Telipara. However, this will have to be done with the consent of land owner under a mutual agreement, with the supervision of the Engineer in charge.
Requirement and type of raw materials (e.g. sand, stone, wood, etc.): i) Bricks ii) Sand iii) cement iv) Gravel v) water vi) Aggregates vi) steels vii) Bitumen are the most common type of road materials used in construction.
Identification of access road for transportation (Yes/No): Yes. Existing roads named Madborpara connecting road, Ghatipara connecting road, Majherpara connecting road, Afsar baperpara connecting road, Thimchori connecting road and Shirdeba connecting road are available for the access road.
Location identification for raw material storage: Adjacent to labor camp or different location is available. However, this will need placement on open fields and should be consulted with local committee. Material storage area must be well fenced and materials will be covered with tarpaulins.
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.): Earth/ mud, plastics, brick chips, cement dusts, dust from bricks, steel wires, during construction which can be identified as solid wastes. Also, sludge will be produced from labor camp latrines and kitchen waste mostly composing of organic matters as fiber, starch, carbohydrates and proteins. 10% of the kitchen waste may be classified as plastics or non-biodegradables. Solid waste may amount to 30 kg daily and sludge may amount to 5 kg per day.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g. Solids wastes, liquid wastes, etc.): **Solid waste:** Residual waste from the labor camps will be generated. Equipment maintenance/vehicles on-site and scrap material will occur during construction works which are mostly solid waste. Leftover oils or spills from machinery can be a high probability generating liquid waste. Waste from civil works. And the quantity will be tentatively 150 kg. **Liquid waste**: During construction period fecal sludge will be generated from the labor camp and the quantity would be nearly 6 kg per day, which would be reduced in weight in course of time. Leftover oils or spills from machinery can be a high probability generating liquid waste.
Type and quantity of raw materials used (wood, bricks, cement, water, etc.): **Type:** i) Bricks, ii) Sand iii) cement iv) aggregates v) water vi) concretes vii) Bitumen are the most

common type of road materials used in construction. **Quantity**: It is difficult to give exact figures of construction waste produced on a typical construction site.
Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards: No such vegetation is present in the right of way. Specific soil amount is not needed for the project. The current condition explains that there is no aggregated soil on the right of way.
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) The possibility is Medium, for stagnant water bodies to occur. Because water usage will be higher during the construction period. By default, this area has no water logging troubles due to being natural channels. Moreover, no possibilities of stagnation of water in long run. So, local communities have stated that they do not have severe troubles with mosquitos or other disease vectors.
Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No pre - existing drainage channel.
Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. Because under this intervention, there is very little scope of damage to terrestrial or aquatic ecosystems or endangered species.
Activities that can lead to landslides, slumps, slips and other mass movements in road cuts: Scope of work leading to low scale effects of landslide. The impacts are negative but short-term and site-specific. It can be managed through mitigation measures.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description) Low, since both sides of the road is more or less similar elevation. The concentrated outflow will be managed since the sub-project has included drains.
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: No

Chance of long-term or semi-permanent destruction of soils:(High/Medium/Low with description) No
Possibility of odor and water, soil quality impacts from SWM and FSM disposal system: (High/Medium/Low with description) No
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) There is no possibility of stagnant water bodies remained for encouraging mosquito breeding and other disease vectors, during the operation phase.
Likely direct and indirect impacts on economic development in the project areas by the sub-project: Construction or implementation of a road project substantially contributes to the development of the project areas. It surely improves the communication network, reduces the transport time, increases the trade and business in/around the areas, and ensures access to better living conditions with amenities, better educational and job opportunities and health facilities. Thus, the direct and indirect impacts on economic development in the project areas would be enormous by this sub-project.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No existing drainage channels or surface water bodies found in the project area, therefore, no such effect can be anticipated.
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) There are no protected areas in or around project sites, and no known areas of ecological interest.
Activities leading to landslides, slumps, slips and other mass movements in road cuts: The entire sub-project component area is nearly flat; thus, no such type of impacts is anticipated.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) No
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: Improved road communication will definitely increase the traffic/ vehicular movement, which must increase the light and noise pollution, but air pollution effect will not be increased significantly, as the proposed BC road will reduce the pollution generated from dust on the muddy road, especially during the dry season and if the vehicles are maintained in good conditions.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

Section D: Environmental Screening Summary of the Work Package-W23.10

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
1: Sub-Project Interventions	**Air quality**	Under the subproject intervention the overall score is **low**.	• Limiting earthworks; • Watering of dry exposed surfaces and stockpiles of aggregates at least twice daily, as necessary; • Requiring trucks delivering aggregates or bricks and cement to have tarpaulin cover and Limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Covering of trucks; • Records of air quality inspection;	Visual monitoring of air quality and if requires, air quality test (CO, $PM_{2.5,10}$) once in construction period in winter season.
	Soil impacts	Under the sub-project intervention the overall score is **low.**	• Precautions might be taken when rainstorms are likely, when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms. • The earthwork sites where exposed land surface is vulnerable to runoff shall be consolidated and/or covered. • The material stockpile sites shall be far away from surface water bodies and areas prone to surface run-off. Loose materials shall be bagged and covered. • Channels, earth bunds, netting, tarpaulin and or sand bag barriers	Construction Contractor monitored by Consultant and PIU	• No visible degradation to nearby drainages, • *khals* or water bodies due to soil erosion. • Rain storms in construction phase.	Monitoring as weekly basis.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
			shall be used on site to manage surface water runoff and minimize erosion. • The overall slope of the work areas and construction yards shall be kept to a minimum to reduce the erosive potential of surface water flows elsewhere.			
	Hydrology (surface and groundwater)	Under the subproject intervention the overall score is **low**.	• All precautions to store chemicals/oil/fuel properly so that no chance of spill. • Workers must specify waste dump locations to avoid littering which in turn might negatively affect surface and ground water. • Monitor water quality according to the environmental management plan.	Construction Contractor and monitored by Consultant and PIU	• Areas for stockpiles, storage of fuels and lubricants and waste materials; • Records of water quality inspection; Water Quality Test • (National Drinking Water Quality Standard Parameters)if requires; • No visible degradation to nearby drainages, *khals* or water bodies due to construction	Water quality test (mainly GW) twice during the construction period in six months interval.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
					activities. • Records should be kept and logged.	
2: Pre-construction Phase	**Sanitation, water supply**	Under the subproject intervention the overall score is **low**.	• Provide suitable housing, adequate supplies of potable water, and toilet and bathing facilities within labor camp area for the assigned laborer. • Provide means for disposing of wastewater from toilets, baths and food preparation areas either through a septic tank and soak away, or holding tank with removal by vacuum truck. • Records for any type of training or awareness building sessions must be kept at site.	Construction Contractor and monitored by Consultant and PIU	• Site-specific H&S Plan; • Records of supply of uncontaminated water; • Record of Health &Safety orientation trainings; • Condition of sanitation facilities for workers	Visual inspection by PIU and supervision consultants on monthly basis
	Transportation	Under the subproject intervention the overall score is **low.**	• Contractor should verify vehicles for the suitability of carrying, loading and unloading of materials	Construction Contractor and monitored by Consultant and PIU	• Record of regular inspection. • Record of accidents/incidents	Monthly monitoring.
	Storage of construction materials	Under the subproject intervention the	• Orienting concerned person and team assigned for the construction work.	Construction Contractor and monitored by Consultant and PIU	• List of materials and sources of materials;	During implementation phase, as necessary with discussion with

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
		overall score is **low**.				PIU, Consultant
3: Construction Phase	**Wastes**	Under the sub-project intervention the overall score is **low.**	• Prepare and implement on-site waste water runoff and labor camp waste management plan approved by PIU and consultants. • Wastes must be placed in the designated bins which must be regularly emptied. These shall remain within demarcated areas and shall be designed to prevent wastes from being blown out by wind. • All waste must be removed from the site and transported to a disposal site.	Construction Contractor and monitored by Consultant and PIU	• Complaints from community; • Regular inspection of waste management activity; • Waste disposal record.	As work weekly progresses
	Cut and fill Activities (Cutting of hill slope and earth removal from borrow areas caused for soil erosion and landslides)	Under the sub-project intervention, the overall score is low.	• During construction cut and fill will be balanced as far as is possible. Designs shall ensure that as far as possible all cut and fill activities are balanced • Proper care will be taken during cutting and filling so that slope or toe of the road embankment remain within the right of way and does not disturb the crop.	Contractor, environmental specialist of D&SC	• Location of road alignment and slope.	Daily as work progresses

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
	Storage of materials	Protected and safety storage to be needed for construction materials storage. Not interrupt natural land contours, disturbance in natural drainage patterns and logging of water and the overall score is **low.**	• With the assistance from site management committee in Camp to identify the storage site and other requirements, which will be approved by PIU and consultants.	Construction Contractor and monitored by Consultant and PIU	• List of materials and sources of materials; • Storage areas for materials and equipment.	Monthly basis during implementation phase, as necessary with discussion with PIU, Consultant
	Removal of Vegetation (May cause soil erosion and their deposition on nearby crop field, affecting soil quality and productivity)	Under the sub-project intervention, the overall score is **low.**	• If during detailed design cutting of trees is required, compensatory plantation for trees lost at a rate of 5 trees for every tree cut. • Prevent workers or any other person from removing and damaging any flora (plant/vegetation) and fauna.	Contractor, environmental specialist of D&SC	• Complaints from community;	Daily

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
	Noise pollution	Under the subproject intervention the overall score is **low.**	• Consultation with affected people; not to operate noisy equipment during working period; • No noisy work after 5.00 pm. • Sound suppression for equipment; • Ear protection for workers. • Conduct noise quality monitoring as per EMP.	Construction Contractor and monitored by Consultant and PIU	• Number of complaints from stakeholders; • Use of silencers in noise-producing equipment and sound barriers; • Noise Level following decibel meter (dB)	Inspection by PIU and supervision consultants on monthly basis;
	Air pollution	Under the subproject intervention the overall score is **low.**	• Water spraying for dust control; construction materials with potential for significant dust generation shall be covered; no smoke emitting equipment; and limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor and monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Records of air quality inspection.	Visual observation and monitoring of air quality during construction period.
	Road Safety and Accidents	Under the subproject intervention the overall score is **low.**	• Erection of suitable signage at construction sites • Direct observation and discussion with local people • Restrict the transport of oversize loads. • Operate construction vehicles to non-peak periods (night) to minimize the traffic disruption. • Enforce on-site and access road speed limits.	Construction Contractor, environmental specialist of D&Sc.	• Complaints from communities, pedestrians	Day basis during work time

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
			• The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc. • Local residents should be kept informed about planned Works			
4. Post Construction	**Road Safety**	Under the issue the overall score is **low**.	• Install traffic signs for speed limit, speed breaker where needed, Mile post and create adequate ***traffic*** detours, and sufficient ***signage*** & ***warning*** signs, Post speed limits and suitable bending on the road. • The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc.	Construction Contractor, environmental specialist of D&Sc	• Road signage and safety instruments at suitable locations and chainage	Immediately after the construction work is over.
	Tree re plantation	Under the issue the overall score is **low**.	• Replantation of trees during monsoon period • Maintain of trees properly • Check survival of trees and replant the dead trees	Construction Contractor, environmental specialist of D&Sc	• Number of complaints from stakeholders; • Records of trees number and tree plantation inspection	Immediately after the construction work is over.
5. Operatio	**Maintenance of road and**	Under the issue	• No advertisement/boardings shall be allowed within the Right of Way	LGED	• Number of complaints from	During Operation under LGED's

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
nal Phase	**assets** (Road accidents may increase due to higher number of vehicles using the roads at increased speeds)	the overall score is **low**.	limits of the project road. • Regular maintenance and cleaning of assets such as sign boards, road safety sign etc. shall be undertaken. • Clear smooth speed breaker/rough surfaces should be clear in views. • Regular maintenance of road surface and shoulders.		stakeholders	regular maintenance program in each 3 years.

* Overall Impact Score: High = Likely to cause long-term E&S impacts; Medium = Likely to cause temporary impacts; Low = Likely to cause little, short-term impacts

**Post-construction phase denotes the time period contractor use to clear and clean up the sites after the construction work is ended, perform tree plantation, grass turfing, and minor rectification till the official handing over the site to LGED, or owner of the site.

Recommendation for further environmental and social assessment and/or site specific environmental and social management plan: Yes

**If yes, please specify what assessments/plans would be required.* Mention some recommendation on E&S assessment …. ESMP

If site specific environmental and social management plan (ESMP) is followed the impacts can be mitigated and monitored. ESMP is attached.

Appendix-2: Environmental and Social Management Plan (ESMP)

ESMP for Access and evacuation Roads; *(LGED/EMCRP-W23.10): Telipara - Mazerpar Road ID-422944050*

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
Pre-Construction Stage	Loss of land / and other physical assets	• No land acquisition is allowed within this sub-project activities So, there are no any mitigation measures according to this impact.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of livelihood	• Under this subproject, there is no scope of negative impact of adjacent livelihoods	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Stakeholders Engagement	• All of the project stakeholders should be consulted • Separate community level consultation meeting with the potential affected HHs • Consultation meeting with host communities about the project objectives and scope of works	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of right to access	• Project to ensure thorough analysis of alternatives that access enjoyed by the community remains intact. • In case of unavoidable circumstances, alternative access will be provided.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Site Selection & implementing interventions: Human-elephant conflict	• Selection of sub-project sites and all implementing interventions must take place outside of the elephant corridor/influence area.	PIU	Environmental Consultant of PIU, PSC
Pre-Construction Stage	Site Preparation: Soil Erosion; Alteration of natural drainage	• Our selected sites avoided the low land near the water bodies or natural flow path to avoid the flash flood or any kind or surface runoff.	PIU & Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Tubewell location within the construction site is not near to any kinds of latrine and soaks well which could be contaminated by those. • After completing the development, we restored the place as like before to avoid the cut and fill operational problems. • This site is in the local community, so we discussed with the local community to avoid any conflicts related local habitation, culture. • Sub project intervention mustavoid of natural disturbance of existing slop and natural drainage. • The contractor ensuring sound environment for the local residents near the sub project site.		
Construction Activity	Noise from construction works	• Construction activities mostly will finish at day time within 05 PM, and must confirm proper measures for avoiding any disturbance. • All Personal Protective Equipments (PPEs) must be ensured in sites before starting any kinds of construction works.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Dust	• Acceptable range of emission of CO, particulate matter [SPM (**Suspended particulate matter)**, PM2.5, 10] and Hydrocarbons must be maintained through good construction work practices • Dust generation must be limited as a result of clearing, leveling and site grading operations with using water florescent manually and through water	Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		pipes. • Dust generation due to vehicle movement on connecting road shall be controlled by watering the path at limited level		
Construction Activity	Safety Issues	• Unauthorized entry is completely prohibited in our site and take necessary measures for preventing this problem • Before works started Contractor must provide proper training and guidelines on health and safety issues to the labors and associated staffs. • Records of every training must be kept at site. • All kinds of Child labour are completely prohibited in every site. • Every construction materials storage site will be well fenced by Tin and safety caution tape.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Traffic Management	• Contractors will maintain proper route for traffic management which is to beconsulted with and confirmed by the Executive Engineer of Cox's Bazar.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Conflicts with existing users due to the scarcity of resource base.	• A detailed assessment of the available resources and consent of the local representative for withdrawal of water from existing surface water sources shall be taken. • If ground water is withdrawn, adequate approvals from the appropriate department need to be undertaken before setting up bore wells. • Any type of consent letter or agreement for	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		withdrawing water from either surface or underground sources will be kept on site. • Local community must be consulted before any construction works starts.		
Construction Activity	Increase in road accidents	• Maintain safety measures during the movement of heavy machinery and equipment. • Local community will be trained up on traffic management and awareness.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Labour Base Camp: Conflicts with the local residents	• Awareness building session will be undertaken about prevention of child abuse, child marriage, GBV, sexual harassment, trafficking of women and children as well as illegal drug trade. Written records of this awareness building session shall be kept on site. • Work force should be prohibited from disturbing the flora, fauna including hunting of animals, wildlife hunting, poaching and tree felling. • Adequate facilities ensuring sanitation for labour camps will be put in place • Treated water will be made available at site for drinking purpose. • Adequate accommodation arrangements for labour forces. • Labor code of conduct is to be disclosed through consultation.	Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Construction Activity	Waste Management: Improper management and handling of	Preparation of a waste management plan covering the following aspects:	Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
	hazardous and non-hazardous waste during construction.	• Residual waste from the temporary accommodation facilities for labor Waste and from equipment maintenance/vehicles on-site • After completion of construction works. So, recycling process is not applicable. • Proper consents for hazardous waste management.		
Construction Activity	Health & Safety Risks: • The potential for exposure to safety events such as tripping, working at height activities, fire from hot works, smoking, failure in electrical installation, mobile plant and vehicles, and electrical shocks. • Exposure to health events during construction activities such as manual handling and musculoskeletal disorders, hand-arm vibration, temporary or permanent hearing loss, heat stress, and dermatitis.	• All construction equipment will be properly inspected timely. • The risk assessment will be prepared and communicated prior to the commencement of work for all types of work activities on site. • Preparation of proper walkways and clearly designation as a walkway has to be ensured; all walkways shall be provided with good conditions underfoot; signposted and with adequate lighting. • Proper Signpost at any slippery areas will be ensured in construction site. • Fire extinguishers will be located at identified fire points around the site. The extinguishers must be appropriate to the nature of the potential fire. • This sub project has Proper communicative emergency response plan (ERP) with all parties, the ERP to consider such things as specific foreseeable emergency situations, organizational roles and authorities' responsibilities and expertise, emergency response and evacuation procedure and personnel will	PIU & Contractor	Environmental Consultant as well as Social Development and Gender Specialists of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		be trained and drilled to test and ensure the coherence with the plan. • All people of construction site will be concerned about the safety and maintenance of Electrical equipment; works will be carried out on live systems. • Provision to first aid box in sub-project areas will be ensured. • Proper Emergency evacuation response plan will exist in sub-project area. • All safety equipment will be available in sub-project site (safety, size, power, efficiency, ergonomics, cost, user acceptability etc.), the lowest vibration tools will be provided that are suitable and can do the works. • Awareness training will be given to all personnel involved during the construction phase in order to highlight the heat related illnesses of working in hot conditions such as heat cramps, heat exhaustion, heat stroke, and dehydration. Written records of this awareness training shall be kept on site. • Adequate quantities of drinking water will be available at all Sites, on different locations within the site. • Provision to maintain proper PPE wherever necessary and to ensure that there are satisfactory washing and changing facilities. • Provision to ensure all workers exposed to a risk are aware of the possible dangers and also given thorough		

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		training on how to protect themselves and there should be effective supervision to ensure that the correct methods are being used.		
Operation &Maintenance	Noise disturbances to fauna	• Provision to maintain noise and vibration from the operation and maintenance of machinery and equipment by proper monitoring and measures. • Provision to take necessary lighting, caution for the works and necessary maintenance should be done in day light.	PIU	Environmental Consultant of PIU, PSC. Union Member
Construction activity	Odours and pollution caused by leaking latrines and faecal sludge, and solid wastes impacting surrounding water bodies, flora and fauna	• Preventative maintenance schedule should be followed. • Solid organic wastes should be stored in bins and/ or skips and emptied regularly at a designated waste disposal area away from the camp site. If no designated site is available within the reach, a dug-hole at a nearby place can be used with periodic filling with soil layer for preventing pollution and generating nutrient rich compost soil over time.	PIU	Environmental Consultant of PIU, PSC. Union Member
Decommissioning during the project implementation period (including site clearance after the construction)	The impacts are similar to those listed in construction stage: • Pollution from waste materials • Health & Safety risks to workers and local community	• Contractor must prepare a demolition and waste management plan including following directive aspects given hereunder.	PIU / Contractor	Environmental Consultant of PIU, and Executive Engineer of Cox's Bazar

Waste Management Plan:

The Contractor shall develop a waste management plan for various specific waste streams (e.g., reusable waste, flammable waste, construction debris, food and organic waste etc.) prior to commencing of construction and submit to LGED for approval. The plans must include following principles or series of actions, which will be carried out/followed by the contractor and supervised by the Field level Environmental Specialist and Social Development Specialist.

For wastes:

- The quantity of waste materials shall be minimized by 3R (Reduce, Recycle and Reuse) approach, and wastes shall be segregated accordingly, wherever practical; and stored in designated places/facilities in the site.
- Construction site shall be maintained in a cleaner, tidy and safe condition and appropriate facilities shall be provided and maintained as temporary storage of all wastes before transportation and final disposal.
- Hazardous waste viz. waste oil etc. will be collected and stored in a paved and bounded area and subsequently sold to authorized recyclers.
- The scrap material generated from related construction activities will be collected and stored separately in the stack yard and sold to local recyclers.
- All wastes generated during construction shall be disposed off in an environmentally acceptable manner. This will include consideration of the nature and location of disposal site, so as to cause less environmental impact.
- Other leftover non-hazardous wastes, including construction debris shall be transported to an approved disposal site by pick up tracks or back loaded vehicles with proper care.
- Organic wastes produced in the camp site during the construction period shall be collected and transported in vehicles covered with tarps or nets to prevent spilling waste along the route to the designated disposal site;
- Burning of any type of wastes in the construction site shall be prohibited completely.

Prepared by: Harogopal Kabiraj, Environmental Focal Person, +8801714980171

Tanvir Ahsan Haque, Environmental Specialist, +8801688117059

Ms. Sadia Azad, Disaster and Climate Change Specialist, PIU.

Reviewed by: Md. Saiful Islam, Field Level Environmental Specialist, +8801913442006

Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.10

In consideration to the above-mentioned environmental impacts and their mitigation measures for all sub-projects, individual BOQ for each component has been prepared. Following tables will illustrate such items of enhancement and impact mitigation works as well as considering the emerged situation of COVID-19, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites.

Cost of Environmental Enhancement Works for W23-10 in BOQ

Sl no.	Description of item	Quantity	Unit price	Total amount (BDT)
1.	**Grass Turfing** Turfing on embankment top and slope & any critical place with good quality turf supplied by the contractor of not less than 225mm square in dimension including placing and watering till grass is fully grown, etc. all complete as per direction of E.I.C. (Payment to be made only when grass is fully grown)	6,921.70 Sq.m	@38.15 Tk. Per sqm	264,062.86
2.	**Dust suppression measures** Dust suppression measures like water sprinkling on aggregates/unpaved roads, in and around the work site and as per direction of E-I-C	2320.0m	@ 2.56 BDT	5,939.20
3.	**Water Supply and Sanitation** Providing and maintaining adequate portable water supply, sanitation, cleanliness facilities at camp site and work site to the entire satisfaction of Engineer-in-charge. **Temporary Toilet:** Construction of temporary toilets in work site/ rest area complete as per design and specifications and approved by the Engineer-in-Charge. There should be 1 camp in each site. In each camp, there should be 1 no of toilet for women and 1 no of toilet for men.	2 nos.	@12822.86 per toilet	25,645.72

Sl no.	Description of item	Quantity	Unit price	Total amount (BDT)
4.	**First Aid Box** Supplying, equipping and maintaining adequate first-aid box throughout the working period at worksite and site office, and erect conspicuous notice boards directing where these are situated and providing all requisite emergency medical first aid kits, including complying with the government medical or labour requirements at all times, and provide, equip and maintain necessary dressing kits throughout the working period for attending minor injuries, etc. all complete as per requirement and full satisfaction of Engineer-in-charge.	1 no.	LS @5000 Tk. Per box	5,000
5.	**Drinking Water Facilities** Providing continuous adequate drinking water supply at worksite and site office as well by installing necessary tube-well/s where applicable or any other means depending on local situation, also providing essential arrangement for storing drinking water by supplying portable best quality water tank equivalent to Gazi/Padma of adequate capacity depending on the number of users, including supplying 1 (one) no. best quality water filter of minimum capacity 30 liters with necessary kits, etc. all complete as per satisfaction and direction of the Engineer-in-charge.	2 nos.	LS @ Tk. 30,000	60,000
6.	**Traffic Management** Maintaining traffic management at worksite from time of commencement of contractor's activities to time of completion activities, including ensuring that the road is safe for users, providing a safe working area for those involved in work on trafficked network and minimizing any disruption to smooth flow of traffic (this includes providing ne	1 no.	LS @ Tk. 15,000	15,000

Sl no.	Description of item	Quantity	Unit price	Total amount (BDT)
7.	**Personal Protection Equipment for Workers** Providing and maintaining appropriate (safe design, fit and comfort) personal protection equipment (PPE) to ensure the highest possible protection for employees in establishing and maintaining a safe and healthful working environment at workplace, including demonstrating, providing training on proper understanding and development of skill in the use of PPE, including supplying (i) best quality safety jacket, (ii) suitable hand protection gloves, (iii) appropriate foot protection shoes, (iv) best quality safety helmets, face shields, ear muffs etc. (v) suitable eye protection goggles	LS	LS @ Tk 30,000	30,000
8.	**Tree plantation** Tree plantation to compensate the felled down trees and enhance the ecological condition in the subproject area- preferably local fruits, flowers, medicinal and ornamental trees- Mango, Jackfruit, Jam, Kathbadam, Chalta, Krisnachura, Bokul, Jarul, Polash, Kadom, Shimul, Neem, Arjun, Amloki, Horitoki, Bohera, Mahogany, Palm Tree, Chambal, Rain Tree, Shil koroi, Satim, Sishu (including protection, fencing and conservation during project defect liability period): Preferably at both sides of Road where space is available (fencing as per LGED rate schedule 5.26.14) (Contractors will also be instructed by the consultant and PIU prior to the tree plantation work) at an interval of 10 feet.	200 nos.	@ Tk. 1000	200,000
9.	**Motivation training** Motivation training (twice: before and after construction start) of the Upazila Engineer 'sand Contractor's representatives on safety practice and as per direction of the E.I.C.	1 no.	LS @ Tk. 10,000	10,000
10.	**Waste disposal facility**	LS	@ Tk. 5000	5,000

Sl no.	Description of item	Quantity	Unit price	Total amount (BDT)
	Temporary camp site waste disposal facility improvement 2 nos. (1 no of organic waste and 1 no of inorganic waste disposal facility) and as per direction of E.I.C.			
11.	**Water Test (Drinking Water samples)** Water samples are to be collected periodically (half yearly) from the tube well at labor shed area for laboratory analysis of different parameters such as pH, arsenic, iron, chloride, hardness, total dissolved solids, nitrate, nitrite, coliform, electrical conductivity etc. all complete as per direction of E.I.C. (including the cost of actual fees for testing from reputed laboratory and report) as desired by E.I.C.	LS	@ Tk. 5000	5,000
12.	**Working labour shed:** Construction of Labor shed (Size: 30'x20') with C.I sheet Roofing, Tarza fencing and brick soling floor as per requirement and direction of the E-I-C.	1 no.	LS @ Tk. 30,000	30,000
13.	**Environmental management** Environmental management costs of the Environment & Social/ Safeguard Personnel for Environmental and Social Management and Monitoring during construction and operation phase for their salary & transport (Net payment excluding Tax &VAT). And as per direction of the E.I.C. **(One Safeguard Personnel for R1, R2, R4, R10, & R13)**	1 person	Monthly basis @Tk. 35,000.00 for 12 months. One person covering 5 roads i.e.35,000Tk.*12 months*(1/5 one road).	84,000.00
	Subtotal Bill: Environmental facilities			**739,647.78**

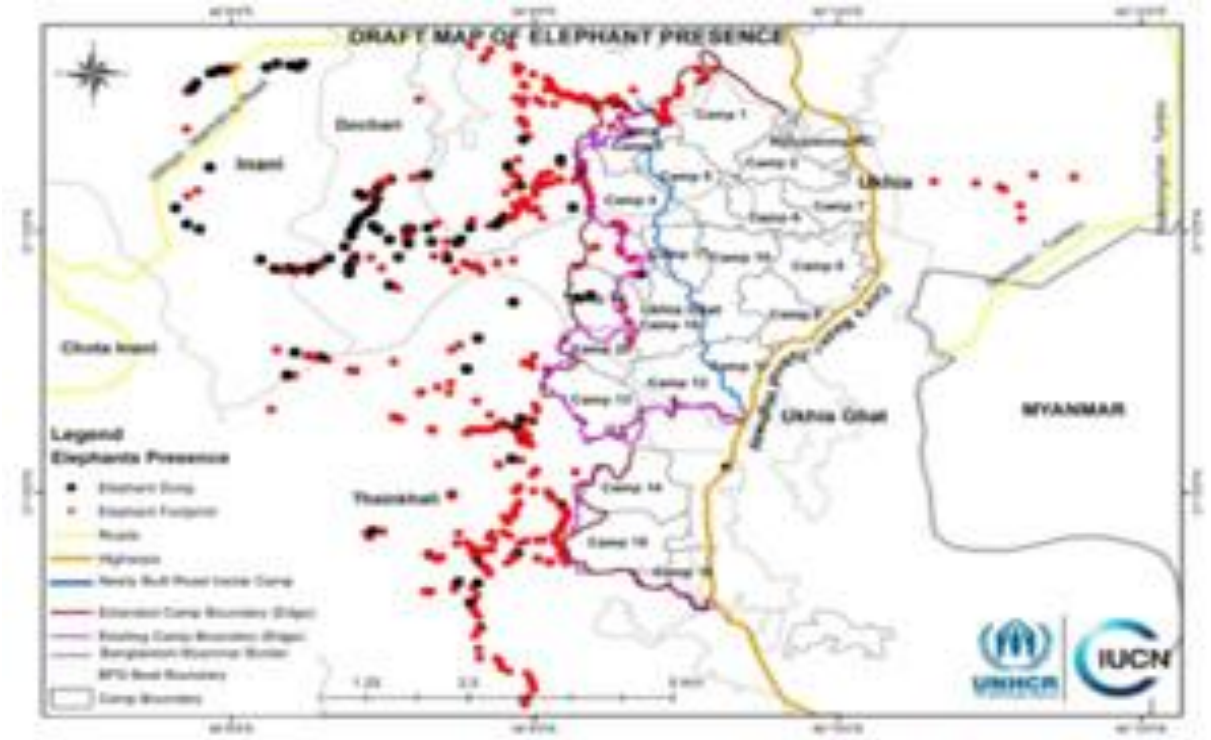
Cost of H&S Measures under COVID 19 Situations for W23-10

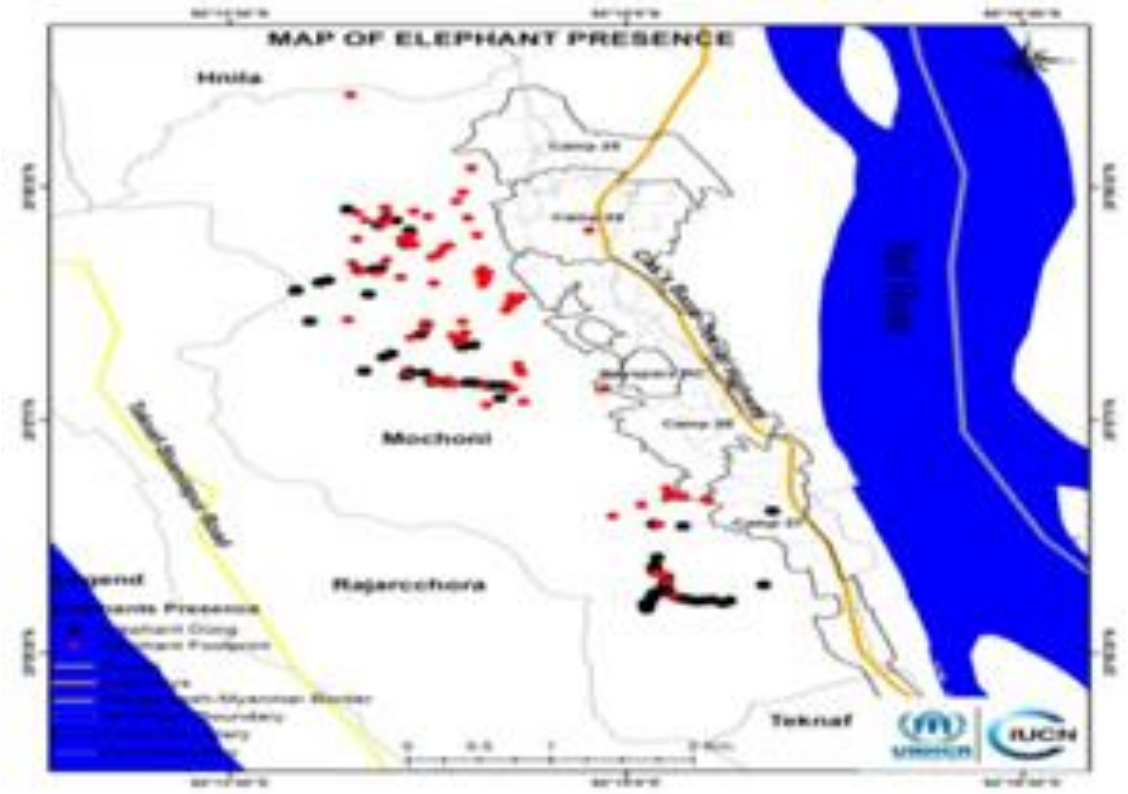
Considering the emerged situation, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites. The cost is estimated counting 46 workers for 270 active working days (9 months in a year) in a contract period for one site under this package (EMCRP/W-23.10).

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
1.	Non-Contact IR Digital Thermometer	01 nos. in each site	N/A	N/A	5,000.00	1	5,000.00	Each site office will have a thermometer for checking body temperature every morning at the entrance of the working site
2.	Wash Basin with Small Water Tank, Bucket and Mug (or piped water supply)	01 nos. in each site	N/A	01 nos. in each camp	10,000.00	2	20,000.00	Wash basin to be installed at favorable locations immediately after the entrance to the facility
3.	Trash bin (covered)/Paddle Bin	01 nos. in each site	N/A	01 nos. in each camp	550.00	2	1,100.00	
4.	Bar Soaps (150 gm each)	124		155	50.00	279	13,950.00	To be placed in a case/holder on the basin, for washing hands for max. 51 people a day and showering of 46 workers in each labor camp.
5.	Hand Sanitizer (2 nos. 250 ml bottle and 5 liter Can for Refill)	2 bottles and 1 Can for each site	N/A	N/A	4,000.00	1	4,000.00	2 bottles and a 5 litre can for each Site office
6.	Face Shield/ Protective Safety Goggles	30 nos. for each site		N/A	400.00	30	12,000.00	For labors who work in close contact, 30 in each site

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
7.	One time Mask (Disposable) for Contractors' Staffs	5 nos. each day in each site		N/A	12.00	1350	16,200.00	Reusing N95/KN95 mask will not be a manageable option in field scenario, one time disposable medical/surgery mask a good option instead.
8.	Cloth mask for Workers	N/A	46 nos. for each labor camp		35.00	828	28,980.00	A worker will use a mask for 15 days with everyday washing
9.	Floor Cleaner (1 litre Can)	1.5 Can	N/A	5 Can	250.00	6.5	1,625.00	
10.	Detergent Cleaner	N/A	2 kg in each camp/month		400.00	18	7,200.00	To be used for washing clothes, masks and tools & equipment, etc.
11.	Miscellaneous cost				20,000.00	1	20,000.00	Contingency cost for medical emergency and compensation for workers, subject to proper documentation
	Grand Total						**130,055.00**	

Appendix-4: Elephant Migration Routes Map





Elephant presence map (latest information published by on 24 May 2018)

Appendix-5: Location Map of Sub-project component

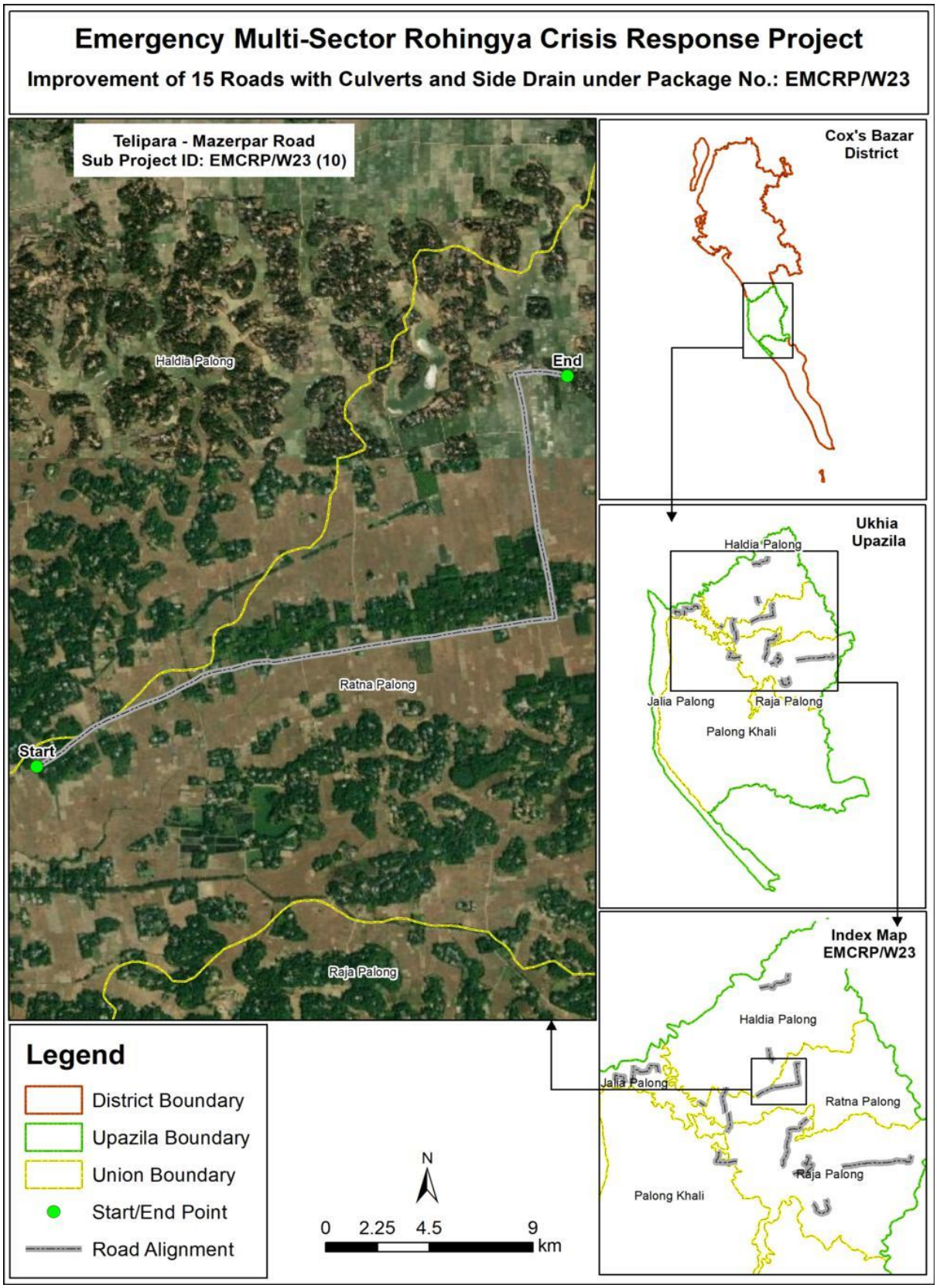
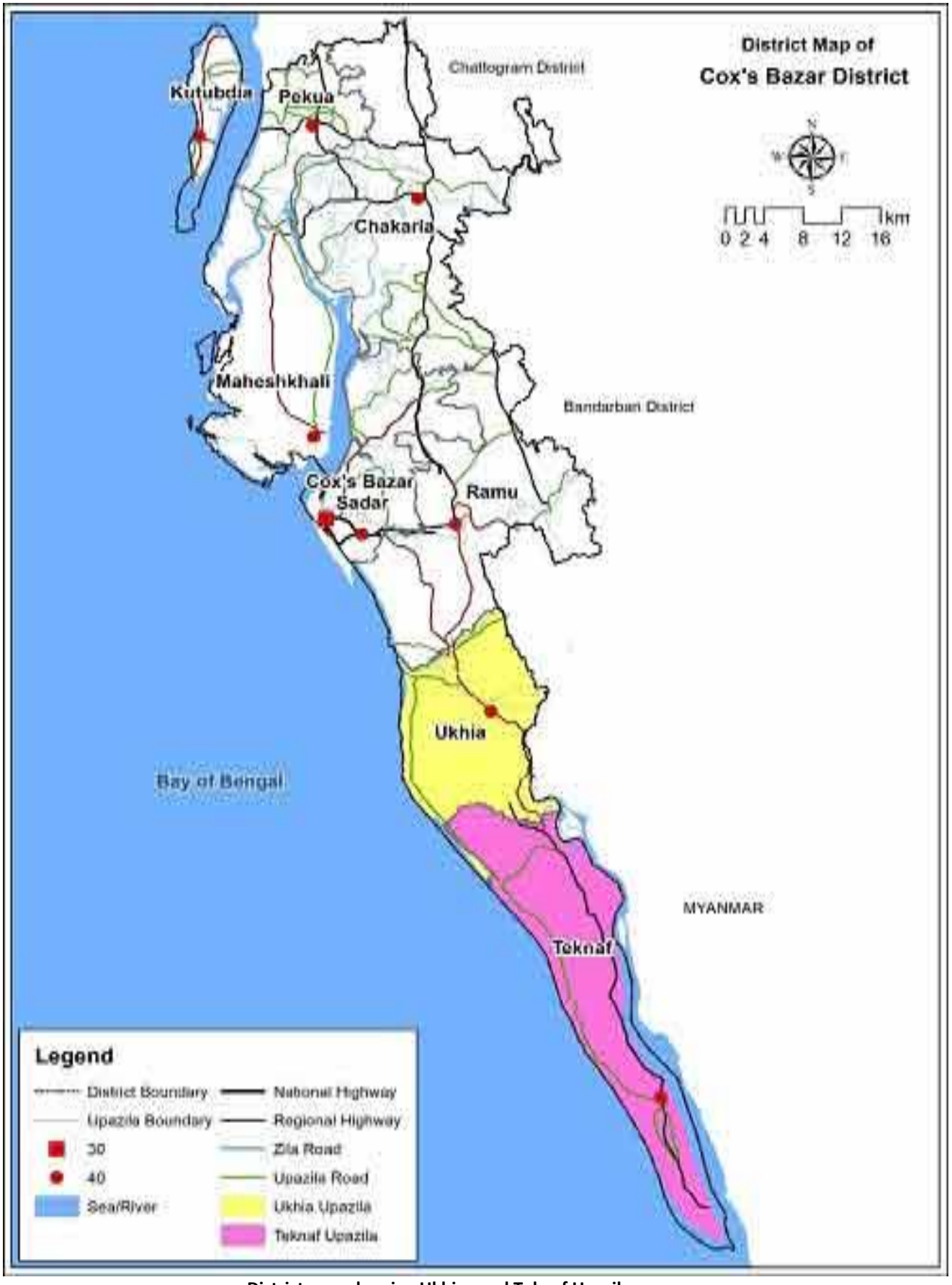
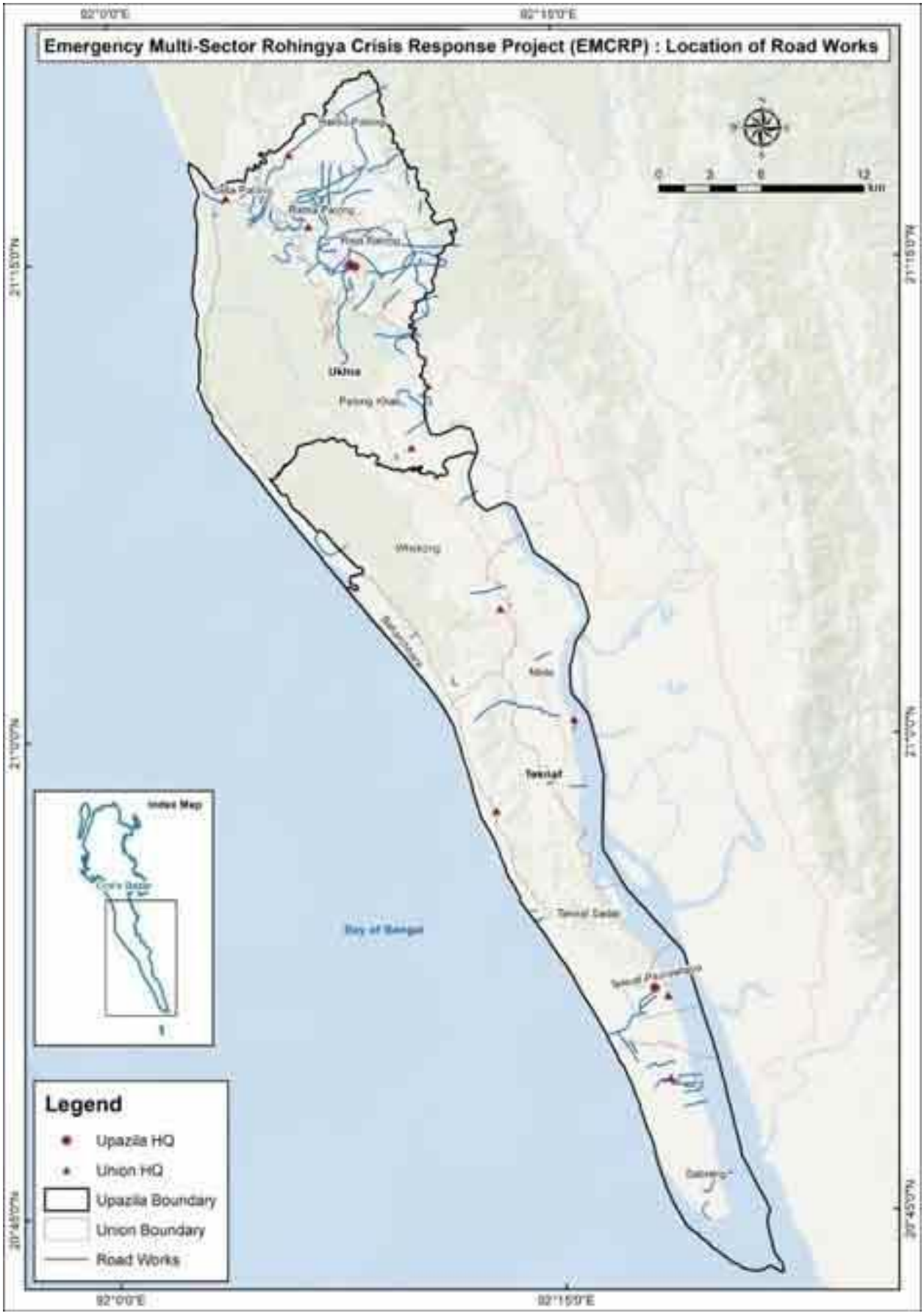


Figure: Location Map of W23-10



District map showing Ukhiya and Teknaf Upazila



Upazila map locating proposed roads

GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH
Ministry of Local Government, Rural Development and Co-operatives
Local Government Division
Local Government Engineering Department

Emergency Multi Sector Rohingya Crisis Response Project (EMCRP)

Project ID: P167762 **IDA Credit No. 5561-BD**





Environmental Screening Report

For Ukhia hatimora Road from ID-422944058 with culverts and side drain under Cox's Bazar District.

Under the package no. EMCRP/W23

Funded by:

THE WORLD BANK
IBRD • IDA

Government of the People's Republic of Bangladesh & World Bank

Design and Supervision Consultancy:

Development Design Consultants Ltd.

October-2020

Contents

1. INTRODUCTION 1

1.1 Project background 1

1.2 Elementary information of Work Package Component of W23.9 2

1.3 Proposed intervention items for this component 4

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS 4

2.1 Methodology 4

2.2 Important features/establishments within the PIA 5

2.3 Issues and Recommendations raised by the Participants in regards to component interventions for W23.9 6

3. ENVIRONMENTAL SCREENING 7

3.1 General 7

3.2 Major Findings 8

3.3 Climate Change Impact Screening 10

3.3.1 General Overview of the area 10

3.3.2 Site Specific Screening and outcome 11

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) 12

4.1 General 12

4.2 Health and Safety Measure under COVID Situation 14

4.3 Cost of Environmental Enhancement Works in BOQ 15

5. LIMITATION OF THIS STUDY 15

6. CONCLUSION AND RECOMMENDATIONS 16

Annexure-01: Important Environmental Features (IEFs) near site 17

Annexure-02: Attendance of consultation meetings for W23/9 19

Annexure-03: Pictures of sub-project component location and surrounding features with public consultation 21

Appendix-1: Environmental Screening Form for examining sub-project component 22

Appendix-2: Environmental and Social Management Plan (ESMP) 40

Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.9 48

Appendix-4: Elephant Migration Routes Map 53

Appendix-5: Location Map of Sub-project component 54

ACRONYMS

BOQ	Bill of Quantities
BFS	Brick Flat Soiling
D&SC	Design and Supervision Consultant
DoE	Department of Environment
DRP	Displaced Rohingya people
EA	Environmental Assessment
EC	Electrical Conductivity
EMCRP	Emergency Multi-Sector Rohingya Crisis Response Project
ESMP	Environmental and Social Management Plan
ERP	Emergency Response Plan
ESMF	Environmental and Social Management Framework
FDMN	Forcibly Displaced Myanmar National
FGD	Focus Group Discussion
FSM	Faecal Sludge Management
GBV	Gender Based violence
GPS	Government Primary School
GRM	Grievance Redress Mechanism
HBB	Herring Bone Bond
IEFs	Important Environmental Features
ISCG	Inter Sector Coordination Group
IUCN	International Union for Conservation of Nature
IWM	Institute of Water Modeling
LGED	Local Government Engineering Department
PIA	Project Influence Area
PIU	Project Implementation Unit
PMU	Project Management Unit
PPE	Personal Protective Equipment
PSC	Project Steering Committee
SMC	School Management Committee
SPM	Suspended Particulate Matter
SWM	Solid Waste Management
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
UNHCR	The United Nations High Commissioner for Refugees
VAT	Value-Added Tax
WB	World Band

1. INTRODUCTION

1.1 Project background

An estimated 730,000[1] people of Rohingya community has fled to neighboring Cox's Bazar district of Bangladesh since August 25, 2017 to escape extreme violence in Rakhine State of Myanmar, which caused the total number of Forcibly Displaced Myanmar National (FDMN) in the district to be about 923,033[2]. This huge number of displaced population account for about one-third of the total population of Cox's bazar, a district which was already facing many development challenges and suffering from resource-constrained social service delivery system even before the crisis evolved and the mass exodus of FDMN has worsened the situation further. Almost all of these displaced people are hosted in Ukhiya and Teknaf Upazila of Cox's Bazar, in extremely congested settlements in areas having very minimal access to basic infrastructure and services and is prone to natural disasters. The Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP) has been designed in order to reduce the vulnerability of Forcibly Displaced Myanmar National (FDMN) along with people from the host communities in Teknaf and Ukhiya Upazila under Cox's Bazar District, to different disasters and improve the social service delivery system and disaster resilience to both the communities. This project will follow a sustainable development pathway that is resilient to disaster and climate change effects.

The objective of the Project is to provide greater protection for the FDMN and host communities through:

- Reducing the vulnerability to natural disasters
- Improving social service delivery system and providing better communication facility through physical interventions
- Improving water and sanitation facilities
- Reducing vulnerability to accidental fire
- Provisioning better educational facilities and
- Strengthening and scaling up of GBV prevention services to the FDMN

The project is jointly being implemented by Local Government Engineering Department (LGED), Department of Public Health Engineering (DPHE) and Ministry of Disaster Management and Relief (MoDMR) under their respective mandate and scope of works. Apart from the interventions in Addressing Gender and Social Inclusiveness and Preventing Gender Based Violence with the Support from UNFPA and building Communication and Awareness among all affected parties through an effective engagement of BCCP (Bangladesh Center for Communication Programs) in the areas, LGED is implementing a good number of infrastructural facilities, namely improvement of hat bazars, roads (both inside and outside of the camps), bridges, culverts, construction of School cum multi-purpose disaster shelters, Satellite Fire Stations, Relief Distribution Center, Community Service Center and many other different types of facilities. Given the project interventions, sensitivity of the areas and volume of people in or around the sites, the project is more likely to trigger certain Operational Policies and Bank Procedures, namely Environmental Assessment (OP/BP 4.01), Natural Habitat (OP/BP 4.04), Forest (OP/BP 4.36) and Physical Cultural Resources (OP /BP 4.11).

[1] ISCG: Situation Report Rohingya Refugee Crisis, (September 27, 2018)

[2] IOM Needs and Population Monitoring round 12 as of October 10, 2018

1.2 Elementary information of Work Package Component of W23.11

It is imperative to recognize proposed components under Work Package-23.11 in Ukhiya Upazila in order to assess and verify its interventions according to stipulated screening requisites from WB. Acknowledging this matter, such details are accounted for as given below in Table 1.2.1 along with visual presentation (General Upazila Map) given in Figure 1.2.1. Aerial map for this component is given in Appendix -5.

Table 0-1.2.1: Basic Featured Information of components [Sources of data: Field survey, 2020: DDC & LGED]

Component's name under W-23	GPS Coordinates	Distance from Upazila HQ	Union	Ward	Project Influence areas locations	Pre-existing condition of Road	Proposed Road type	Road dimension(m) (Length X Width) = Footprint (sq.m) *
Ukhia hatimora Road from ID-422944058	**Starting Point** 21.25072^0 N 92.15372^0 E **Ending Point** 21.25546^0 N 92.18069^0 E	01km	Rajapalong	8 & 7	West Dorgabil, Taipalong, Naikhunchori, Shailerdeba, Lambaguna, Kutupalong	Partly Broken HBB and partly Earthen	Bituminous Carpeting (BC)	(2546mX 4.9m) = 12475.4 sq. m

*Note: Roads are proposed to have average carriage way of 3.7m with 0.6m shoulder on each side; special conditions may prompt further adjustments while in construction period. However, footprint for roads is calculated with an average of 4.9 meters.

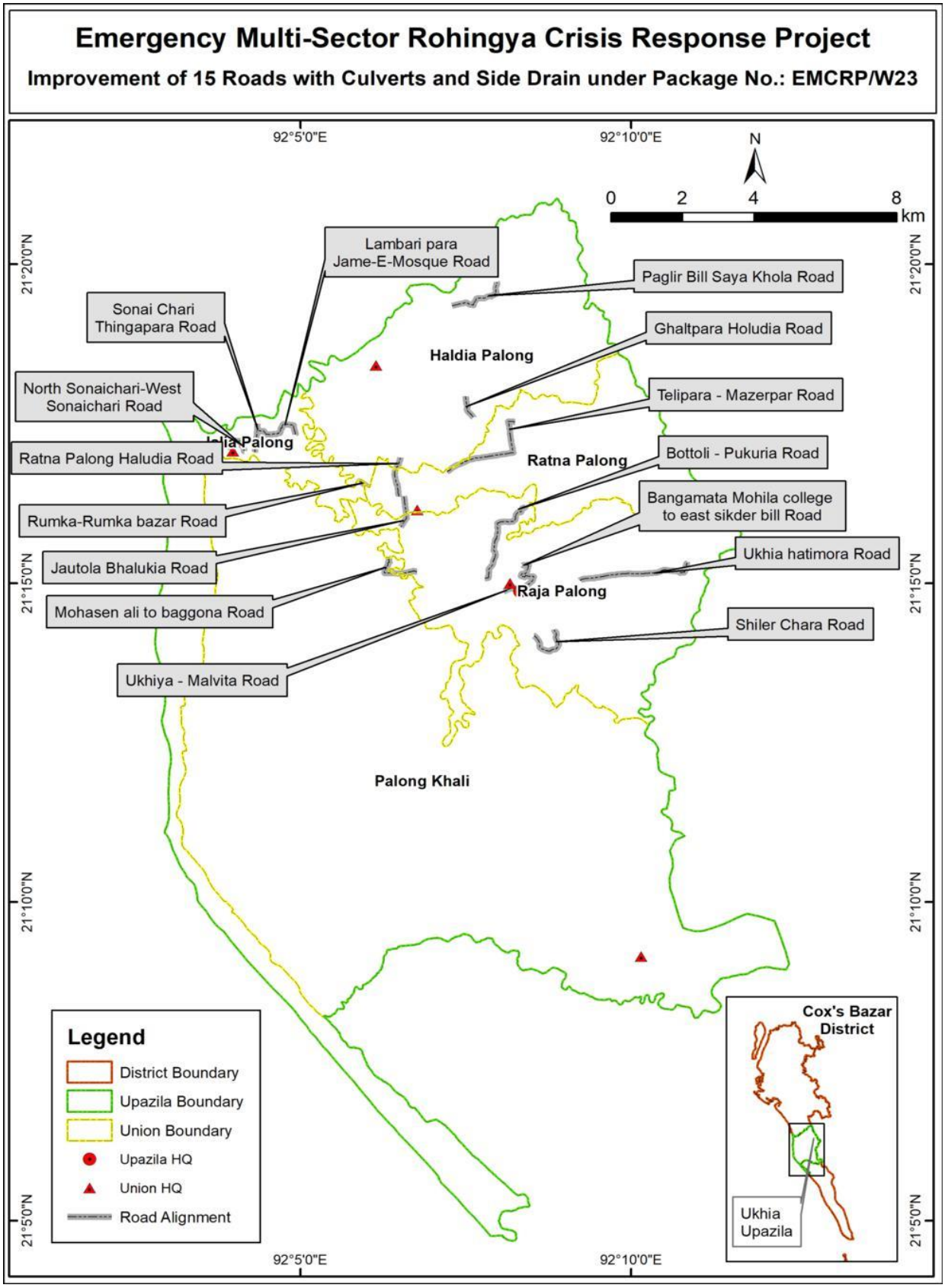


Figure 1.2.1: Map illustrating Ukhia hatimora Road from ID-422944058 location in the Ukhiya Upazila

1.3 Proposed intervention items for this component

The Ukhia hatimora Road from ID-422944058 (W23/11) under work package W23 have been proposed with specific need basis dimensions to accommodate and ensure best quality interventions for local stakeholders. In context of governing environmental circumstances and geo-meteorological conditions, protection work items have been added to construction design for safety and sustainability of each proposed roads. These roads are abutting agriculture hence, construction and improvement works will descent these roads into new circumstances in some parts. These items have been included on the basis of field survey and analysis of these conditions. Please follow the table to acknowledge these items.

Table 1.3.1: Proposed safety interventions of component

W23-11: Ukhia hatimora Road from ID-422944058
03 nos. Cross Drain (dimension: 0.975mX 0.975m) at Ch. 2912.0m, 3746m, 4970m and **04 nos. Cross Drain** (dimension: 0.750mX 0.750m) at Ch. 4389m, Ch. 4483m, Ch.4594m, Ch. 4875m and **02 nos. RCC Box Culverts** (dimension: 2.0mX2.0m) , **01 nos. 2 vent Box Culverts** (dimension: 3.5mX3.5m), **137.0m L-Drain** at different chainage, and **17.0m Toe wall**(105X2.0X2.5)**,** and **RCC Retaining wall** (19m X 3.0m) from ch:4377m to 4396m**. Road safety** work and **Environmental Mitigation and Enhancement** works are also included. Description of safety works and environmental enhancement works can be found in BOQ attached in Appendix-03.

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS

2.1 Methodology

Public participation and community consultation have been taken up as an integral part of environmental assessment process of the project. As part of the impact assessment, participatory public consultation was conducted in areas of concern for proposed roads by the field level staffs and consultants from PIU and D&SC. The consultation meeting was attended by disparate social groups representing local habitants, separate age groups, social class and occupations. In some cases, IUCN employees in charge of elephant watch tower were present where frequent elephant movements occur. The participants were also selected from different segments of stakeholders, and some of whom will have major active roles before, during and even after the construction works. Therefore, the meeting was organized in an informed, expressive and unbiased manner, wherefrom different views and concerns came across which will be properly taken care of during the design and construction phases. In order to serve our screening process, relevant items were thrown towards the audience to discuss and troubleshoot confusing or worrying matters regarding the proposed intervention under package work. Impacts in regards to environment, socio-economic matters during pre-construction, construction and post construction phase have been put forth. Possible mitigation measures and relevant needs have turned out during these sessions as well. Moreover, their comprehension as a stakeholder has been up lifted in light of project guidelines.

However, public consultation is a living process as the types of problems/ difficulties, involved parties or stakeholders and mode of settlement or resolution processes are more likely to differ with time. Thus, consultation with different parties or stakeholders will be continued throughout the sub-project implementation period and records of resolutions, whatsoever and wherever possible, will be kept in writing at the site and made available on any enquiries or requests by all parties concerned.

Most of the possible impacts under this component development have been put through review for locating impediments or possible adversity effecting future environment and socio-economic conditions. In order to comprehend surrounding features and impacts which may stipulate with it, screening has acknowledged having a Project Influence Area (PIA) of 0.5-kilometer radius. Sensitive findings have been identified if any, and relevant mitigation or minimization measures were suggested to subdue such complication for over the project construciton period. Moreover, evaluation was inspired to enhance environmental features and include monitoring initiatives under ESMP budget to ensure exertion of environmental improvement propositions. Contractor's responsibility has been taken into account while identifying possible impacts through sets of intervention accounts. These steps have been initiated strictly following ESMF guidelines and requirements. Environmental screening procedure was motivated by ingredients highlighted in Appendix-2 of ESMF. During survey, detail chainage length of the sub-projects was taken into account for detailing environmental and socio-cultural features within 100 meters buffer zone of both Left and Right side from the center line of the road. Longitudinal intervals of 300 meters have helped to identify positions of sensitive or near-sensitive socio-cutural features. These findings are illustrated in **Annexure-01**.

2.2 Important features/establishments within the PIA

Initial screening process is conducted through direct involvement of PIU and D&SC in the influence area of the proposed component, which allows to raise significant questions and ideas towards participants. In combination of both field walk-through and inputs of audience, a register of existing features is formed. Allow the following table to describe such elements in all the work package components.

Table 2.2.1: Important features within Project Influence Area for W23.11

Component's name under W-23	Direction	Important features/ establishment (approx. distance from the proposed site)
Ukhia hatimora Road ID-422944058	North	Dorgaplaong GPS (500m),
	South	Ukhiya Degree College (1km), Shailer Dek Mandir(800m), West Daroga Etimkhana/mosque(10m), Patabari Mondir(1km), Patabati GPS(1km SW), west dorgabeel graveyard (500m)
	East	Dorgahabeel GPS (500m), Dokaner Mora Jame Mosque (50m), Dorga/Bazar(1km),
	West	Taipalong Madrassa(500m), Taipalong Graveyard (500m)

2.3 Issues and Recommendations raised by the Participants in regards to component interventions for W23.11

After inauguration has set in motion, their valuable opinions and remarks came pouring out. At this point, we find our field base knowledge for assessment attributed impact degrees and possibilities. Please follow the table 2.3.1 given below to recognize participants' inputs arranged in relevance with this component. Consultation meeting summary, attendance sheets and pictures of separate meetings with proposed location for this subproject component can be found in Table 2.3.2 and Annexure-02 and Annexure-03 respectively.

Table 2.3.1: Issues and Recommendations raised by the Participants

COMPONENT'S NAME UNDER W-23.11	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
UKHIA HATIMORA ROAD FROM ID-422944058	•In West Dorgabeel, Taipalong, Naikhunchori, Shailerdeba, Lambaguna, Kutupalong area, this proposed road is previously HBB developed and half of the proposed area is earthen road. They feel this improvement with BC is highly needed for them to ensure quality road for better communication facility. This road will end up Hatimora area. A distributary stream of Rejur khal is present in between 1500m to 1800m. Here construction work will need extra precaution. Currently, no vehicle can pass due to absence of a bridge. Here, an ADB proposed bridge is under way for the amelioration. It was informed by the local member of this Rajapalong union. • Big vehicles cannot use this road due to having short crest. In some parts of the road there is no condition for any sort of vehicles to pass. This condition is found among last quarter of the road chainage. •Possible dust and noise pollution during the construction works. •Safety of children and adults at the sites during construction works. •Elephant movement not present. •Local community wish to have a better drainage system along with the road in order to allow waters from higher grounds to find an uninterrupted pathway not causing	• Local people considered that the selected site is suitable for the construction of this road from both the technical and social-environmental (Direct savings in the cost of operating vehicles, time savings by travelers and freight, wider effects can less accident rates, this road is waterproof and also dust free, much more durable) point of view. It will provide better mobility and access to services in due time. •The road should consider water flow during rainy seasons thereby ensuring the construction is not affected by mass water flow. •Enough pathway is expected for vehicle movement so that comfort travel is achieved. •Construction site safety should be ensured to avoid any mishaps or accidents during work periods. •They considered small lumbering and suggested tree plantation initiatives. •They also requested to involve the local community to construction work and they will welcome any outside key labor. •During construction period, alternate route to pass through this area is available. •Since the road is passing alongside homestead gardens and agriculture fields, the intervention will invite air pollution on moderate level during construction period. However, preventive actions and measures can be taken to keep air quality from degrading. • Women should be recruited equally, wherever possible. •Participants, made certain that they will provide surveillance over raw materials and material storage area. •They have also ascertained that the selected site is free from any events related to resettlement and

COMPONENT'S NAME UNDER W-23.11	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
	harm to nearby households or agriculture fields and wash away top soil of adjacent grounds residing Along side the road. It will protect the top soil for future growth of crops and aid vegetable farming or homestead gardens. Abutting the road, the chainage consists of homestead gardens. These features should not be disturbed in construction period. •The participants have expressed their greater interest for this intervention and believes this will bring nothing but prosperity for the entire catchment dwellers. •Household fences along the road should not be affected while construction • No trees should be harmed for preparation of this road • Available pathway to usher material delivering vehicles • Labor shed availability in the target location • Material storage is available	major environmental impacts. The adverse environmental impacts that may come in the way of air quality, noise, solid waste, occupational health & safety during the construction period, and will be of short duration, yet proper management/conservative options should be adopted. • Open spaces are available along the road which can be used for material storage and labor camp. • West dorgabeel road is available as connecting road for material delivery. • Electricity is available and contractor can install tube wells as deemed necessary. • During the development of this road, collaboration with the ADB funded bridge is suggested so that design and requirements do not clash for any reason.

Table 2.3.2: Consultation Meetings Summary

Road Package Number	Date DD-MM-YYYY	Venue	Main Participant Groups	No. of Participants	Remarks (If any)
W23-11	07-10-2020	Alam Store, Hatimora	Host Community	38	-

3. ENVIRONMENTAL SCREENING

3.1 General

This section identifies the potential impacts that the various elements of the proposed Project may have on the physical, biological and socio-economic environment within half a kilometer of the radial distance around the site. Environmental Assessment (EA) based on this screening study for the Sub-project has been conducted to identify and determine which potential Project impacts may be

significant and therefore require the application of reasonable and effective management and/or mitigation measures.

In order to realize the exact physical, biological, socio-economic and environmental impacts of the proposed sub-project sites and the influence area in regards to the implementation measures, an extensive field visit was carried out in each proposed sub-project PIA. Environmental Screening form, as adopted in **Appendix 2** of the Environmental and Social Management Framework of EMCRP, was administered for identifying the impacts and their extents.

The screening data and information for this subproject component and details screening summary have been formulated and shown in **Appendix-01.**

3.2 Major Findings

A complete view of current environmental conditions of individual sub-projects in relation to interested queries has been congregated in order to understand the degree of impacts corresponding with marked interventions. Interestingly, most sub-project has correspondence with its surrounding features and upholds interchangeable impacts. However, the degree is not an interchangeable factor since scale is not parallel to each of these components which is where, mitigation measure differentiation is implied. There are some cases where unique circumstances have been met with while environmental screening took place which is also accounted for and should be a matter of concern for other parts of the ESMF initiative. The significant issues observed for this subproject component is enlisted in following Table 3.2.1 with pertaining impacts. Moreover, impacts that are adventitious has also been embraced for promoting best practices.

Table 3.2.1: Concerning environmental issues relating to each proposed subproject and influence area for W23.11

COMPONENT'S NAME UNDER W-23.11	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
UKHIA HATIMORA ROAD FROM ID-422944058	It is not located within any major environmentally sensitive area.	It will not cause any severe negative effects to the environmental settings of the area neither to important environmental features.
	Construction period will induce air pollution while preparing for bitumen and loading-unloading raw materials. Impacts on air quality during the construction phase may turn to negative. The main impacts include dust generation from crushers, vehicles and the transportation of all types of construction materials.	It will invite waste production which may in turn cause minor air pollution due to deposited dust and airborne particles less than PM_{10}. Dust pollution may slightly suffocate photosynthesis however this can be minimized through regular water sprinkling as suggested in ESMP.
	Noise emission from construction machineries and equipment can cause nuisance to local residents and workers.	The ambient noise level might have potential to increase temporarily and intermittently in the close vicinity of active construction fronts.
	No agriculture, fish farming and significant vegetation coverage is located in the ROW nor	No agriculture land or any forest coverage will get degraded or lost for construction. Liquid

COMPONENT'S NAME UNDER W-23.11	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
	does it stand over such items. Nonetheless agriculture fields and homestead gardens/forest are found beside the road.	waste such as left-over oils or chemicals might run into these adjacent features.
	Construction works will involve chemical usage and preparation of on-site add-ons to the road. Generating scraps and residues.	The runoff from work site may enter existing pond and frustrate the water quality which will be acute however.
	Few amounts of bush (sapling) will be cut down during construction phase at different chainage.	No severe damage will occur or damage to habitat will be faced. It can be managed by introducing small plantation incentives around the proposed location.
	Elephant Movement is not present in the vicinity of the subproject location.	No impact is expected
	No heavy earth excavation work will be involved.	Consequently air, noise and dust pollution will be occurred within a small-scale during construction period only.
	Construction related activities and setting up of labor camps along with associated facilities and their management can cause adverse impacts.	Noise pollution from pilling or drilling, air pollution caused by dust or gaseous emissions from vehicle movement, running of motorized equipment and land clearing, odors and soil pollution from leaking of latrines and fecal sludge, will more likely to take place.
	Chemical spills or improper disposal of construction waste materials due to lack of worker training and misconduct of contractor's safety initiatives.	During the construction period, soil may get contaminated from activities such as handling of hazardous construction materials (such as fuel, lubricants, paints, and solid waste and sewage).
	Vibration effects generated from pilling, drilling or other construction works	Any vibration would result in nuisance effects to nearby faunal species, and but will be localized and temporary and will unlikely to result in structural damages to buildings or walls of the adjacent private properties.
	Sensitive environmental, cultural, archaeological, religious sites within 1 kilometer of site includes including Dorgaplaong GPS (500m) to the North. Ukhiya Degree College (1km), Shailer Dek Mandir(800m), West Daroga Etimkhana/mosque(10m), Patabari Mondir(1km), patabati GPS (1km SW), west dorgabeel graveyard (500m) to the south. Dorgahabeel GPS (500m), Dokaner Mora Jame Mosque (50m), Dorga/Bazar(1km) to the east and Taipalong Madrassa(500m) and Taipalong Graveyard (500m) to the west.	No disturbance to all these establishments/features is anticipated due to construction activities for the sufficient distance from the construction site, and strict construction site management system-including restrictive work schedule during the daytime only, water-sprinkling twice a day on and around the site, safe storage of materials, etc.

A few incidents of human elephant conflict have been reported in 2018. The IUCN has conducted a study on such conflict. With the support from UNHCR, IUCN has been marking elephant routs and corridors and informing local communities and stakeholders of avoiding the marked areas. As part of the mitigation options, different initiatives have been undertaken, such as formation and capacity development of Elephant Response Teams (ERTs); providing equipment to ERTs to divert in-coming elephants; and setting up elephant deterrent tools (e.g. trip alarms and watch-towers). Though the current chances of occurrence of conflicting incidence are zero, any recurrence would be managed by the ERTs and they will be called if there appears any minute possibility to recur. A map of elephant movement is given in Annexure 04.

In order to offset the loss or attenuating the environmental degradation, a set of mitigation measures will be adopted, on top of general practice of standard construction procedure or following the relevant codes of practices.

3.3 Climate Change Impact Screening

3.3.1 General Overview of the area

Cox's Bazar is one of the coastal districts of Bangladesh and is prone to the effects of climate change due to its geomorphological siting and climate induced effects. The hilly tracts of Cox's Bazar could foster further environmental crisis brought on by indiscriminate deforestation and diminishing groundwater reservoirs, which have been taken place in recent months as the Rohingya crisis evolved. A recent study conducted by World Bank[3] has found that Cox's Bazar will be the worst-hit district in South Asia as average temperatures rise and rainfall patterns become disruptive, by 2050, if greenhouse gas emissions continue unabated.

The hilly region of the country, especially the part in Cox's Bazar is characteristically of muddy soil structure, not of any rocky formation and the stability comes from the roots of the trees. Also rainfall, proximity to the sea, elevation, and land cover are very important factors for analyzing the risk of cyclone. Denudation of trees from hilltops in order for the huge settlement of Rohingya people has already increased the vulnerability to the risk of hill collapse by destabilizing the terrain. Also deforestation at a rapid speed uncovers the land and raise the risk of occurrence of cyclones, as forests protect land from high wind and storm surges where demolishing the trees would make the area vulnerable.

Together with the above-mentioned hazardous situation, again due to sudden extraction of huge amount of groundwater, availability of potable water from shallow tube wells that pump water up from about 150 feet has already reached to a critical level. Averting the problem requires new tube wells to be plumbing deeper into the poorly mapped aquifer, but going deeper than 700 feet in some places may cause salt water to contaminate freshwater resources.

In this case, it is possible that a stationary position of the freshwater-saltwater transition zone can be established via proper management of pumping in the confined aquifer.

[3] https://openknowledge.worldbank.org/bitstream/handle/10986/28723/9781464811555.pdf

The groundwater resource is seen to suffer more from the climate change impact. The impact on groundwater due to climate change impact include

- Sea-level rise could result in a transgression of the sea and a loss of land area. This could also lead to the secondary effect of population migration in the new coastal band due to migration of the coastal population from the encroaching sea, thereby increasing domestic water needs in the new coastal area.

- Transgression of the coast implies that saline storm surges of 1 or more meters depth would penetrate beyond the new coast to new land areas. Storm surges transport saline water far inland of the coast and much of this floodwater may infiltrate the ground in areas where the aquifer is not fully saturated. Even where the aquifer is saturated, denser saline water may sink into the aquifer during the flood and later from pools of saltwater that remain following the flood[4].

- It has been identified that the salinity is found in the shallow aquifers along the coastline. So the salinity which are found in the groundwater are of lesser concern as salinity will subside over time

- Several researches show that through modeling of groundwater flow that the depletion of groundwater in the host community will persist up until 2022 and the replenishment of water will take place.

Considering the general climate change effects in Cox's Bazar area and offsetting the aggravating environmental situation due to the mass arrival of Rohingya communities, several specific measures including tree planation in sub-project areas, rainwater harvesting from every disaster shelter, construction of drainage facilities along the road length and installing thunder arrester across the areas, have been suggested and will be implemented.

3.3.2 Site Specific Screening and outcome

Climate Change impact on a particular subproject is tough to deduce as the highest resolution of climate model simulation done over Bangladesh is 50km. Depending on the simulation ensemble of Cox's Bazar district, the temperature and precipitation are likely to increase with time.

Site specific climate change impacts are often not so easy to measure or deduce plausibly while the site is confined to a narrow strip of roadways, and associated mitigation or offsetting measures are really hard to plot on the impact areas, though an overall set of measures are often considered in practical aspect. Fig:1 shows the inundation risk map of the subprojects under W-23, none of the subprojects are in vicinity of the severe river flood inundation area. So the risk of flooding is low around the sub-project area

[4] "Implications of Climate Change for Fresh Groundwater Resources in Coastal Aquifers in Bangladesh", World Bank report.2010

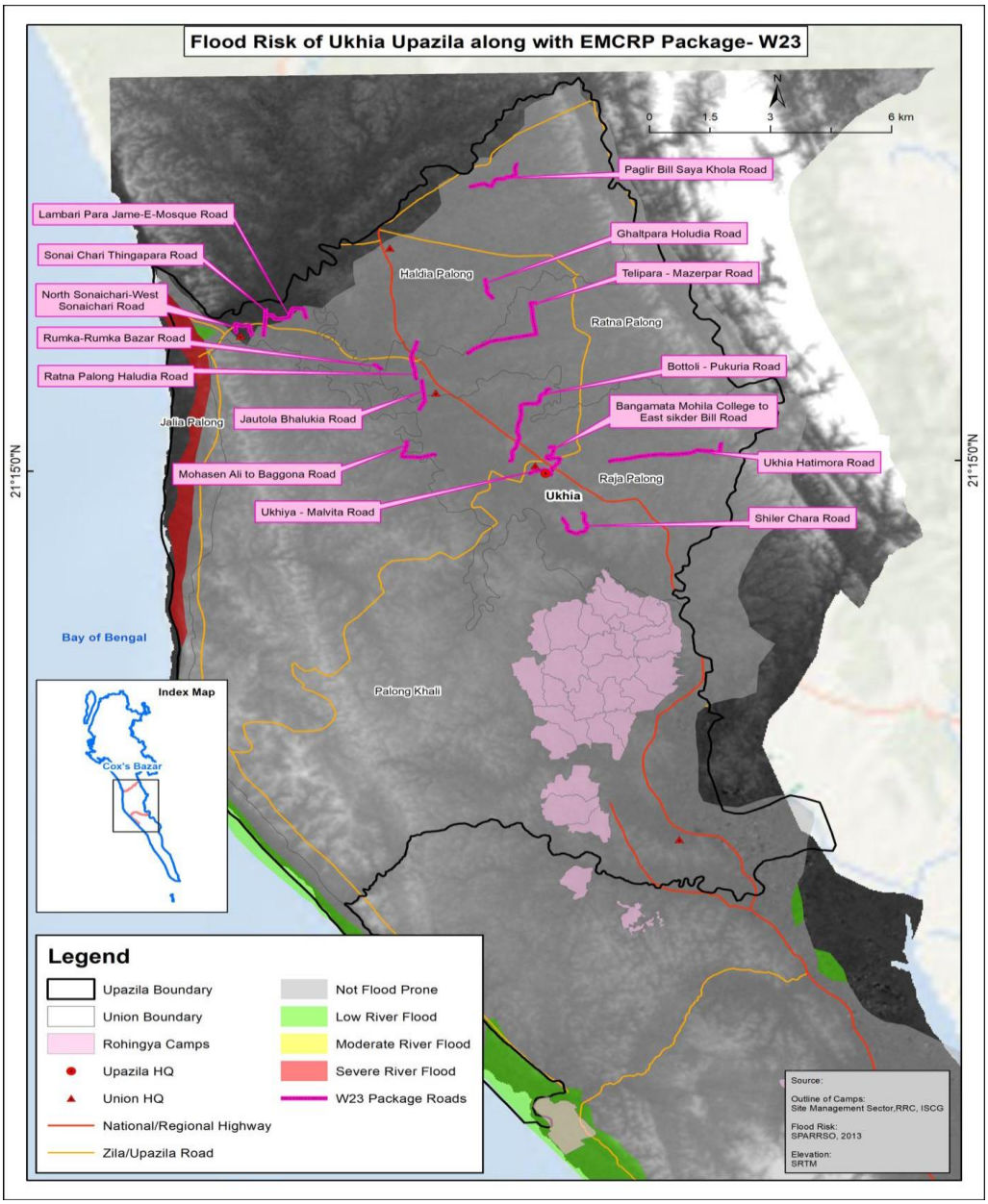


Figure 3.3.2.1: Flood inundation risk map near the subprojects.

Also, in order to avoid the devastation caused by the thunderstorm, state-of the-art thunder arrester (lightning protection system) has been suggested to install having a coverage area of 25,434 sq.m for a single arrester. In addition, tree planation on the road slope/ within the premises is also suggested to sooth the temperature effect and increase the water retaining capacity of soil, at the same time.

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

4.1 General

Considering the environmental settings of the sub-project area, it can be assumed that possible impacts would be largely construction-related, and could be addressed through adoption of good engineering practices; good housekeeping; better *in-situ* construction materials management; and observance of health and safety protocols during the implementation period.

Table 4.1.1: Site Specific Impact and Mitigation Plan under package W23.11

Component's name under W-23.11	Impacts	Mitigation plan
Ukhia hatimora Road from ID-422944058	To the south West Daroga Etimkhana/mosque(10m). To the east Dokaner Mora Jame Mosque (50m). There are settlements as shops and households are located adjacent to the sub-project which can be subject to air pollution. However, none are on the ROW.	Contractor must adhere to the best practice debris management procedure and regular adoption of dust control measures (spraying of water at least twice a day) to minimize the effect to the level best.
	Some part of the proposed road is passing by the agricultural land. **Box culvert** and **cross drain** will be constructed to terminate rainwater for one side to another side during rainy season and also help for rapidly remove excess soil water to reduce or eliminate waterlogging during monsoon and return soils to their natural field capacity and will help to maintain the water balance of both roadside agricultural land to provide a sustainable irrigated agricultural system. It will also help to prevent flood and not to allow water to overflow and also help to divert water for farming. Some high land is found beside the road. So, **L-Drain** will be constructed for drainage high land eel water during rainy season. There are points on the road where slope preparation cannot be done due to having low lying agriculture lands and water bodies. Slope preparation refers to resettlement issues as well in those locations. In such cases **Toe Wall** is proposed which helps to restrain the horizontal surface pressure. This is an adaptation technique and a precaution measure to not allow any damage to sideline existing low-lying features. There are low lands along the road where agriculture fields and ponds are present. This also excludes high chance of soil quality degradation. Some high land is found beside the road where **Retaining wall** will be constructed to avoid landslips and soil erosion.	**03 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 2912.0m, 3746m, 4970m and **04 nos. Cross Drain** (dimension: 0.750mX 0.750m) at Ch. 4389m, Ch. 4483m, Ch.4594m, Ch. 4875m and **02 nos. RCC Box Culverts** (dimension: 2.0mX2.0m) , **01 nos. 2 vent Box Culverts** (dimension: 3.5mX3.5m), **137.0m L-Drain** at different chainage, and **17.0m Toe wall**(105X2.0X2.5)**,** and **RCC Retaining wall** (19m X 3.0m) from ch:4377m to 4396m**. Road safety** work and **Environmental Mitigation and Enhancement** works are also included.

Further construction related activities which may result in adverse impacts in the surrounding environment of the sub project component must be kept under close consideration and appropriate mitigation and management measures will be taken with due care and vigilance. Once the effects are minimized to its least level and controlled efficiently, it will turn into a welcoming and beneficial project for the local communities. The component specific environmental management plans have been outlined in **Appendix-2**. The mitigation measures as well as monitoring program of ESMP have also been incorporated in the management plan.

Environmental quality enhancement: Under the additional financing to the EMCRP project, Forest Department of the Government of Bangladesh will afforest along 200 km of road length area, primarily under the Ukhiya and Teknaf Upazila of Cox's Bazar district in order to offset the environmental and ecological devastation, that had been occurred due to the evolution of Rohingya Crisis, to an achievable level. Many of these road lengths will go through and by the Rohingya Camps, up on the hill and are already denuded of trees or vegetation. Local Government Engineering Department (LGED) will allocate and channelize the finance to the Forest Department under the said additional financing component and oversee the progress of works with due diligence. However, this enhancement work will improve the environmental quality of the area and reinstate some parts of the ecosystem services to those areas, though primarily.

4.2 Health and Safety Measure under COVID Situation

Apart from the established Occupational Health and Safety (OHS) measures being followed in construction sites, offices, and labor camps, a set of additional measures has to be taken and practiced throughout the daily cycle by each labor, staff and any involved parties, due to the ongoing pandemic coronavirus situation. Staffs and consultants at PIU and D&S, along with the pool of consultants under different firms/agencies for different services, and all the representatives or staffs of construction contractors and suppliers have to play much sensitive, (pro-) active and responsible roles in abiding by the rules and measures by themselves and getting the involved workers and different stakeholders adhered to the same. A detailed guideline containing a set of measures with shared responsibilities has been sketched out in order to fight the exposure and further spread of this potentially fatal situation. This plan or guideline shall constitute an integral part of ESMP measures for every sub-project, though is not included in this report to keep it concise and specific, and the contractor is required to keep the copy of that guideline at every site office.

However, among many other relevant issues, the guidelines emphasize on following line of directives:

a. Contractor must designate one of his employees as H&S/Safeguards supervisor to lead, coordinate and interface in order to fight the COVID 19 situation under the direct guidance of COVID focal at PIU of EMCRP project.
b. All workers, supervising and supporting engineers and staffs, consultants, service providers and other concerned parties must adhere to the personal health and hygiene rules, social distancing, and other protective measures in full in order to protect themselves and contain the infections any further. Necessary training and awareness campaign will be aligned with the specific sub-project scenario and prevailing conditions.

c. General practice of cleaning and hygiene has to be maintained in all project/site offices and camp sites, and supply of necessary PPEs and cleaning /disinfecting materials along with proper use of those is to be ensured.
d. Public consultation and stakeholder engagement are to be carried out considering the prevailing risks of virus transmission in the target areas, scope of interventions and level of ICT penetrations among the target stakeholders, and so on.
e. Necessary protocols have to be established and maintained in case of handling a sick employee or worker, and appropriate compensation to a sick disengaged labor is required to be given with due documentation.
f. Budgeting for suggested protective measures, along with necessary supervision and monitoring for the required interventions has to be ensured.

Following the additional health and safety measures presented in that guideline, sub-project component specific BOQ items have been inserted to supplement the budget considering the country-specific situation, capacities, and scope of interventions. The additional cost to Health and Safety Measures under COVID 19 situation is shown in **Appendix-3.**

4.3 Cost of Environmental Enhancement Works in BOQ

In consideration to the above-mentioned environmental impacts and their mitigation measures for this sub-project component, a set of items are included in the BOQ of this sub-project component. Social Safeguard Personnel for Environmental and Social Management for Work Package EMCRP/W23 has also been added in the whole BOQ in order to take supervision and leadership to organize Environmental Management under Environmental Enhancement Works. The total costing and estimation have included enhancements such as Grass turfing plans, Tree plantation initiatives, Dust Suppression mechanisms. On the other hand, in order to ensure health safety and sanitary measures of workers PPE, First Aid Box, Labor shed, Environmental management, drinking water facility with water tests, Temporary latrine for both male and female as well as waste disposal systems has been accounted for. Ensuring sustainable labor performance in regards to environmental and social considerations motivational training has been taken into account. An overview of the estimation is given below and the detailed estimated cost to implement the ESMP is shown in **Appendix-3**.

5. LIMITATION OF THIS STUDY

Bangladesh government has imposed a nationwide lockdown to curb the spread of the novel coronavirus in the wake of series of deaths and infections. Authorities declared a ban on passenger travel on all sector from March 24 while all public transport on roads have been suspended from March 26 to stem the spread of virus, officially known as COVID-19. All office works have been postponed and an intended visit to the sites for further consultation with the relevant stakeholders has had to cancel due to this crisis. Therefore, some relevant information and arrangement needs waiting for recovering this pandemic crisis.

6. CONCLUSION AND RECOMMENDATIONS

The overall conclusion is that if the mitigation, compensation and enhancement measures are implemented in full, there will be no significant negative environmental impacts in regards to the selection of location, design, construction, and/or operation procedure of the proposed component. There will in fact be tremendous benefits from recommended mitigation and enhancement measures and major improvements in quality of life, opportunities in business, trading jobs and ensuring social safety and security will be achieved once the scheme is in operation.

The conclusions of the Screening study can be summarized as follows:

- The communities will receive large benefits through improved infrastructural facilities, transportation & communication etc.
- The short-term negative impacts that may come by the way of air quality, noise, solid waste, occupational health & safety need to be minimized through the management plan.
- The project will create employment for those who live in the vicinity of the construction site and will provide them a short-term economic gain.
- The green belt development, if necessary, for the road site, with large-growing trees at the periphery of the site will give the places a more natural and pleasing appearance.
- A comprehensive Environmental and Social Management Plan (ESMP) has been prepared to mitigate and reduce the adverse impacts that will come out from the Subproject activities.

Implementation of this component will have large positive impacts to the communities in terms of improved infrastructural transportation & communication facilities, which would eventually develop the socio-economic condition of the catchment areas. So, strong recommendation should be put in place to implement the sub-project within shortest possible period of time, and with great care and efficiency.

Annexure-01: Important Environmental Features (IEFs) near site

Detail Environmental features within 100m of the both sides from the center line were collected @300m longitudinal intervals. The findings of the survey for the aforementioned road can be seen in the table below:

Table: Detailed Chainage length and features of the Sub-Project component

Road Name	Ukhia hatimora Road from ID-422944058 **(W23-11)**	**Total Chainage**	2546.0m

Chainage (m)	**Left**	**Right**	**Features**
000-300	L		Shop, crop field, settlement, crop field, bamboo fence, nut tree garden, households, household connecting road to the left, crop field, shop, crop field
		R	Madrassa, brick wall, open space, bamboo fence, swamp, household connecting road to the right, crop field
300-600	L		Crop field, bush, household connecting road to the left, settlement, tin fence, brick wall, settlement, shop, crop field
		R	Crop field, bush, crop field, household connecting road to the right, shop, crop field
600-900	L		Crop field, household connecting road to the left, shop, brick wall, settlement, crop field, shop, household connecting road to the left, crop field, culvert, Electric Pole, crop field, mosque, settlement, bamboo fence, trees, shop, settlement, brick wall, bamboo fence, crop field
		R	Crop field, household connecting road to the right, crop field, electric pole, crop field, electric pole, crop field, electric pole, electric pole, settlement, crop field, shop, household connecting road to the right, crop
900-1200	L		Crop, culverts, crop field, tree, shop, crop field, household connecting road to the left, crop field, household connecting road to the left, Electric Pole, tree
		R	Crop field, electric pole, electric pole, electric pole, crop field, household connecting road to the right, electric pole, tree, crop field
1200-1500	L		Crop field, electric pole, crop field, electric pole, electric pole, electric pole, shop, settlement
		R	Crop field, electric pole, crop field, crop field, bamboo fence
1500-1800	L		Shop, household connecting road to the left, shop, Madrassa, bamboo fence, shop, settlement,
		R	Shop, bamboo fence, crop field, household connecting road to the right, shop,
1800-2100	L		Hatimora community clinic, bamboo bush, rejur khal, proposed bridge from ADB, bamboo fence, trees
		R	bamboo fence, settlement, bamboo fence, earthen household, rejur khal (small stream), bush trees,
2100-2546	L		Settlement, bamboo fence, crop field, bush, crop field, low ground, bamboo fence, bush, crop field, the road turns left, crop field, bush, crop field, garden, high tila, households, settlement, trees, high ground,

			settlement on high grounds, trees
		R	Settlement, bamboo fence, crop field, water stream, bush, bamboo fence, electric pole, crop field, bamboo fence, crop field, mosque (on the right), tin fence, bamboo fence, bush, trees, open space, crop field, bamboo fence, earthen drain

Annexure-02: Attendance of consultation meetings for W23/11

EMCRP/W23.11

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)

Local Government Engineering Department (LGED)

Public Consultation Participants List

Focus Group Discussion

সময়: 10:15 A.M 7/10/2020

উপ-প্রকল্প/কার্যক্রমের নাম: Ukhiya - Hatimara Road

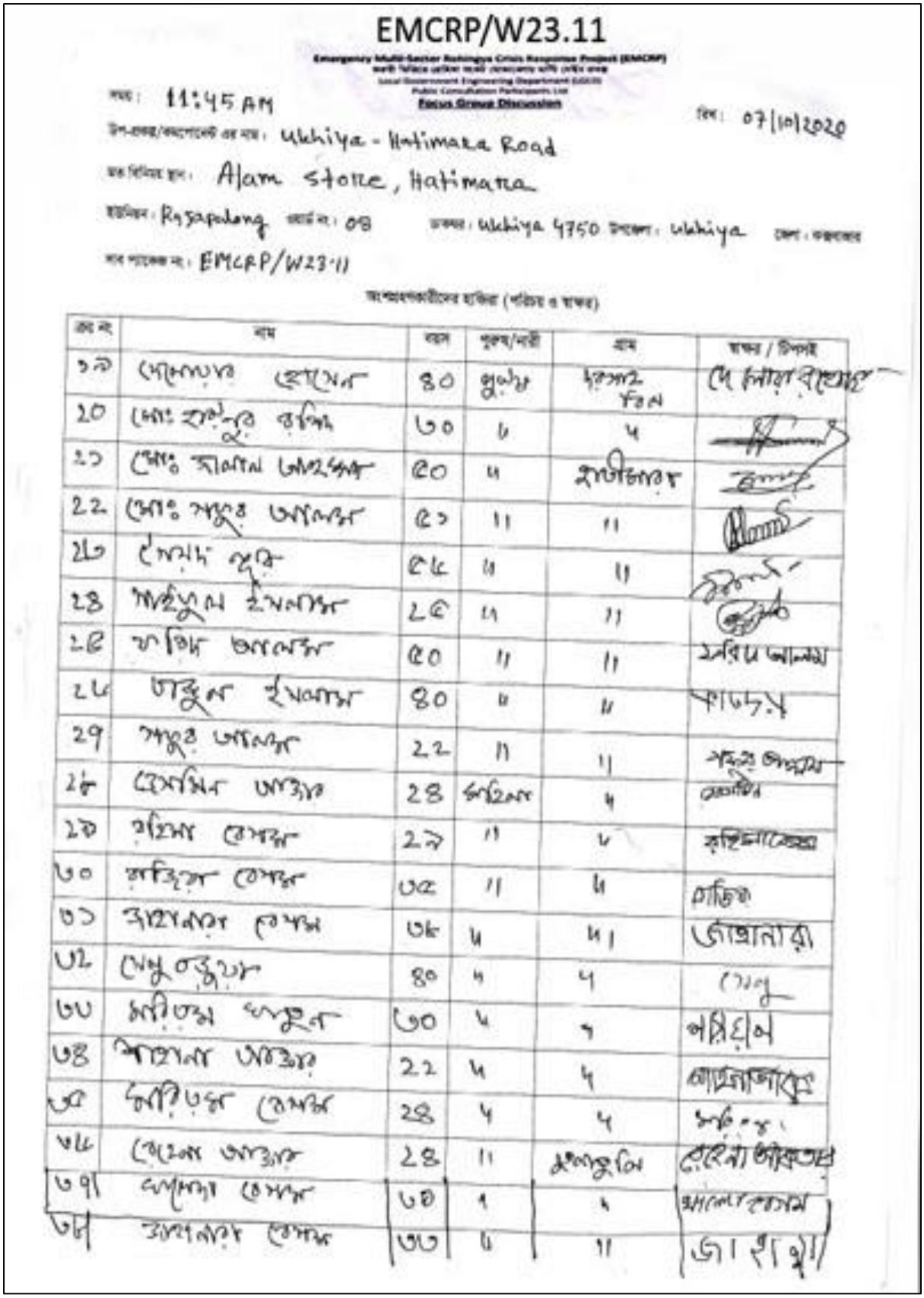
যে স্থানের জন্য: Amin Store, West Dwangabil

ইউনিয়ন: Rajapalong ওয়ার্ড নং: 08 মৌজা: Ukhiya 4750 উপজেলা: Ukhiya জেলা: কক্সবাজার

সাব প্রজেক্ট নং: EMCRP/W23.11

অংশগ্রহণকারীদের তালিকা (পরিষদ ও মৌজা)

ক্রম নং	নাম	বয়স	পুরুষ/মহিলা	গ্রাম	স্বাক্ষর / টিপসই
০১	মোঃ ইমামুল হাসান	৬৮	পুরুষ	পশ্চিম ধনগাং ফিরং	
০২	মোঃ হাবিব	২৭	"	"	
০৩	মোসাম্মৎ ফয়সাল	৩৫	"	"	
০৪	আবু নাছের ইসলাম আহমেদ	৪৪	"	"	
০৫	মোঃ হাফিজ আহমেদ	৫০	"	"	
০৬	মোসাঃ নূরু	১৯	"	"	
০৭	হাবিবুল ইসলাম	২৬	"	"	
০৮	মুনোয়ারা বি	৬৫	মহিলা	"	
০৯	মোসাঃ আমেনা	৭৫	পুরুষ	"	
১০	মোসাঃ আমেনা	৩২	"	"	
১১	আমেনা আমেদা	৮৩	"	"	
১২	মোঃ নুরুল আমিন	২৬	"	"	
১৩	সাদেকুর	২৩	মহিলা	পূর্ব ধনগাংফিরং	
১৪	মোসাঃ আমিনা	২৪	মহিলা	"	
১৫	আহমদ আলী	৫৩	পুরুষ	"	
১৬	আবুতাহের	২৩	"	"	
১৭	মোঃ হারুন	২৯	"	"	
১৮	মুসলিম আমেদ	৬৩	"	"	
১৯।	মোঃ ইকবাল (সমাজ হিতৈষী সদস্য)	৪০	পুরুষ	ধনগাংফিরং	



EMCRP/W23.11

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)

Local Government Engineering Department (LGED)

Public Consultation Participants List

Focus Group Discussion

সময়: 11:45 AM তারিখ: 07/10/2020

উপ-প্রকল্প/কার্যক্রমের নাম: Ukhiya - Hatimara Road

মত বিনিময় স্থান: Alam store, Hatimara

ইউনিয়ন: Rajapalong ওয়ার্ড নং: 08 উপজেলা: Ukhiya 4750 জেলা: Ukhiya জেলা: কক্সবাজার

সাব প্রজেক্ট নং: EMCRP/W23-11

অংশগ্রহণকারীদের তালিকা (পাইলট ও মাঝারি)

ক্রম নং	নাম	বয়স	পুরুষ/মহিলা	গ্রাম	স্বাক্ষর / টিপসই
১৯	মোহাম্মদ হোসেন	৪০	পুরুষ	ঠিকাদার Fan	সে লিখতে পারেনা
20	মোঃ হাফিজুর রহমান	৩০	ঐ	ঐ	
21	মোঃ সালাম ভাইস্কার	৫০	ঐ	ঠিকাদার	
22	মোঃ সফুর ভাইস্কার	৫১	ঐ	ঐ	
23	মোঃ নুর	৫৮	ঐ	ঐ	
24	মইনুল হোসাইন	২৫	ঐ	ঐ	
25	সাকির ভাইস্কার	৫০	ঐ	ঐ	সরিফ আলম
26	আবুল হোসাইন	৪০	ঐ	ঐ	
27	সফুর ভাইস্কার	২২	ঐ	ঐ	
28	মোশারফ ড্রাইভার	28	ড্রাইভার	ঐ	
29	ফরিদা বেগম	27	ঐ	ঐ	
৩০	ফরিদা বেগম	৩২	ঐ	ঐ	
৩১	হাসেনারা বেগম	৩৮	ঐ	ঐ	
৩২	মেমুতরুয়া	৪০	ঐ	ঐ	
৩৩	মরিয়ম খাতুন	৩০	ঐ	ঐ	
৩৪	শাহেনা ড্রাইভার	22	ঐ	ঐ	
৩৫	ফরিদুর বেগম	28	ঐ	ঐ	
৩৬	মোহেনা ড্রাইভার	28	ঐ	ঠিকাদার	
৩৭	মেমেনা বেগম	৩৪	ঐ	ঐ	
৩৮	হাসেনারা বেগম	৩৩	ঐ	ঐ	

Figure: Attendance of consultation meeting for W23-11

Annexure-03: Pictures of sub-project component location and surrounding features with public consultation













Figures: Present condition of Telipara - Mazerpar Road (W23-11) & Public Consultation meeting with Host community

Appendix-1: Environmental Screening Form for examining sub-project component

Environmental Screening Form for Sub-project W23-11

Sub-Project Description Form:

EMCRP/W23- Improvement of 15 roads and construction of culverts with side drains under Cox's Bazar District

Name of Sub-Project: Ukhia hatimora Road from ID-422944058

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Estimated total cost of sub-project (in Taka): 417,036,298.10 Tk.

Estimated construction period duration: 1 year

Estimated total cost of the component (in Taka): **38,674,006.41 Tk.**

Estimated Operation and Maintenance period (life of sub-project): Project design life more than 15 (Fifteen) years but Government policies on how long projects can operate in the camps.

District: Cox's Bazar **Sub-District**: Ukhiya **Union**: Rajapalong

Name of Community/Local Area: West Dorgabeel, Taipalong, Naikhunchori, Shailerdeba, Lambaguna, Kutupalong

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):

The Sub-Project is categorized as a village road-A with a proposed design of Bituminous Carpeting through construction of Earth Work. Interventions include **03 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 2912.0m, 3746m, 4970m and **04 nos. Cross Drain** (dimension: 0.750mX 0.750m) at Ch. 4389m, Ch. 4483m, Ch.4594m, Ch. 4875m and **02 nos. RCC Box Culverts** (dimension: 2.0mX2.0m) **, 01 nos. 2 vent Box Culverts** (dimension: 3.5mX3.5m), **137.0m L-Drain** at different chainage, and **17.0m Toe wall** (105X2.0X2.5), **and RCC Retaining wall** (19m X 3.0m) from ch:4377m to 4396m**. Road safety** work and **Environmental Mitigation and Enhancement** works are also included. Road safety works are also included in the project activity.

Estimated footprint / land area for this sub-project is 12475.4 sq. meter

Brief description of sub-project site: (e.g. present land use, Important Environmental Features (IEFs) near site, etc.:

Proposed road is situated within the catchment area of West Dorgabil, Taipalong, Naikhunchori, Shailerdeba, Lambaguna and Kutupalong stretching 2546 meters. This road starts from west dorgabill road adjacent to west dorgabeel and ends in hatimora area/ tilatoli. Being one of the local communities of Ukhia upazila these locations are very familiar to any other part of rural Bangladesh having mosques, village households, agriculture fields to grow crops and vegetation that serves as subsistent gardening. The surrounding area is dominated with agriculture practices as rice production, betel leaf production, vegetable farming etc. Majority of the surrounding space of this

intervention is covered with homestead gardens and forests. However, there are no significant eco-sensitive features on the pathway of this proposed road.

Overall Comments

The proposed component of the sub-project (Road construction) is not located within any remarkable environmentally sensitive area and will not cause any severe affect to the environmental settings of the area, thus not going to create intimidation to important environmental features. No drainage congestion/water loggings have been observed in the road area. But, some local trees like betel nut tree, rain tree, mango tree, bamboo bushes etc., or additional vegetation may need to clear out due to construction activities, with appropriate offsetting measures to be taken. No agricultural productive soil will be used for the purpose. Earth will be compacted for stabilization. The inputs will be mainly at construction phase and limited within project boundary. Moreover, mitigation measures will be taken according to the ESMP for minimizing the air, dust and noise pollution.

It has been revealed that this project's scopes of works do not intend to overtake their area of lodgment and funding entity has no intention to do so. Moreover, other issue has also been brought to their attention that drainage system and a bridge have also been included into the evaluation of this project since runoff from higher grounds are also a concerning matter during rainy season.

People of the subproject area are very much optimistic about the success of the project and are also eager to participate in the project activities. The subproject is environmentally sustainable and socially acceptable. The local community attended in the participatory public consultation meeting. Their community representatives as teachers, shop owners, farmers and elders have no objection to the construction this infrastructure in the proposed site; the community also appreciated the initiative of LGED to ensure safe access and better portability. The public consultation meeting results confirmed that improvement of this road will increase socio-economic interest in the communities and make lives easier for these people. They also requested to construct the road in accessible width so that small auto and motor vehicles can pass easily. On another matter, locals requested to involve the local community to construction works and material storage monitoring duties.

The road is not located within any identified environmentally sensitive area, and therefore, does not seem to cause any adverse impact on the important environmental features. No significant impact is expected on the ecosystem and biodiversity, no agricultural land/ activities or fish farming will be disturbed, due to the construction of the sub projects. Only forest is found as homestead forest on high grounds of the location.

Types of waste to be generated during construction and operation phase:
During construction period solid waste will be generated due to construction activities. The types of wastes are brick pit, unused sand, wood, gravels, bitumen etc. The types of wastes are gravel, stones, rock, wood, copper wires, concrete, iron, plastic etc. Negligible amount of plastic will come as residue. Moreover, liquid waste will include chemicals of bitumen leftovers, motor oils, used oil, Degreasing solvents etc. Human wastes and kitchen wastes will be generated from labor camps as well.

Sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site including elephant migration routes and remaining forests:

Within the influence area of the subproject no historical sites were identified. Sensitive environmental, cultural, archaeological, religious sites within 1 kilometer of site includes including Dorgaplaong GPS (500m) to the North. Ukhiya Degree College (1km), Shailer Dek Mandir(800m), West Daroga Etimkhana/mosque(10m), Patabari Mondir(1km), patabati GPS (1km SW), west dorgabeel graveyard (500m) to the south. Dorgahabeel GPS (500m), Dokaner Mora Jame Mosque (50m), Dorga/Bazar(1km) to the east and Taipalong Madrassa(500m) Taipalong Graveyard (500m) to the west. Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists.

Mostly human settlements are found around the sub-project area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). Elephant migration routes were about 5-6 km away from this sub-project. No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below

Section A: Sub-Project Overview

Description of sub-project/component interventions:

This intervention will include the following items;

- **03 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 2912.0m, 3746m, 4970m
- **04 nos. Cross Drain** (dimension: 0.750mX 0.750m) at Ch. 4389m, Ch. 4483m, Ch.4594m, Ch. 4875m
- **02 nos. RCC Box Culverts** (dimension: 2.0mX2.0m)
- **01 nos. 2 vent Box Culverts** (dimension: 3.5mX3.5m), **137.0m**
- **L-Drain** at different chainage,
- **17.0m Toe wall** (105X2.0X2.5),
- **RCC Retaining wall** (19m X 3.0m) from ch:4377m to 4396m
- **Road safety** work and **Environmental Mitigation and Enhancement** works are also included (description of such items can be found in BOQ)

Sub-project Location:

Important Features	
ID	422944058
District	Cox's Bazar
Upazila	Ukhiya
Union	Rajapalong
WARD	07 and 08
Proposed Chainage	2546m
Road Type	Village Road-A
Proposed Intervention Type	BC
Distance from Upazila HQ	01km
Road Starting Point Coordinates	Latitude: 21.25072^{0} N

and name	Longitude: 92.15372^0 E Road starts from West Dorgabeel road
Road Ending Point Coordinates and name	Latitude: *21.25546^0 N* Longitude: *92.18069^0 E* Ends in Tolatoli in Hatimora area

Land ownership
Government Land

Expected construction period: 1 Year

Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water bodies, etc. and historical or socio-cultural assets): Please also explain any analysis on alternative location was conducted:

Dorgaplaong GPS (500m) to the North. Ukhiya Degree College (1km), Shailer Dek Mandir(800m), West Daroga Etimkhana/mosque(10m), Patabari Mondir(1km), patabati GPS (1km SW), west dorgabeel graveyard (500m) to the south. Dorgahabeel GPS (500m), Dokaner Mora Jame Mosque (50m), Dorga/Bazar(1km) to the east and Taipalong Madrassa(500m) Taipalong Graveyard (500m) to the west.Within the influence area of the subproject no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (checked with local IUCN representative).

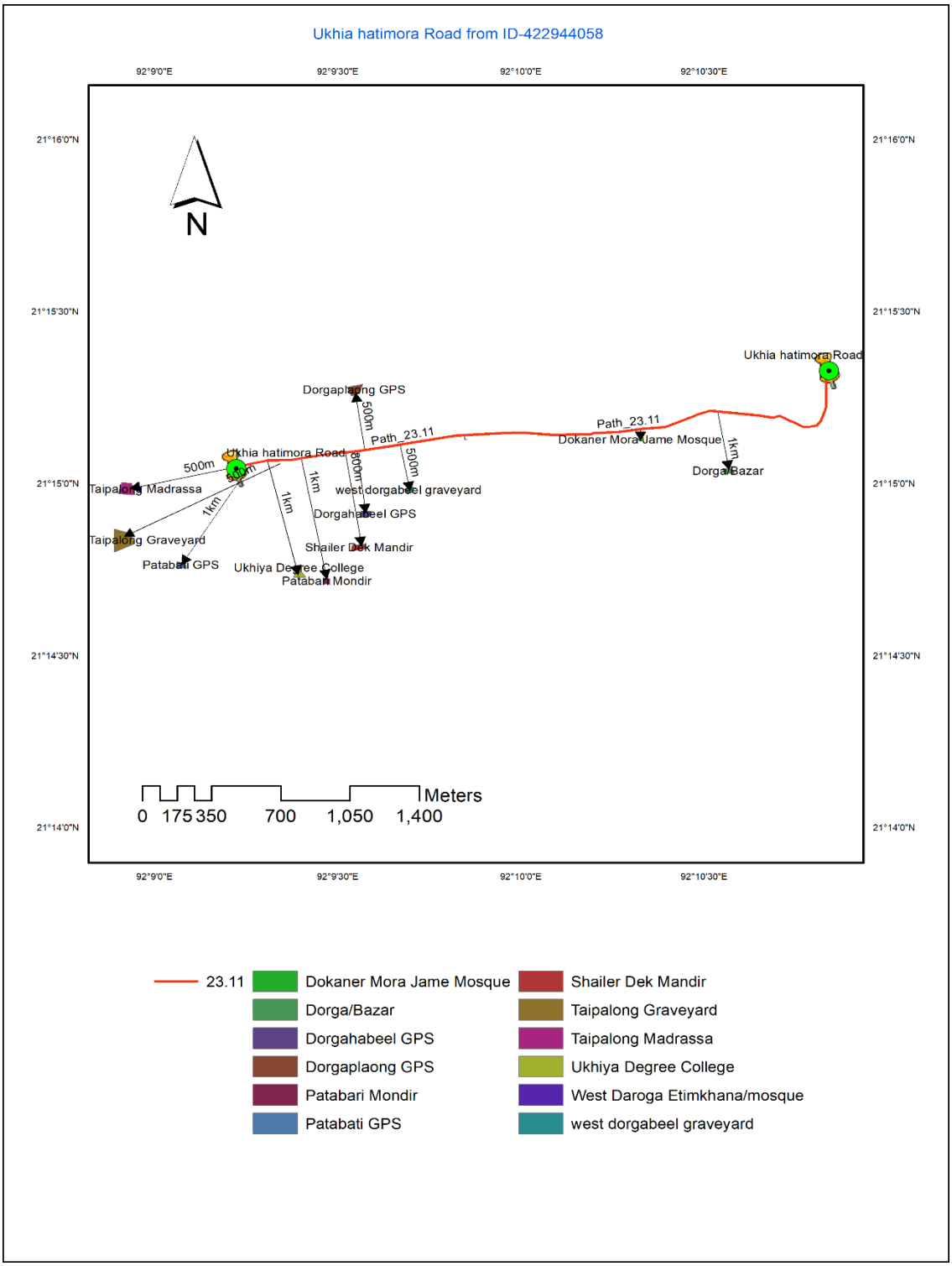
Section B: Environmental Screening

***B.1*: Environmental feature of sub-project location**

Description of cultural properties (if applicable, including distance from site):
Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests:

Dorgaplaong GPS (500m) to the North. Ukhiya Degree College (1km), Shailer Dek Mandir(800m), West Daroga Etimkhana/mosque(10m), Patabari Mondir(1km), patabati GPS (1km SW), west dorgabeel graveyard (500m) to the south. Dorgahabeel GPS (500m), Dokaner Mora Jame Mosque (50m), Dorga/Bazar (1km) to the east and Taipalong Madrassa(500m) Taipalong Graveyard (500m) to the west.There are no other sensitive environmental, cultural, archaeological sites within the catchment area of this sub-project.

A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas are shown below.



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive features found in the footprint area, except matured vegetation on the sides of the road which are homestead gardens and forest. Several mosques, madrasa and local settlement were found during the survey. It will not be affected by the

construction works, as the activities will be carried out within the existing subproject boundary and necessary preventive and mitigation measures will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*

No. There is no existence of Elephant corridor/ route now, which have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) potential impacts on remaining forests in/around camps Yes/No
N/A (This activity will be confined within the existing subproject boundary)

(3) Other issues: N/A

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:
Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of vehicle-related pollutants 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/ preventable by mitigation measures.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, tractor, trailer, etc. move on roads adjacent to sub-project throughout the day and night generate noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation):

Landslide potential is low. There is low possibility of soil erosion or landslide during construction period of targeted sub-project. The impacts are negative but very small scale, site-specific within a relatively small area and adjustable by mitigation measures.

Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH): Groundwater is the main source of potable water in the Sub-project area. The shallow depth is about 100 feet to 150 feet and deep tube well depth is 700 to 800 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 600-800ft (Field survey, 2019). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer. Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)
Status of wildlife movement: **N/A** (None of the information was found about the wildlife movement in or across the area)
State of forestation: Patches of vegetation containing large and matured trees are present in local and homestead gardens across the road side of the proposed subproject area which are located within 200m radial distance.
Summary of water balance analysis (For water supply scheme only): **N/A**

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g. status of access road or any other facility required for sub-project to be viable): An access point called West Dorgabeel road is available. It is possible to carry construction materials on these roads to the construction site with limited traffic flow to avoid congestion.
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction: Toilet and water supply facilities will be ensured by the contractor in the vicinity of the construction area for all the components of the sub-project, electric connection will be established with the accommodation facility due for the workforce. Electricity is available in the area.
Possible location of labor camps: Labor camp can be established along the road since there are available open private lands. However, this will have to be done with the consent of land owner under a mutual agreement, with the supervision of the Engineer in charge.
Requirement and type of raw materials (e.g. sand, stone, wood, etc.):

i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction.
Identification of access road for transportation (Yes/No): Yes. West dorgabeel road is available as connecting road
Location identification for raw material storage: Adjacent to labor camp or different location is available. However, this will need placement on open fields and should be consulted with local committee. Material storage area must be well fenced and materials will be covered with tarpaulins.
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.): Earth/ mud, plastics, brick chips, dust from bricks during construction of project components will be produce. Also, sludge will be produced from labor camp latrines and kitchen waste mostly composing of organic matters as fiber, starch, carbohydrates and proteins. 10% of the kitchen waste may be classified as plastics or non-biodegradables. Solid waste may amount to 20 kg daily and sludge may amount to 5 kg per day.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g. Solids wastes, liquid wastes, etc.): **Solid waste:** Residual waste from the labor camps will be generated. Equipment maintenance/vehicles on-site and scrap material will occur during construction works which are mostly solid waste. Leftover oils or spills from machinery can be a high probability generating liquid waste. Waste from civil works. And the quantity will be tentatively 150 kg. **Liquid waste**: During construction period fecal sludge will be generated from the labor camp and the quantity would be nearly 6 kg per day, which would be reduced in weight in course of time. Leftover oils or spills from machinery can be a high probability generating liquid waste.
Type and quantity of raw materials used (wood, bricks, cement, water, etc.): **Type:** i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction. **Quantity**: It is difficult to give exact figures of construction waste produced on a typical construction site.
Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards:

Among the last quarter of the road chainage there are high grounds or tila with small plants which may need adjustments. Other than this, No other vegetation is present in the right of way. Specific soil amount is not needed for the project. The current condition explains that there is no aggregated soil on the right of way.
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) The possibility is Medium, for stagnant water bodies to occur. Because water usage will be higher during the construction period. By default, this area has no water logging troubles due to being natural channels. Moreover, no possibilities of stagnation of water in long run. So, local communities have stated that they do not have severe troubles with mosquitos or other disease vectors.
Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No pre-existing waterbody or drainage is present
Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. Because under this intervention, there is very little scope of damage to terrestrial or aquatic ecosystems or endangered species.
Activities that can lead to landslides, slumps, slips and other mass movements in road cuts: Scope of work leading to low scale effects of landslide. The impacts are negative but short-term and site-specific. It can be managed through mitigation measures.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description) Low, since both sides of the road is more or less similar elevation. The concentrated outflow will be managed since the sub-project has included drains.
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials. The existing HBB and BFS part of the road is adequate for traffic movement however, contractors will have to maintain traffic plan so that local transports do not find it difficult to pass during construction work.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm).

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: No
Chance of long-term or semi-permanent destruction of soils: (High/Medium/Low with description) No
Possibility of odor and water, soil quality impacts from SWM and FSM disposal system: (High/Medium/Low with description)

No
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) There is no possibility of stagnant water bodies remained for encouraging mosquito breeding and other disease vectors, during the operation phase.
Likely direct and indirect impacts on economic development in the project areas by the sub-project: Construction or implementation of a road project substantially contributes to the development of the project areas. It surely improves the communication network, reduces the transport time, increases the trade and business in/around the areas, and ensures access to better living conditions with amenities, better educational and job opportunities and health facilities. Thus, the direct and indirect impacts on economic development in the project areas would be enormous by this sub-project.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No existing drainage channels or surface water bodies found in the project area; therefore, no such effect can be anticipated
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. There are no protected areas in or around project sites, and no known areas of ecological interest.
Activities leading to landslides, slumps, slips and other mass movements in road cuts: The entire sub-project component area is nearly flat; thus, no such type of impacts is anticipated.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) No
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: Improved communication will definitely increase the traffic/ vehicular movement, which must increase the light and noise pollution, but air pollution effect will not be increased significantly, as the proposed BC road will reduce the pollution generated from dust on the muddy road, especially during the dry season and if the vehicles are maintained in good conditions

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

Section D: Environmental Screening Summary of the Work Package-W23.11

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
1: Sub-Project Interventions	**Air quality**	Under the subproject intervention the overall score is **low**.	• Limiting earthworks; • Watering of dry exposed surfaces and stockpiles of aggregates at least twice daily, as necessary; • Requiring trucks delivering aggregates or bricks and cement to have tarpaulin cover and Limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Covering of trucks; • Records of air quality inspection;	Visual monitoring of air quality and if requires, air quality test (CO, $PM_{2.5,10}$) once in construction period in winter season.
	Soil impacts	Under the sub-project intervention the overall score is **low.**	• Precautions might be taken when rainstorms are likely, when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms. • The earthwork sites where exposed land surface is vulnerable to runoff shall be consolidated and/or covered. • The material stockpile sites shall be far away from surface water bodies and areas prone to surface run-off. Loose materials shall be bagged and covered. • Channels, earth bunds, netting, tarpaulin and or sand bag barriers	Construction Contractor monitored by Consultant and PIU	• No visible degradation to nearby drainages, • *khals* or water bodies due to soil erosion. • Rain storms in construction phase.	Monitoring as weekly basis.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
			shall be used on site to manage surface water runoff and minimize erosion. • The overall slope of the work areas and construction yards shall be kept to a minimum to reduce the erosive potential of surface water flows elsewhere.			
	Hydrology (surface and groundwater)	Under the subproject intervention the overall score is **low**.	• All precautions to store chemicals/oil/fuel properly so that no chance of spill. • Workers must specify waste dump locations to avoid littering which in turn might negatively affect surface and ground water. • Monitor water quality according to the environmental management plan.	Construction Contractor and monitored by Consultant and PIU	• Areas for stockpiles, storage of fuels and lubricants and waste materials; • Records of water quality inspection; Water Quality Test • (National Drinking Water Quality Standard Parameters)if requires; • No visible degradation to nearby drainages, *khals* or water bodies due to construction	Water quality test (mainly GW) twice during the construction period in six months interval.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
					activities. • Records should be kept and logged.	
2: Pre-construction Phase	**Sanitation, water supply**	Under the subproject intervention the overall score is **low**.	• Provide suitable housing, adequate supplies of potable water, and toilet and bathing facilities within labor camp area for the assigned laborer. • Provide means for disposing of wastewater from toilets, baths and food preparation areas either through a septic tank and soak away, or holding tank with removal by vacuum truck. • Records for any type of training or awareness building sessions must be kept at site.	Construction Contractor and monitored by Consultant and PIU	• Site-specific H&S Plan; • Records of supply of uncontaminated water; • Record of Health &Safety orientation trainings; • Condition of sanitation facilities for workers	Visual inspection by PIU and supervision consultants on monthly basis
	Transportation	Under the subproject intervention the overall score is **low.**	• Contractor should verify vehicles for the suitability of carrying, loading and unloading of materials	Construction Contractor and monitored by Consultant and PIU	• Record of regular inspection. • Record of accidents/incidents	Monthly monitoring.
	Storage of construction	Under the subproject	• Orienting concerned person and team assigned for the construction	Construction Contractor and	• List of materials and sources of	During implementation

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
	materials	intervention the overall score is **low**.	work.	monitored by Consultant and PIU	materials;	phase, as necessary with discussion with PIU, Consultant
3: Construction Phase	**Wastes**	Under the sub-project intervention the overall score is **low.**	• Prepare and implement on-site waste water runoff and labor camp waste management plan approved by PIU and consultants. • Wastes must be placed in the designated bins which must be regularly emptied. These shall remain within demarcated areas and shall be designed to prevent wastes from being blown out by wind. • All waste must be removed from the site and transported to a disposal site.	Construction Contractor and monitored by Consultant and PIU	• Complaints from community; • Regular inspection of waste management activity; • Waste disposal record.	As work weekly progresses
	Cut and fill Activities (Cutting of hill slope and earth removal from borrow areas caused for soil erosion and landslides)	Under the sub-project intervention, the overall score is low.	• During construction cut and fill will be balanced as far as is possible. Designs shall ensure that as far as possible all cut and fill activities are balanced • Proper care will be taken during cutting and filling so that slope or toe of the road embankment remain within the right of way and does not disturb the crop.	Contractor, environmental specialist of D&SC	• Location of road alignment and slope.	Daily as work progresses

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
	Storage of materials	Protected and safety storage to be needed for construction materials storage. Not interrupt natural land contours, disturbance in natural drainage patterns and logging of water and the overall score is **low.**	• With the assistance from site management committee in Camp to identify the storage site and other requirements, which will be approved by PIU and consultants.	Construction Contractor and monitored by Consultant and PIU	• List of materials and sources of materials; • Storage areas for materials and equipment.	Monthly basis during implementation phase, as necessary with discussion with PIU, Consultant
	Removal of Vegetation (May cause soil erosion and their deposition on nearby crop field, affecting soil quality and productivity)	Under the sub-project intervention, the overall score is **low.**	• If during detailed design cutting of trees is required, compensatory plantation for trees lost at a rate of 5 trees for every tree cut. • Prevent workers or any other person from removing and damaging any flora (plant/vegetation) and fauna.	Contractor, environmental specialist of D&SC	• Complaints from community;	Daily

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
	Noise pollution	Under the subproject intervention the overall score is **low.**	• Consultation with affected people; not to operate noisy equipment during working period; • No noisy work after 5.00 pm. • Sound suppression for equipment; • Ear protection for workers. • Conduct noise quality monitoring as per EMP.	Construction Contractor and monitored by Consultant and PIU	• Number of complaints from stakeholders; • Use of silencers in noise-producing equipment and sound barriers; • Noise Level following decibel meter (dB)	Inspection by PIU and supervision consultants on monthly basis;
	Air pollution	Under the subproject intervention the overall score is **low.**	• Water spraying for dust control; construction materials with potential for significant dust generation shall be covered; no smoke emitting equipment; and limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor and monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Records of air quality inspection.	Visual observation and monitoring of air quality during construction period.
	Road Safety and Accidents	Under the subproject intervention the overall score is **low.**	• Erection of suitable signage at construction sites • Direct observation and discussion with local people • Restrict the transport of oversize loads. • Operate construction vehicles to non-peak periods (night) to minimize the traffic disruption. • Enforce on-site and access road speed limits.	Construction Contractor, environmental specialist of D&Sc.	• Complaints from communities, pedestrians	Day basis during work time

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
			• The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc. • Local residents should be kept informed about planned Works			
4. Post Construction	**Road Safety**	Under the issue the overall score is **low**.	• Install traffic signs for speed limit, speed breaker where needed, Mile post and create adequate ***traffic*** detours, and sufficient ***signage*** & ***warning*** signs, Post speed limits and suitable bending on the road. • The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc.	Construction Contractor, environmental specialist of D&Sc	• Road signage and safety instruments at suitable locations and chainage	Immediately after the construction work is over.
	Tree re plantation	Under the issue the overall score is **low**.	• Replantation of trees during monsoon period • Maintain of trees properly • Check survival of trees and replant the dead trees	Construction Contractor, environmental specialist of D&Sc	• Number of complaints from stakeholders; • Records of trees number and tree plantation inspection;	Immediately after the construction work is over.
5. Operatio	**Maintenance of road and**	Under the issue	• No advertisement/boardings shall be allowed within the Right of Way	LGED	• Number of complaints from	During Operation under LGED's

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
nal Phase	**assets** (Road accidents may increase due to higher number of vehicles using the roads at increased speeds)	the overall score is **low**.	limits of the project road. • Regular maintenance and cleaning of assets such as sign boards, road safety sign etc. shall be undertaken. • Clear smooth speed breaker/rough surfaces should be clear in views. • Regular maintenance of road surface and shoulders.		stakeholders;	regular maintenance program in each 3 years.

* Overall Impact Score: High = Likely to cause long-term E&S impacts; Medium = Likely to cause temporary impacts; Low = Likely to cause little, short-term impacts

**Post-construction phase denotes the time period contractor use to clear and clean up the sites after the construction work is ended, perform tree plantation, grass turfing, and minor rectification till the official handing over the site to LGED, or owner of the site.

Recommendation for further environmental and social assessment and/or site specific environmental and social management plan: Yes

**If yes, please specify what assessments/plans would be required.* Mention some recommendation on E&S assessment …. ESMP

If site specific environmental and social management plan (ESMP) is followed the impacts can be mitigated and monitored. ESMP is attached.

Appendix-2: Environmental and Social Management Plan (ESMP)

ESMP for Access and evacuation Roads; *(LGED/EMCRP-W23.11): Telipara - Mazerpar Road ID-422944050*

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
Pre-Construction Stage	Loss of land / and other physical assets	• No land acquisition is allowed within this sub-project activities So, there are no any mitigation measures according to this impact.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of livelihood	• Under this subproject, there is no scope of negative impact of adjacent livelihoods	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Stakeholders Engagement	• All of the project stakeholders should be consulted • Separate community level consultation meeting with the potential affected HHs • Consultation meeting with host communities about the project objectives and scope of works	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of right to access	• Project to ensure thorough analysis of alternatives that access enjoyed by the community remains intact. • In case of unavoidable circumstances, alternative access will be provided.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Site Selection & implementing interventions: Human-elephant conflict	• Selection of sub-project sites and all implementing interventions must take place outside of the elephant corridor/influence area.	PIU	Environmental Consultant of PIU, PSC
Pre-Construction Stage	Site Preparation: Soil Erosion; Alteration of natural drainage	• Our selected sites avoided the low land near the water bodies or natural flow path to avoid the flash flood or any kind or surface runoff.	PIU & Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Tubewell location within the construction site is not near to any kinds of latrine and soaks well which could be contaminated by those. • After completing the development, we restored the place as like before to avoid the cut and fill operational problems. • This site is in the local community, so we discussed with the local community to avoid any conflicts related local habitation, culture. • Sub project intervention mustavoid of natural disturbance of existing slop and natural drainage. • The contractor ensuring sound environment for the local residents near the sub project site.		
Construction Activity	Noise from construction works	• Construction activities mostly will finish at day time within 05 PM, and must confirm proper measures for avoiding any disturbance. • All Personal Protective Equipments (PPEs) must be ensured in sites before starting any kinds of construction works.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Dust	• Acceptable range of emission of CO, particulate matter [SPM (**Suspended particulate matter)**, PM2.5, 10] and Hydrocarbons must be maintained through good construction work practices • Dust generation must be limited as a result of clearing, leveling and site grading operations with using water florescent manually and through water	Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		pipes. • Dust generation due to vehicle movement on connecting road shall be controlled by watering the path at limited level		
Construction Activity	Safety Issues	• Unauthorized entry is completely prohibited in our site and take necessary measures for preventing this problem • Before works started Contractor must provide proper training and guidelines on health and safety issues to the labors and associated staffs. • Records of every training must be kept at site. • All kinds of Child labour are completely prohibited in every site. • Every construction materials storage site will be well fenced by Tin and safety caution tape.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Traffic Management	• Contractors will maintain proper route for traffic management which is to beconsulted with and confirmed by the Executive Engineer of Cox's Bazar.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Conflicts with existing users due to the scarcity of resource base.	• A detailed assessment of the available resources and consent of the local representative for withdrawal of water from existing surface water sources shall be taken. • If ground water is withdrawn, adequate approvals from the appropriate department need to be undertaken before setting up bore wells. • Any type of consent letter or agreement for	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		withdrawing water from either surface or underground sources will be kept on site. • Local community must be consulted before any construction works starts.		
Construction Activity	Increase in road accidents	• Maintain safety measures during the movement of heavy machinery and equipment. • Local community will be trained up on traffic management and awareness.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Labour Base Camp: Conflicts with the local residents	• Awareness building session will be undertaken about prevention of child abuse, child marriage, GBV, sexual harassment, trafficking of women and children as well as illegal drug trade. Written records of this awareness building session shall be kept on site. • Work force should be prohibited from disturbing the flora, fauna including hunting of animals, wildlife hunting, poaching and tree felling. • Adequate facilities ensuring sanitation for labour camps will be put in place • Treated water will be made available at site for drinking purpose. • Adequate accommodation arrangements for labour forces. • Labor code of conduct is to be disclosed through consultation.	Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Construction Activity	Waste Management: Improper management and handling of	Preparation of a waste management plan covering the following aspects:	Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
	hazardous and non-hazardous waste during construction.	• Residual waste from the temporary accommodation facilities for labor Waste and from equipment maintenance/vehicles on-site • After completion of construction works. So, recycling process is not applicable. • Proper consents for hazardous waste management.		
Construction Activity	Health & Safety Risks: • The potential for exposure to safety events such as tripping, working at height activities, fire from hot works, smoking, failure in electrical installation, mobile plant and vehicles, and electrical shocks. • Exposure to health events during construction activities such as manual handling and musculoskeletal disorders, hand-arm vibration, temporary or permanent hearing loss, heat stress, and dermatitis.	• All construction equipment will be properly inspected timely. • The risk assessment will be prepared and communicated prior to the commencement of work for all types of work activities on site. • Preparation of proper walkways and clearly designation as a walkway has to be ensured; all walkways shall be provided with good conditions underfoot; signposted and with adequate lighting. • Proper Signpost at any slippery areas will be ensured in construction site. • Fire extinguishers will be located at identified fire points around the site. The extinguishers must be appropriate to the nature of the potential fire. • This sub project has Proper communicative emergency response plan (ERP) with all parties, the ERP to consider such things as specific foreseeable emergency situations, organizational roles and authorities' responsibilities and expertise, emergency response and evacuation procedure and personnel will	PIU & Contractor	Environmental Consultant as well as Social Development and Gender Specialists of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		be trained and drilled to test and ensure the coherence with the plan. • All people of construction site will be concerned about the safety and maintenance of Electrical equipment; works will be carried out on live systems. • Provision to first aid box in sub-project areas will be ensured. • Proper Emergency evacuation response plan will exist in sub-project area. • All safety equipment will be available in sub-project site (safety, size, power, efficiency, ergonomics, cost, user acceptability etc.), the lowest vibration tools will be provided that are suitable and can do the works. • Awareness training will be given to all personnel involved during the construction phase in order to highlight the heat related illnesses of working in hot conditions such as heat cramps, heat exhaustion, heat stroke, and dehydration. Written records of this awareness training shall be kept on site. • Adequate quantities of drinking water will be available at all Sites, on different locations within the site. • Provision to maintain proper PPE wherever necessary and to ensure that there are satisfactory washing and changing facilities. • Provision to ensure all workers exposed to a risk are aware of the possible dangers and also given thorough		

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		training on how to protect themselves and there should be effective supervision to ensure that the correct methods are being used.		
Operation &Maintenance	Noise disturbances to fauna	• Provision to maintain noise and vibration from the operation and maintenance of machinery and equipment by proper monitoring and measures. • Provision to take necessary lighting, caution for the works and necessary maintenance should be done in day light.	PIU	Environmental Consultant of PIU, PSC. Union Member
Construction activity	Odours and pollution caused by leaking latrines and faecal sludge, and solid wastes impacting surrounding water bodies, flora and fauna	• Preventative maintenance schedule should be followed. • Solid organic wastes should be stored in bins and/ or skips and emptied regularly at a designated waste disposal area away from the camp site. If no designated site is available within the reach, a dug-hole at a nearby place can be used with periodic filling with soil layer for preventing pollution and generating nutrient rich compost soil over time.	PIU	Environmental Consultant of PIU, PSC. Union Member
Decommissioning during the project implementation period (including site clearance after the construction)	The impacts are similar to those listed in construction stage: • Pollution from waste materials • Health & Safety risks to workers and local community	• Contractor must prepare a demolition and waste management plan including following directive aspects given hereunder.	PIU / Contractor	Environmental Consultant of PIU, and Executive Engineer of Cox's Bazar

Waste Management Plan:

The Contractor shall develop a waste management plan for various specific waste streams (e.g., reusable waste, flammable waste, construction debris, food and organic waste etc.) prior to commencing of construction and submit to LGED for approval. The plans must include following principles or series of actions, which will be carried out/followed by the contractor and supervised by the Field level Environmental Specialist and Social Development Specialist.

For wastes:

- The quantity of waste materials shall be minimized by 3R (Reduce, Recycle and Reuse) approach, and wastes shall be segregated accordingly, wherever practical; and stored in designated places/facilities in the site.
- Construction site shall be maintained in a cleaner, tidy and safe condition and appropriate facilities shall be provided and maintained as temporary storage of all wastes before transportation and final disposal.
- Hazardous waste viz. waste oil etc. will be collected and stored in a paved and bounded area and subsequently sold to authorized recyclers.
- The scrap material generated from related construction activities will be collected and stored separately in the stack yard and sold to local recyclers.
- All wastes generated during construction shall be disposed off in an environmentally acceptable manner. This will include consideration of the nature and location of disposal site, so as to cause less environmental impact.
- Other leftover non-hazardous wastes, including construction debris shall be transported to an approved disposal site by pick up tracks or back loaded vehicles with proper care.
- Organic wastes produced in the camp site during the construction period shall be collected and transported in vehicles covered with tarps or nets to prevent spilling waste along the route to the designated disposal site;
- Burning of any type of wastes in the construction site shall be prohibited completely.

Prepared by: Harogopal Kabiraj, Environmental Focal Person, +8801714980171

Tanvir Ahsan Haque, Environmental Specialist, +8801688117059

Ms. Sadia Azad, Disaster and Climate Change Specialist, PIU.

Reviewed by: Md. Saiful Islam, Field Level Environmental Specialist, +8801913442006

Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.11

In consideration to the above-mentioned environmental impacts and their mitigation measures for all sub-projects, individual BOQ for each component has been prepared. Following tables will illustrate such items of enhancement and impact mitigation works as well as considering the emerged situation of COVID-19, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites.

Cost of Environmental Enhancement Works for W23-11 in BOQ

Sl no.	Description of item	Quantity	Unit price	Total amount
1.	**Grass Turfing** Turfing on embankment top and slope & any critical place with good quality turf supplied by the contractor of not less than 225mm square in dimension including placing and watering till grass is fully grown, etc. all complete as per direction of E.I.C. (Payment to be made only when grass is fully grown)	7507 Sq.m	@38.15 Tk. Per sqm	286399.68
2.	**Dust suppression measures** Dust suppression measures like water sprinkling on aggregates/unpaved roads, in and around the work site and as per direction of E-I-C	2546m	@ 2.56 BDT	6517.76
3.	**Water Supply and Sanitation** Providing and maintaining adequate portable water supply, sanitation, and cleanliness facilities at camp site and work site to the entire satisfaction of Engineer-in-charge. Temporary Toilet: Construction of temporary toilets in work site/ rest area complete as per design and specifications and approved by the Engineer-in-Charge. There should be 1 camp in each site. In each camp, there should be 1 no of toilet for women and 1 no of toilet for men.	2 nos.	@12822.86 per toilet	25,645.72
4.	**First Aid Box** Supplying, equipping and maintaining adequate first-aid box throughout the working period at worksite and site office, and erect conspicuous notice boards directing where these are situated and providing all requisite emergency medical first aid kits, including complying with the	1 no.	LS @5000 Tk. Per box	5,000

	government medical or labour requirements at all times, and provide, equip and maintain necessary dressing kits throughout the working period for attending minor injuries, etc. all complete as per requirement and full satisfaction of Engineer-in-charge.			
5.	**Drinking Water Facilities** Providing continuous adequate drinking water supply at worksite and site office as well by installing necessary tube-well/s where applicable or any other means depending on local situation, also providing essential arrangement for storing drinking water by supplying portable best quality water tank equivalent to Gazi/Padma of adequate capacity depending on the number of users, including supplying 1 (one) no. best quality water filter of minimum capacity 30 liters with necessary kits, etc. all complete as per satisfaction and direction of the Engineer-in-charge.	2 no.	LS @ Tk. 30,000	60,000
6.	**Traffic Management** Maintaining traffic management at worksite from time of commencement of contractor's activities to time of completion activities, including ensuring that the road is safe for users, providing a safe working area for those involved in work on trafficked network and minimizing any disruption to smooth flow of traffic (this includes providing necessary barricades, warning signs/lights, guide signs, flagmen, maintaining diversion roads by cutting, filling, constructing, etc. or by any other means) in accordance with the full satisfaction of the Engineering-in-charge.	1 no.	LS @ Tk. 15,000	15,000
7.	**Personal Protection Equipment for Workers** Providing and maintaining appropriate (safe design, fit and comfort) personal protection equipment (PPE) to ensure the highest possible protection for employees in establishing and maintaining a safe and healthful working environment at workplace, including demonstrating, providing training on proper understanding and development of skill in the use of PPE, including supplying (i) best quality safety jacket, (ii) suitable hand protection gloves, (iii) appropriate foot protection shoes, (iv) best quality safety helmets, face shields, ear muffs etc. (v) suitable eye protection goggles	LS	LS @ Tk 30,000	30,000
8.	**Tree plantation** Tree plantation to compensate the felled down trees and enhance the ecological condition in the subproject area- preferably local fruits, flowers, medicinal and ornamental trees- Mango, Jackfruit,	200 nos.	@ Tk. 1000	200,000

	Jam, Kathbadam, Chalta, Krisnachura, Bokul, Jarul, Polash, Kadom, Shimul, Neem, Arjun, Amloki, Horitoki, Bohera, Mahogany, Palm Tree, Chambal, Rain Tree, Shil koroi, Satim, Sishu (including protection, fencing and conservation during project defect liability period): Preferably at both sides of Road where space is available (fencing as per LGED rate schedule 5.26.14) (Contractors will also be instructed by the consultant and PIU prior to the tree plantation work) at an interval of 10 feet.			
9.	**Motivation training** Motivation training (twice: before and after construction start) of the Upazila Engineer 'sand Contractor's representatives on safety practice and as per direction of the E.I.C.	1 no.	LS @ Tk. 10,000	10,000
10.	**Waste disposal facility** Temporary camp site waste disposal facility improvement 2 nos. (1 no of organic waste and 1 no of inorganic waste disposal facility) and as per direction of E.I.C.	LS	@ Tk. 5000	5,000
11.	**Water Test (Drinking Water samples)** Water samples are to be collected periodically (half yearly) from the tube well at labor shed area for laboratory analysis of different parameters such as pH, arsenic, iron, chloride, hardness, total dissolved solids, nitrate, nitrite, coliform, electrical conductivity etc. all complete as per direction of E.I.C. (including the cost of actual fees for testing from reputed laboratory and report) as desired by E.I.C.	LS	@ Tk. 5000	5,000
12.	**Working labour shed:** Construction of Labor shed (Size: 30'x20') with C.I sheet Roofing, Tarza fencing and brick soling floor as per requirement and direction of the E-I-C.	1 no.	LS @ Tk. 30,000	30,000
13.	**Environmental management** Environmental management costs of the Environment & Social/ Safeguard Personnel for Environmental and Social Management and Monitoring during construction and operation phase for their salary & transport (Net payment excluding Tax &VAT). And as per direction of the E.I.C. **(One Safeguard Personnel for R3, R5, R7, R11 & R14)**	1 person	Monthly basis @Tk. 35,000.00 for 12 months. One person covering 5 roads i.e.35,000Tk.*12months*(1/5 one road).	84,000.00

	Subtotal Bill: Environmental facilities	**762,563.16**

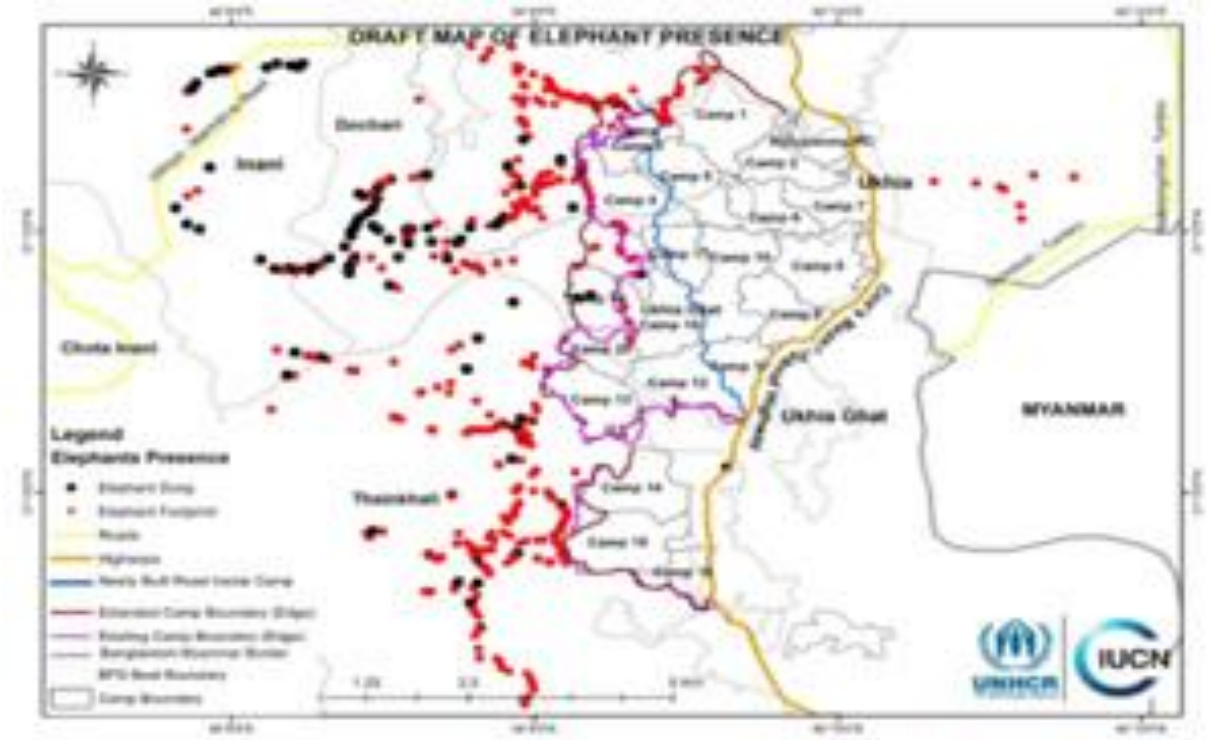
Cost of H&S Measures under COVID 19 Situations for W23-11

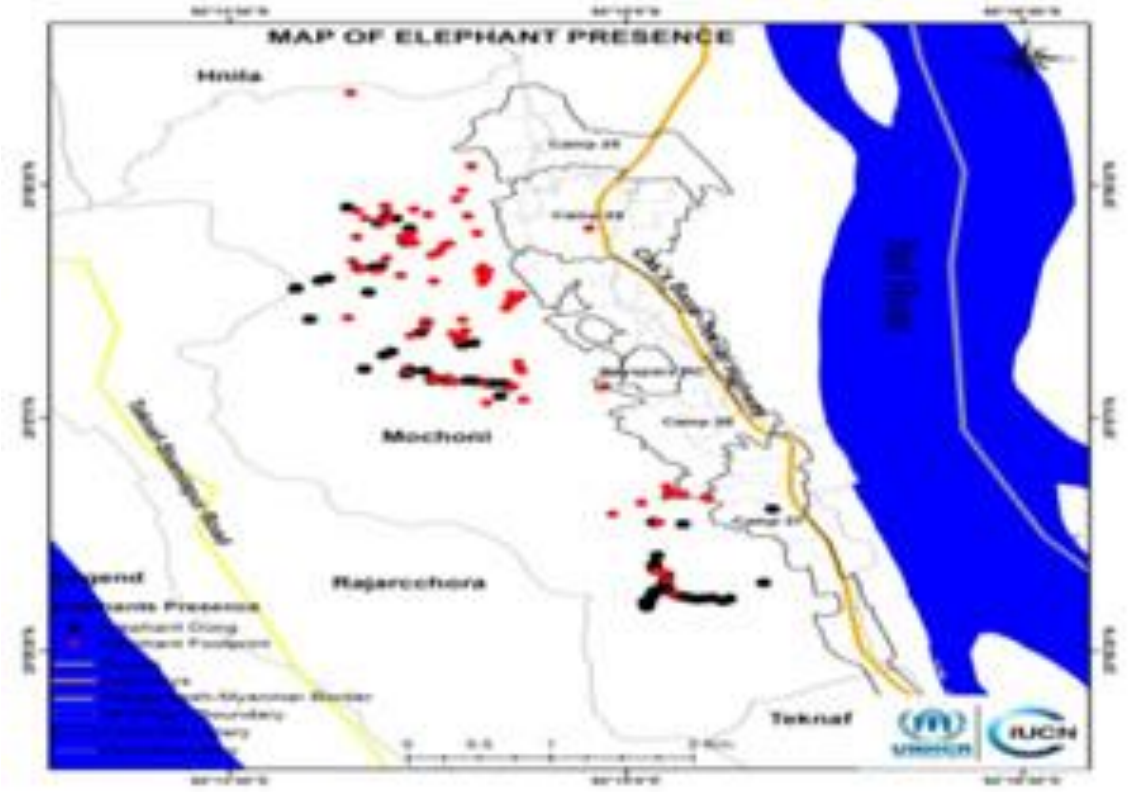
Considering the emerged situation, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites. The cost is estimated counting 50 workers for 270 active working days (9 months in a year) in a contract period for one site under this package (EMCRP/W-23.11).

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
1.	Non-Contact IR Digital Thermometer	01 nos. in each site	N/A	N/A	5,000.00	1	5,000.00	Each site office will have a thermometer for checking body temperature every morning at the entrance of the working site
2.	Wash Basin with Small Water Tank, Bucket and Mug (or piped water supply)	01 nos. in each site	N/A	01 nos. in each camp	10,000.00	2	20,000.00	Wash basin to be installed at favorable locations immediately after the entrance to the facility
3.	Trash bin (covered)/Paddle Bin	01 nos. in each site	N/A	01 nos. in each camp	550.00	2	1,100.00	
4.	Bar Soaps (150 gm each)	135		169	50.00	304	15,200	To be placed in a case/holder on the basin, for washing hands for max. 35 people a day and showering of 30 workers in each labor camp.
5.	Hand Sanitizer (2 nos. 250 ml bottle and 5 liter Can for Refill)	2 bottles and 1 Can for each site	N/A	N/A	4,000.00	1	4,000.00	2 bottles and a 5 litre can for each Site office

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
6.	Face Shield/ Protective Safety Goggles	30 nos. for each site		N/A	400.00	30	12,000.00	For labors who work in close contact, 30 in each site
7.	One time Mask (Disposable) for Contractors' Staffs	5 nos. each day in each site		N/A	12.00	1350	16,200.00	Reusing N95/KN95 mask will not be a manageable option in field scenario, one time disposable medical/surgery mask a good option instead.
8.	Cloth mask for Workers	N/A	50 nos. for each labor camp		35.00	900	31,500.00	A worker will use a mask for 15 days with everyday washing
9.	Floor Cleaner (1 litre Can)	3 Can	N/A	6 Can	250.00	9	2,250.00	
10.	Detergent Cleaner	N/A	2.5 kg in each camp/month		400.00	22.5	9,000.00	To be used for washing clothes, masks and tools & equipment, etc.
11.	Miscellaneous cost				20,000.00	1	20,000.00	Contingency cost for medical emergency and compensation for workers, subject to proper documentation
	Grand Total						**136,250.00**	

Appendix-4: Elephant Migration Routes Map





Elephant presence map (latest information published by on 24 May 2018)

Appendix-5: Location Map of Sub-project component

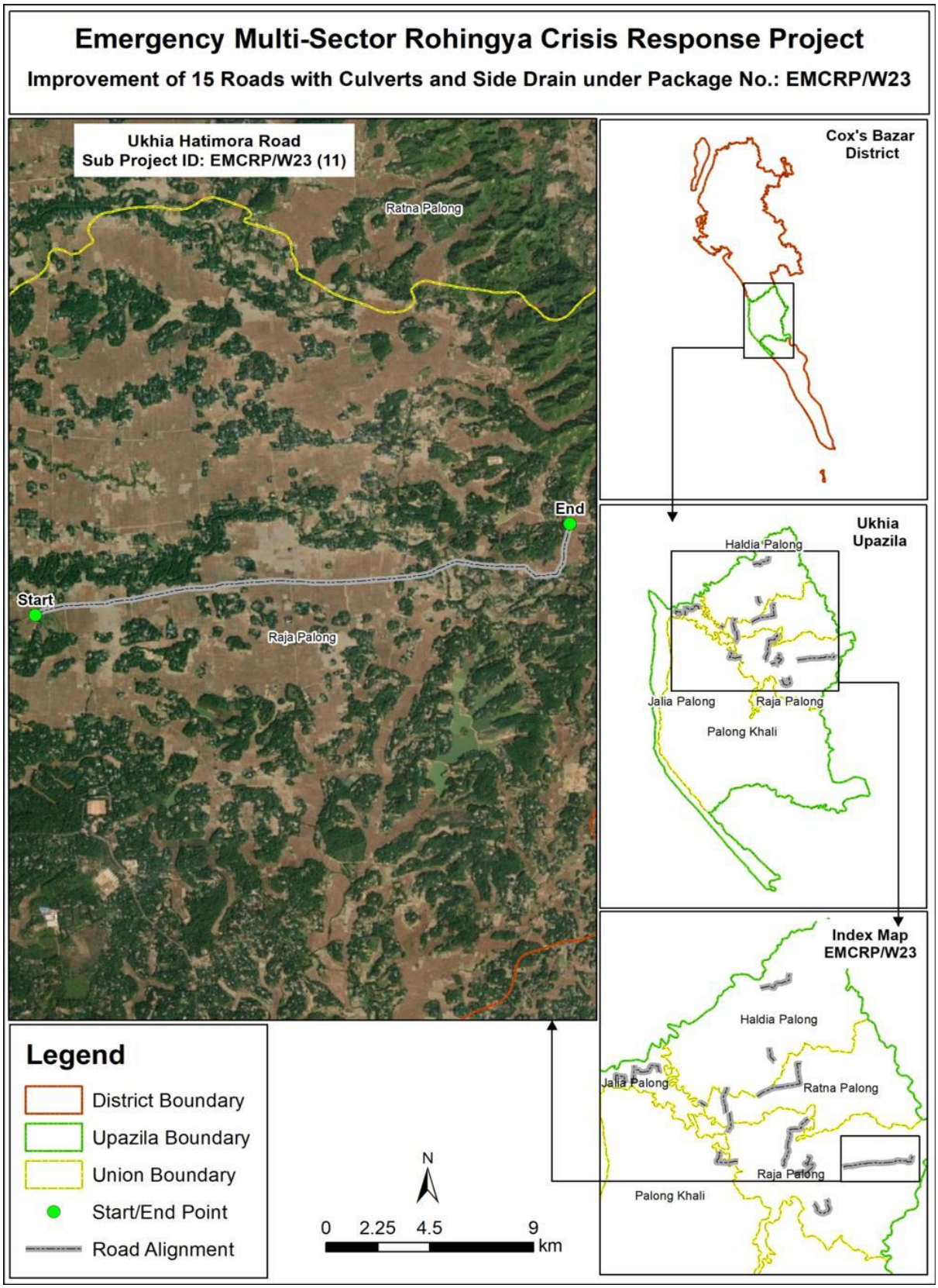
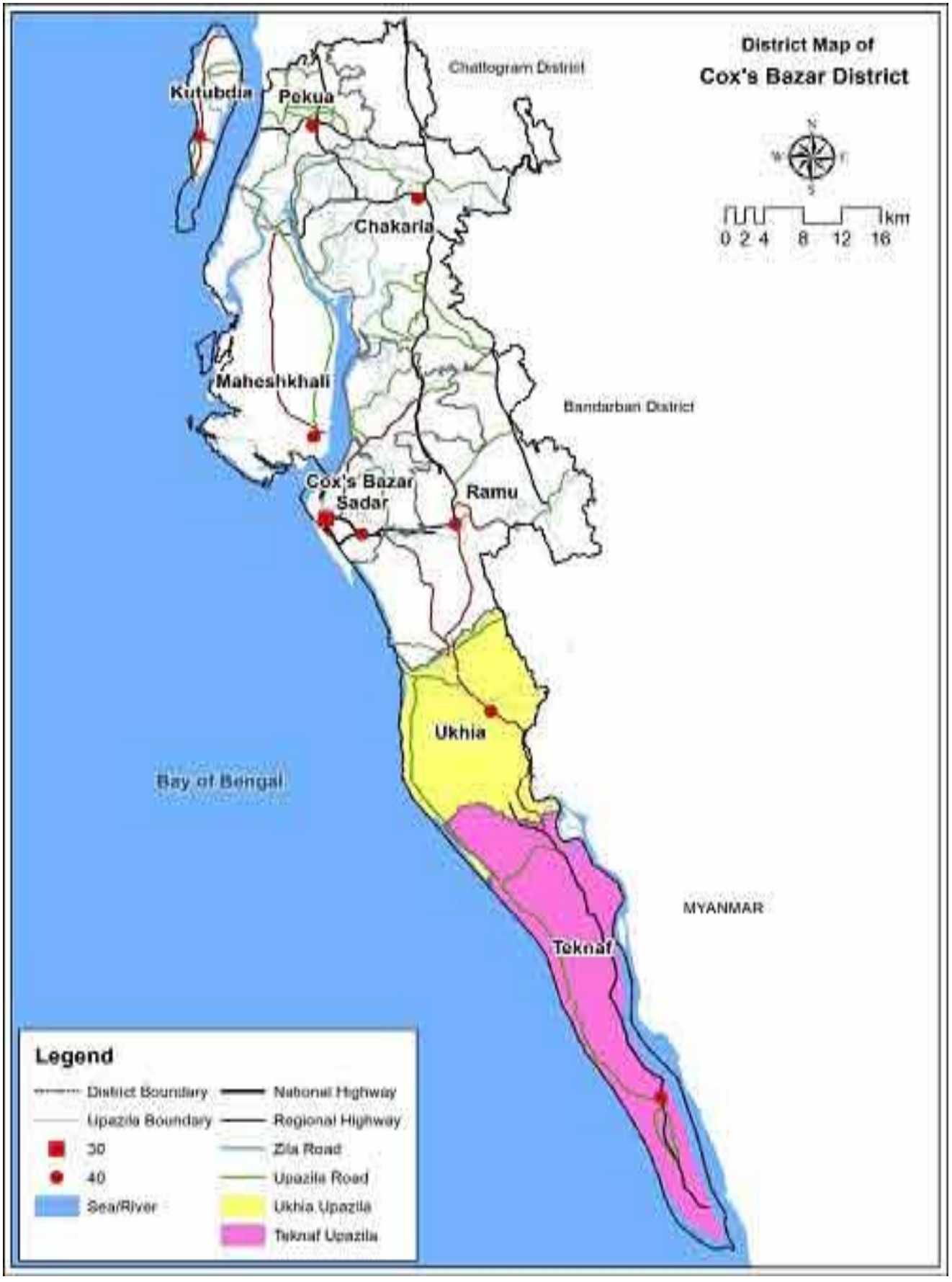
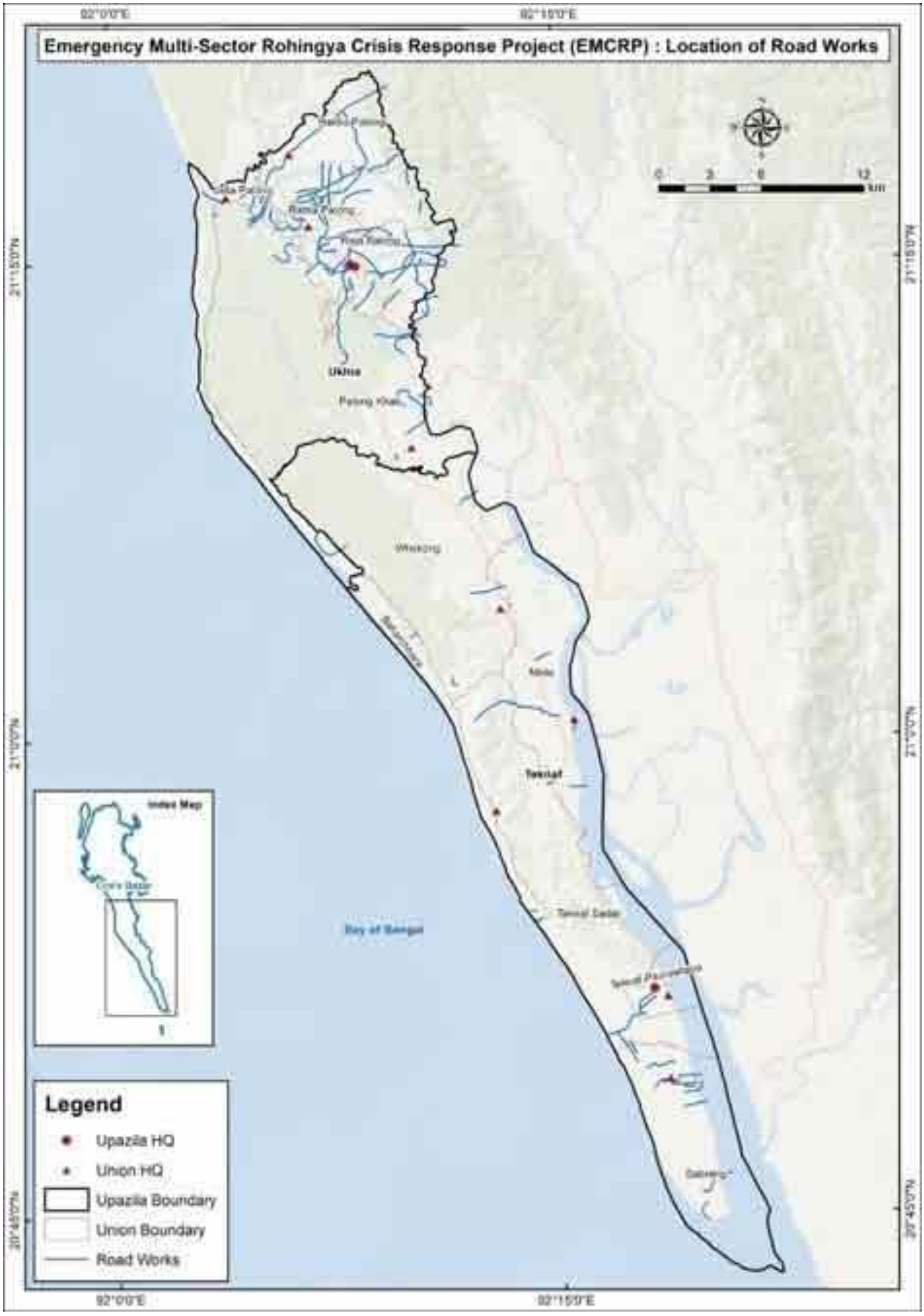


Figure: Location Map of W23-11


District Map of
Cox's Bazar District
Chattogram District
Kutubdia
Pekua
Chakaria
Maheshkhali
Bandarban District
Cox's Bazar Sadar
Ramu
Ukhia
Bay of Bengal
MYANMAR
Teknaf
0 2 4 8 12 16 km
Legend
District Boundary
Upazila Boundary
30
40
Sea/River
National Highway
Regional Highway
Zila Road
Upazila Road
Ukhia Upazila
Teknaf Upazila

District map showing Ukhiya and Teknaf Upazila



Upazila map locating proposed roads

GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH
Ministry of Local Government, Rural Development and Co-operatives
Local Government Division
Local Government Engineering Department

Emergency Multi Sector Rohingya Crisis Response Project (EMCRP)

Project ID: P167762 **IDA Credit No. 5561-BD**





Environmental Screening Report

For Shiler Chara Road Id: 422945074 with culverts and side drain under Cox's Bazar District.

Under the package no. EMCRP/W23

Funded by:

THE WORLD BANK
IBRD • IDA

Government of the People's Republic of Bangladesh & World Bank

Design and Supervision Consultancy:

Development Design Consultants Ltd.

October-2020

Contents

1. INTRODUCTION 1

1.1 Project background 1

1.2 Elementary information of Work Package Component of W23.9 2

1.3 Proposed intervention items for this component 4

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS 4

2.1 Methodology 4

2.2 Important features/establishments within the PIA 5

2.3 Issues and Recommendations raised by the Participants in regards to component interventions for W23.9 6

3. ENVIRONMENTAL SCREENING 7

3.1 General 7

3.2 Major Findings 8

3.3 Climate Change Impact Screening 10

3.3.1 General Overview of the area 10

3.3.2 Site Specific Screening and outcome 11

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) 12

4.1 General 12

4.2 Health and Safety Measure under COVID Situation 14

4.3 Cost of Environmental Enhancement Works in BOQ 15

5. LIMITATION OF THIS STUDY 15

6. CONCLUSION AND RECOMMENDATIONS 15

Annexure-01: Important Environmental Features (IEFs) near site 17

Annexure-02: Attendance of consultation meetings for W23/9 18

Annexure-03: Pictures of sub-project component location and surrounding features with public consultation 20

Appendix-1: Environmental Screening Form for examining sub-project component 21

Appendix-2: Environmental and Social Management Plan (ESMP) 39

Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.9 47

Appendix-4: Elephant Migration Routes Map 52

Appendix-5: Location Map of Sub-project component 53

ACRONYMS

BOQ	Bill of Quantities
BFS	Brick Flat Soiling
D&SC	Design and Supervision Consultant
DoE	Department of Environment
DRP	Displaced Rohingya people
EA	Environmental Assessment
EC	Electrical Conductivity
EMCRP	Emergency Multi-Sector Rohingya Crisis Response Project
ESMP	Environmental and Social Management Plan
ERP	Emergency Response Plan
ESMF	Environmental and Social Management Framework
FDMN	Forcibly Displaced Myanmar National
FGD	Focus Group Discussion
FSM	Faecal Sludge Management
GBV	Gender Based violence
GPS	Government Primary School
GRM	Grievance Redress Mechanism
HBB	Herring Bone Bond
IEFs	Important Environmental Features
ISCG	Inter Sector Coordination Group
IUCN	International Union for Conservation of Nature
IWM	Institute of Water Modeling
LGED	Local Government Engineering Department
PIA	Project Influence Area
PIU	Project Implementation Unit
PMU	Project Management Unit
PPE	Personal Protective Equipment
PSC	Project Steering Committee
SMC	School Management Committee
SPM	Suspended Particulate Matter
SWM	Solid Waste Management
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
UNHCR	The United Nations High Commissioner for Refugees
VAT	Value-Added Tax
WB	World Band

1. INTRODUCTION

1.1 Project background

An estimated 730,000[1] people of Rohingya community has fled to neighboring Cox's Bazar district of Bangladesh since August 25, 2017 to escape extreme violence in Rakhine State of Myanmar, which caused the total number of Forcibly Displaced Myanmar National (FDMN) in the district to be about 923,033[2]. This huge number of displaced population account for about one-third of the total population of Cox's bazar, a district which was already facing many development challenges and suffering from resource-constrained social service delivery system even before the crisis evolved and the mass exodus of FDMN has worsened the situation further. Almost all of these displaced people are hosted in Ukhiya and Teknaf Upazila of Cox's Bazar, in extremely congested settlements in areas having very minimal access to basic infrastructure and services and is prone to natural disasters. The Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP) has been designed in order to reduce the vulnerability of Forcibly Displaced Myanmar National (FDMN) along with people from the host communities in Teknaf and Ukhiya Upazila under Cox's Bazar District, to different disasters and improve the social service delivery system and disaster resilience to both the communities. This project will follow a sustainable development pathway that is resilient to disaster and climate change effects.

The objective of the Project is to provide greater protection for the FDMN and host communities through:

- Reducing the vulnerability to natural disasters
- Improving social service delivery system and providing better communication facility through physical interventions
- Improving water and sanitation facilities
- Reducing vulnerability to accidental fire
- Provisioning better educational facilities and
- Strengthening and scaling up of GBV prevention services to the FDMN

The project is jointly being implemented by Local Government Engineering Department (LGED), Department of Public Health Engineering (DPHE) and Ministry of Disaster Management and Relief (MoDMR) under their respective mandate and scope of works. Apart from the interventions in Addressing Gender and Social Inclusiveness and Preventing Gender Based Violence with the Support from UNFPA and building Communication and Awareness among all affected parties through an effective engagement of BCCP (Bangladesh Center for Communication Programs) in the areas, LGED is implementing a good number of infrastructural facilities, namely improvement of hat bazars, roads (both inside and outside of the camps), bridges, culverts, construction of School cum multi-purpose disaster shelters, Satellite Fire Stations, Relief Distribution Center, Community Service Center and many other different types of facilities. Given the project interventions, sensitivity of the areas and volume of people in or around the sites, the project is more likely to trigger certain Operational Policies and Bank Procedures, namely Environmental Assessment (OP/BP 4.01), Natural Habitat (OP/BP 4.04), Forest (OP/BP 4.36) and Physical Cultural Resources (OP /BP 4.11).

[1] ISCG: Situation Report Rohingya Refugee Crisis, (September 27, 2018)

[2] IOM Needs and Population Monitoring round 12 as of October 10, 2018

1.2 Elementary information of Work Package Component of W23.12

It is imperative to recognize proposed components under Work Package-23.12 in Ukhiya Upazila in order to assess and verify its interventions according to stipulated screening requisites from WB. Acknowledging this matter, such details are accounted for as given below in Table 1.2.1 along with visual presentation (General Upazila Map) given in Figure 1.2.1. Aerial map for this component is given in Appendix -5.

Table 0-1.2.1: Basic Featured Information of components [Sources of data: Field survey, 2020: DDC & LGED]

Component's name under W-23	GPS Coordinates	Distance from Upazila HQ	Union	Ward	Project Influence areas locations	Pre-existing condition of Road	Proposed Road type	Road dimension(m) (Length X Width) = Footprint (sq.m) *
Shiler Chara Road Id:422945074	**Starting Point** 21.23618^0 N 92.14223^0 E **Ending Point** 21.23786^0 N 92.14738^0 E	3km	Rajapalong	6	Faliapara, Md. Ali Vita, Mohoripara	Partly HBB(Broken), Partly BFS	Bituminous Carpeting (BC)	(1517mX 4.9m) = 620,453 sq. m

*Note: Roads are proposed to have average carriage way of 3.7m with 0.6m shoulder on each side; special conditions may prompt further adjustments while in construction period. However, footprint for roads is calculated with an average of 4.9 meters.

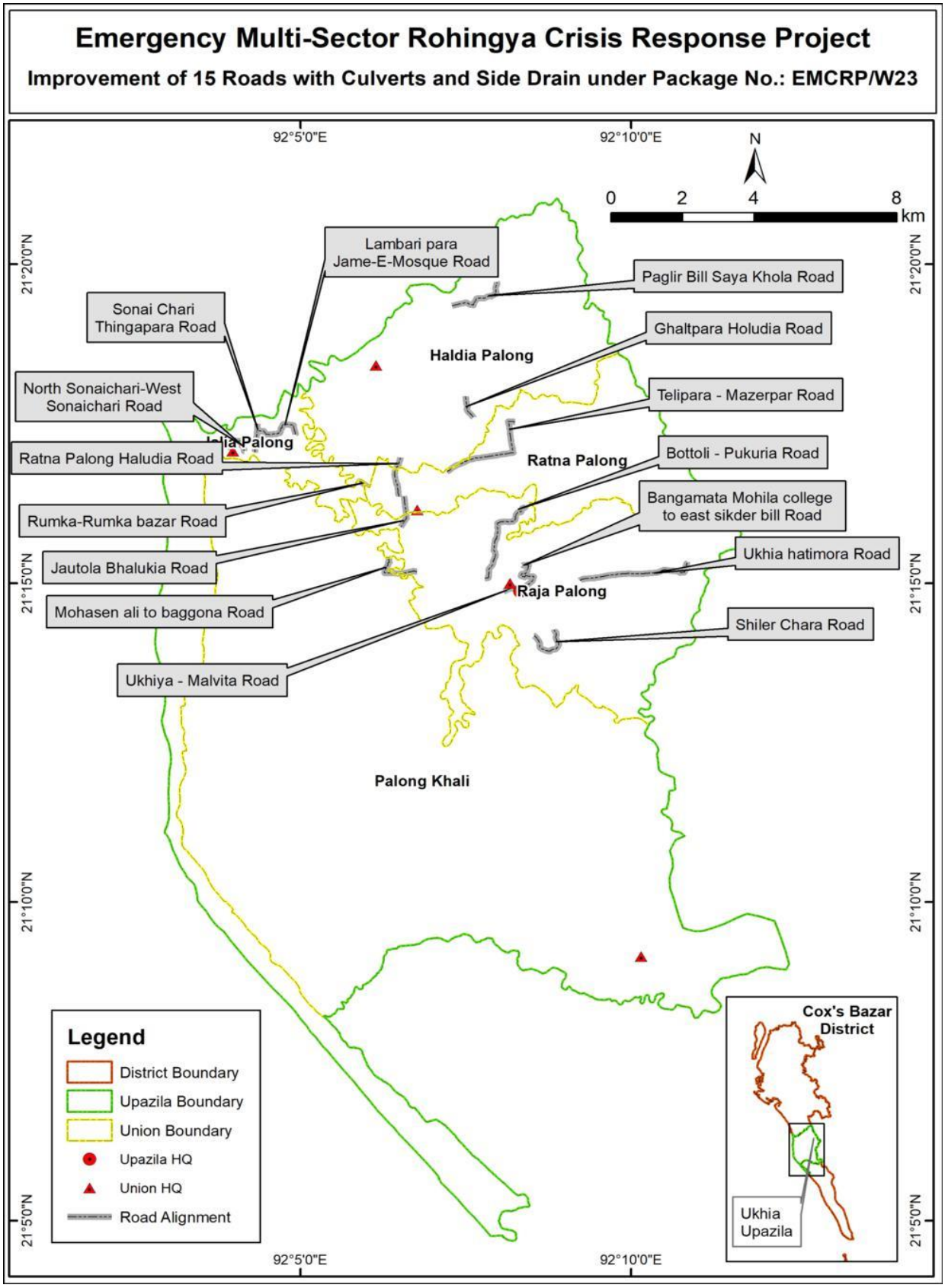


Figure 1.2.1: Map illustrating Shiler Chara Road Id: 422945074 location in the Ukhiya Upazila

1.3 Proposed intervention items for this component

The Shiler Chara Road Id:422945074 (W23/12) under work package W23 have been proposed with specific need basis dimensions to accommodate and ensure best quality interventions for local stakeholders. In context of governing environmental circumstances and geo-meteorological conditions, protection work items have been added to construction design for safety and sustainability of each proposed roads. These roads are abutting agriculture hence, construction and improvement works will descent these roads into new circumstances in some parts. These items have been included on the basis of field survey and analysis of these conditions. Please follow the table to acknowledge these items.

Table 1.3.1: Proposed safety interventions of component

W23-12: Shiler Chara Road Id:422945074
01 nos. Cross Drain (dimension: 0.975mX 0.975m) at Ch. 1455 and **06 nos. Cross Drain** (dimension: 0.750mX 0.750m) at Ch. 352m, Ch. 483m, Ch.455m, Ch. 524m, Ch. 871m, Ch. 1143m and **397.0m RCC U-Drain** (.600mX.600m), **214.0m RCC U-Drain** (.750mX.750m), **315.0m L-Drain** at different chainage, and **118.0m Toe wall**(1.5 height) and **541m RCC Palisading (brick) work**, **31.0m Toe wall**(2.0 and 2.5 height)and **RCC Retaining wall** (54m X 3.0m). **Road safety** work and **Environmental Mitigation and Enhancement** works are also included. Description of safety works and environmental enhancement works can be found in BOQ attached in Appendix-03.

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS

2.1 Methodology

Public participation and community consultation have been taken up as an integral part of environmental assessment process of the project. As part of the impact assessment, participatory public consultation was conducted in areas of concern for proposed roads by the field level staffs and consultants from PIU and D&SC. The consultation meeting was attended by disparate social groups representing local habitants, separate age groups, social class and occupations. In some cases, IUCN employees in charge of elephant watch tower were present where frequent elephant movements occur. The participants were also selected from different segments of stakeholders, and some of whom will have major active roles before, during and even after the construction works. Therefore, the meeting was organized in an informed, expressive and unbiased manner, wherefrom different views and concerns came across which will be properly taken care of during the design and construction phases. In order to serve our screening process, relevant items were thrown towards the audience to discuss and troubleshoot confusing or worrying matters regarding the proposed intervention under package work. Impacts in regards to environment, socio-economic matters during pre-construction, construction and post construction phase have been put forth. Possible mitigation measures and relevant needs have turned out during these sessions as well. Moreover, their comprehension as a stakeholder has been up lifted in light of project guidelines.

However, public consultation is a living process as the types of problems/ difficulties, involved parties or stakeholders and mode of settlement or resolution processes are more likely to differ with time. Thus, consultation with different parties or stakeholders will be continued throughout the sub-project implementation period and records of resolutions, whatsoever and wherever possible, will be kept in writing at the site and made available on any enquiries or requests by all parties concerned.

Most of the possible impacts under this component development have been put through review for locating impediments or possible adversity effecting future environment and socio-economic conditions. In order to comprehend surrounding features and impacts which may stipulate with it, screening has acknowledged having a Project Influence Area (PIA) of 0.5-kilometer radius. Sensitive findings have been identified if any, and relevant mitigation or minimization measures were suggested to subdue such complication for over the project construciton period. Moreover, evaluation was inspired to enhance environmental features and include monitoring initiatives under ESMP budget to ensure exertion of environmental improvement propositions. Contractor's responsibility has been taken into account while identifying possible impacts through sets of intervention accounts. These steps have been initiated strictly following ESMF guidelines and requirements. Environmental screening procedure was motivated by ingredients highlighted in Appendix-2 of ESMF. During survey, detail chainage length of the sub-projects was taken into account for detailing environmental and socio-cultural features within 100 meters buffer zone of both Left and Right side from the center line of the road. Longitudinal intervals of 300 meters have helped to identify positions of sensitive or near-sensitive socio-cutural features. These findings are illustrated in **Annexure-01**.

2.2 Important features/establishments within the PIA

Initial screening process is conducted through direct involvement of PIU and D&SC in the influence area of the proposed component, which allows to raise significant questions and ideas towards participants. In combination of both field walk-through and inputs of audience, a register of existing features is formed. Allow the following table to describe such elements in all the work package components.

Table 2.2.1: Important features within Project Influence Area for W23.12

Component's name under W-23	Direction	Important features/ establishment (approx. distance from the proposed site)
Shiler Chara Road Id:422945074	North	Technical College (900m), Households (50m)
	South	East Foliapara Mosque(50m), Ad Ali Vita Mosque/Madrassa/Hefzokhana(200m), Makaria beel (800m), Maskaria School(500m)
	East	Moulovipara Mosque (500m), Shoilerchora Buddhist Mondir (500m)
	West	Foliapara Mosque/Hefzokhana/Madrassa (300m), Md. Ali Vita Buddhist Mondir(300m)

2.3 Issues and Recommendations raised by the Participants

After inauguration has set in motion, their valuable opinions and remarks came pouring out. At this point, we find our field base knowledge for assessment attributed impact degrees and possibilities. Please follow the table 2.3.1 given below to recognize participants' inputs arranged in relevance with this component. Consultation meeting summary, attendance sheets and pictures of separate meetings with proposed location for this subproject component can be found in Table 2.3.2 and Annexure-02 and Annexure-03 respectively.

Table 2.3.1: Issues and Recommendations raised by the Participants

COMPONENT'S NAME UNDER W-23.12	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
SHILER CHARA ROAD ID:422945074	• In Faliapara, Md. Ali Vita and Mohoripara area, this proposed road is previously HBB developed but current condition is broken in most part. They feel this improvement with BC is highly needed for them to ensure quality road for better communication facility. • Big vehicles cannot use this road due to having short crest. In some occasions, big vehicles move over towards open fields adjacent of this road in order to pass through •Possible dust and noise pollution during the construction works. •Safety of children and adults at the sites during construction works. •Elephant movement not present. •Local community wish to have a better drainage system along with the road in order to allow waters from higher grounds to find an uninterrupted pathway not causing harm to nearby households or agriculture fields and wash away top soil of adjacent grounds residing alongside the road. It will protect the top soil for future growth of crops and aid vegetable farming or homestead gardens. Abutting the road, the chainage consists of homestead gardens. These features should not be disturbed in construction period. •The participants have expressed	• Local people considered that the selected site is suitable for the construction of this road from both the technical and social-environmental (Direct savings in the cost of operating vehicles, time savings by travelers and freight, wider effects can less accident rates, this road is waterproof and also dust free, much more durable) point of view. It will provide better mobility and access to services in due time. •The road should consider water flow during rainy seasons thereby ensuring the construction is not affected by mass water flow. •Enough pathway is expected for vehicle movement so that comfort travel is achieved. •Construction site safety should be ensured to avoid any mishaps or accidents during work periods. •They considered small lumbering and suggested tree plantation initiatives. •They also requested to involve the local community to construction work and they will welcome any outside key labor. •During construction period, alternate route to pass through this area is available. •Since the road is passing alongside homestead gardens and agriculture fields, the intervention will invite air pollution on moderate level during construction period. However, preventive actions and measures can be taken to keep air quality from degrading. • Women should be recruited equally, wherever possible. •Participants, made certain that they will provide surveillance over raw materials and material storage area. •They have also ascertained that the selected site is

COMPONENT'S NAME UNDER W-23.12	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
	their greater interest for this intervention and believes this will bring nothing but prosperity for the entire catchment dwellers. •Household fences along the road should not be affected while construction • No trees should be harmed for preparation of this road • Available pathway to usher material delivering vehicles • Labor shed availability in the target location. • Material storage is available.	free from any events related to resettlement and major environmental impacts. The adverse environmental impacts that may come in the way of air quality, noise, solid waste, occupational health & safety during the construction period, and will be of short duration, yet proper management/conservative options should be adopted. • Open spaces are available along the road which can be used for material storage and labor camp. • East Foliapara road is available for material delivery. • Electricity is available and contractor can install tube wells as deemed necessary.

Table 2.3.2: Consultation Meetings Summary

Road Package Number	Date DD-MM-YYYY	Venue	Main Participant Groups	No. of Participants	Remarks (If any)
W23-12	08-10-2020	Abdullah Store, Sheilerchora	Host Community	21	-

3. ENVIRONMENTAL SCREENING

3.1 General

This section identifies the potential impacts that the various elements of the proposed Project may have on the physical, biological and socio-economic environment within half a kilometer of the radial distance around the site. Environmental Assessment (EA) based on this screening study for the Sub-project has been conducted to identify and determine which potential Project impacts may be significant and therefore require the application of reasonable and effective management and/or mitigation measures.

In order to realize the exact physical, biological, socio-economic and environmental impacts of the proposed sub-project sites and the influence area in regards to the implementation measures, an extensive field visit was carried out in each proposed sub-project PIA. Environmental Screening form, as adopted in **Appendix 2** of the Environmental and Social Management Framework of EMCRP, was administered for identifying the impacts and their extents.

The screening data and information for this subproject component and details screening summary have been formulated and shown in **Appendix-01.**

3.2 Major Findings

A complete view of current environmental conditions of individual sub-projects in relation to interested queries has been congregated in order to understand the degree of impacts corresponding with marked interventions. Interestingly, most sub-project has correspondence with its surrounding features and upholds interchangeable impacts. However, the degree is not an interchangeable factor since scale is not parallel to each of these components which is where, mitigation measure differentiation is implied. There are some cases where unique circumstances have been met with while environmental screening took place which is also accounted for and should be a matter of concern for other parts of the ESMF initiative. The significant issues observed for this subproject component is enlisted in following Table 3.2.1 with pertaining impacts. Moreover, impacts that are adventitious has also been embraced for promoting best practices.

Table 3.2.1: Concerning environmental issues relating to each proposed subproject and influence area for W23.12

COMPONENT'S NAME UNDER W-23.12	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
SHILER CHARA ROAD ID:422945074	It is not located within any major environmentally sensitive area.	It will not cause any severe negative effects to the environmental settings of the area neither to important environmental features.
	Construction period will induce air pollution while preparing for bitumen and loading-unloading raw materials. Impacts on air quality during the construction phase may turn to negative. The main impacts include dust generation from crushers, vehicles and the transportation of all types of construction materials.	It will invite waste production which may in turn cause minor air pollution due to deposited dust and airborne particles less than PM_{10}. Dust pollution may slightly suffocate photosynthesis however this can be minimized through regular water sprinkling as suggested in ESMP.
	Noise emission from construction machineries and equipment can cause nuisance to local residents and workers.	The ambient noise level might have potential to increase temporarily and intermittently in the close vicinity of active construction fronts.
	No agriculture, fish farming and significant vegetation coverage is located in the ROW nor does it stand over such items. Nonetheless agriculture fields and homestead gardens/forest are found beside the road.	No agriculture land or any forest coverage will get degraded or lost for construction. Liquid waste such as left-over oils or chemicals might run into these adjacent features.
	Construction works will involve chemical usage and preparation of on-site add-ons to the road. Generating scraps and residues.	The runoff from work site may enter existing pond and frustrate the water quality which will be acute however.
	Few amounts of bush (sapling) will be cut down during construction phase at different chainage.	No severe damage will occur or damage to habitat will be faced. It can be managed by introducing small plantation incentives around the proposed location.
	Elephant Movement is not present in the vicinity of the subproject location.	No impact is expected
	No heavy earth excavation work will be involved.	Consequently air, noise and dust pollution will

COMPONENT'S NAME UNDER W-23.12	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
		be occurred within a small-scale during construction period only.
	Construction related activities and setting up of labor camps along with associated facilities and their management can cause adverse impacts.	Noise pollution from pilling or drilling, air pollution caused by dust or gaseous emissions from vehicle movement, running of motorized equipment and land clearing, odors and soil pollution from leaking of latrines and fecal sludge, will more likely to take place.
	Chemical spills or improper disposal of construction waste materials due to lack of worker training and misconduct of contractor's safety initiatives.	During the construction period, soil may get contaminated from activities such as handling of hazardous construction materials (such as fuel, lubricants, paints, and solid waste and sewage).
	Vibration effects generated from pilling, drilling or other construction works	Any vibration would result in nuisance effects to nearby faunal species, and but will be localized and temporary and will unlikely to result in structural damages to buildings or walls of the adjacent private properties.
	Sensitive environmental, cultural, archaeological, religious sites within 1 kilometer of site includes including Technical College (900m), Households (50m) to the North. East Foliapara Mosque(50m), Ad Ali Vita Mosque/Madrassa/Hefzokhana(200m), Makaria beel (800m), Maskaria School(500m) to the south. Moulovipara Mosque (500m), Shoilerchora Buddhist Mondir (500m) to the east and Foliapara Mosque/Hefzokhana/Madrassa (300m), Md. Ali Vita Buddhist Mondir(300m) to the west.	No disturbance to all these establishments/features is anticipated due to construction activities for the sufficient distance from the construction site, and strict construction site management system-including restrictive work schedule during the daytime only, water-sprinkling twice a day on and around the site, safe storage of materials, etc.

A few incidents of human elephant conflict have been reported in 2018. The IUCN has conducted a study on such conflict. With the support from UNHCR, IUCN has been marking elephant routs and corridors and informing local communities and stakeholders of avoiding the marked areas. As part of the mitigation options, different initiatives have been undertaken, such as formation and capacity development of Elephant Response Teams (ERTs); providing equipment to ERTs to divert in-coming elephants; and setting up elephant deterrent tools (e.g. trip alarms and watch-towers). Though the current chances of occurrence of conflicting incidence are zero, any recurrence would be managed by the ERTs and they will be called if there appears any minute possibility to recur. A map of elephant movement is given in Annexure 04.

In order to offset the loss or attenuating the environmental degradation, a set of mitigation measures will be adopted, on top of general practice of standard construction procedure or following the relevant codes of practices.

3.3 Climate Change Impact Screening

3.3.1 General Overview of the area

Cox's Bazar is one of the coastal districts of Bangladesh and is prone to the effects of climate change due to its geomorphological siting and climate induced effects. The hilly tracts of Cox's Bazar could foster further environmental crisis brought on by indiscriminate deforestation and diminishing groundwater reservoirs, which have been taken place in recent months as the Rohingya crisis evolved. A recent study conducted by World Bank[3] has found that Cox's Bazar will be the worst-hit district in South Asia as average temperatures rise and rainfall patterns become disruptive, by 2050, if greenhouse gas emissions continue unabated.

The hilly region of the country, especially the part in Cox's Bazar is characteristically of muddy soil structure, not of any rocky formation and the stability comes from the roots of the trees. Also rainfall, proximity to the sea, elevation, and land cover are very important factors for analyzing the risk of cyclone. Denudation of trees from hilltops in order for the huge settlement of Rohingya people has already increased the vulnerability to the risk of hill collapse by destabilizing the terrain. Also deforestation at a rapid speed uncovers the land and raise the risk of occurrence of cyclones, as forests protect land from high wind and storm surges where demolishing the trees would make the area vulnerable.

Together with the above-mentioned hazardous situation, again due to sudden extraction of huge amount of groundwater, availability of potable water from shallow tube wells that pump water up from about 150 feet has already reached to a critical level. Averting the problem requires new tube wells to be plumbing deeper into the poorly mapped aquifer, but going deeper than 700 feet in some places may cause salt water to contaminate freshwater resources.

In this case, it is possible that a stationary position of the freshwater-saltwater transition zone can be established via proper management of pumping in the confined aquifer.

The groundwater resource is seen to suffer more from the climate change impact. The impact on groundwater due to climate change impact include

- Sea-level rise could result in a transgression of the sea and a loss of land area. This could also lead to the secondary effect of population migration in the new coastal band due to migration of the coastal population from the encroaching sea, thereby increasing domestic water needs in the new coastal area.

- Transgression of the coast implies that saline storm surges of 1 or more meters depth would penetrate beyond the new coast to new land areas. Storm surges transport saline water far inland of the coast and much of this floodwater may infiltrate the ground in areas where the aquifer is not fully saturated. Even where the aquifer is saturated, denser saline water may

[3] https://openknowledge.worldbank.org/bitstream/handle/10986/28723/9781464811555.pdf

sink into the aquifer during the flood and later from pools of saltwater that remain following the flood[4].

- It has been identified that the salinity is found in the shallow aquifers along the coastline. So the salinity which are found in the groundwater are of lesser concern as salinity will subside over time

- Several researches show that through modeling of groundwater flow that the depletion of groundwater in the host community will persist up until 2022 and the replenishment of water will take place.

Considering the general climate change effects in Cox's Bazar area and offsetting the aggravating environmental situation due to the mass arrival of Rohingya communities, several specific measures including tree planation in sub-project areas, rainwater harvesting from every disaster shelter, construction of drainage facilities along the road length and installing thunder arrester across the areas, have been suggested and will be implemented.

3.3.2 Site Specific Screening and outcome

Climate Change impact on a particular subproject is tough to deduce as the highest resolution of climate model simulation done over Bangladesh is 50km. Depending on the simulation ensemble of Cox's Bazar district, the temperature and precipitation are likely to increase with time.

Site specific climate change impacts are often not so easy to measure or deduce plausibly while the site is confined to a narrow strip of roadways, and associated mitigation or offsetting measures are really hard to plot on the impact areas, though an overall set of measures are often considered in practical aspect. Fig:1 shows the inundation risk map of the subprojects under W-23, none of the subprojects are in vicinity of the severe river flood inundation area. So the risk of flooding is low around the sub-project area

[4] "Implications of Climate Change for Fresh Groundwater Resources in Coastal Aquifers in Bangladesh", World Bank report.2010

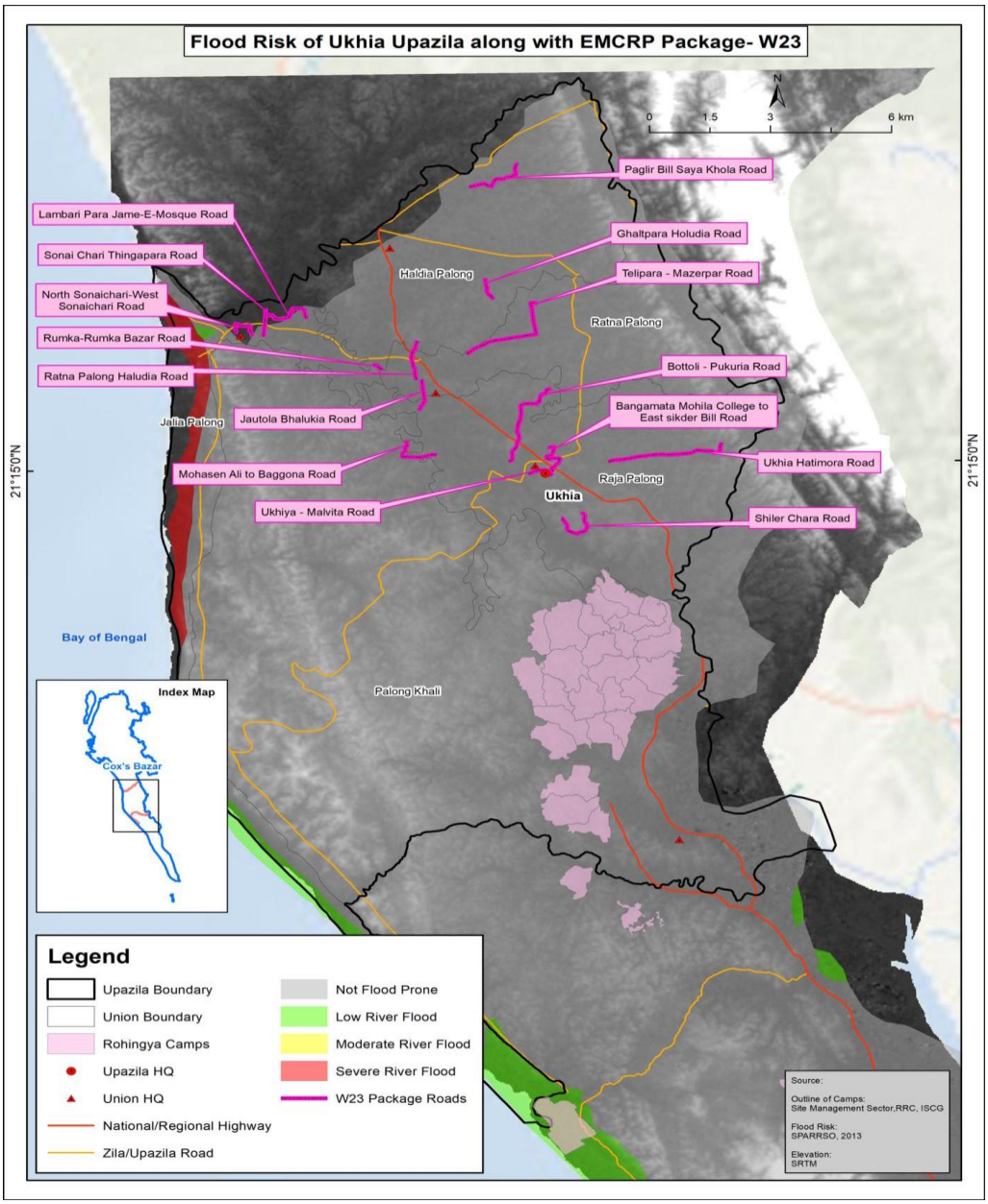


Figure 3.3.2.1: Flood inundation risk map near the subprojects.

Also, in order to avoid the devastation caused by the thunderstorm, state-of the-art thunder arrester (lightning protection system) has been suggested to install having a coverage area of 25,434 sq.m for a single arrester. In addition, tree planation on the road slope/ within the premises is also suggested to sooth the temperature effect and increase the water retaining capacity of soil, at the same time.

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

4.1 General

Considering the environmental settings of the sub-project area, it can be assumed that possible impacts would be largely construction-related, and could be addressed through adoption of good engineering practices; good housekeeping; better *in-situ* construction materials management; and observance of health and safety protocols during the implementation period.

Table 4.1.1: Site Specific Impact and Mitigation Plan under package W23.12

Component's name under W-23.12	Impacts	Mitigation plan
Shiler Chara Road Id:422945074	To the south, East Foliapara Mosque (50m) is located. Moreover, there are settlements as shops and households are located adjacent to the sub-project which can be subject to air pollution. However, none are on the ROW.	Contractor must adhere to the best practice debris management procedure and regular adoption of dust control measures (spraying of water at least twice a day) to minimize the effect to the level best.
	Some part of the proposed road is passing by the agricultural land. **Box culvert** and **cross drain** will be constructed to terminate rainwater for one side to another side during rainy season and also help for rapidly remove excess soil water to reduce or eliminate waterlogging during monsoon and return soils to their natural field capacity and will help to maintain the water balance of both roadside agricultural land to provide a sustainable irrigated agricultural system. It will also help to prevent flood and not to allow water to overflow and also help to divert water for farming. Some high land is found beside the road. So, **L-Drain** will be constructed for drainage high land eel water during rainy season. **U-drain** is also considered for drainage facility that runs along the road for uninterrupted water flow. Some low land is found beside the proposed road so **protection wall** and **palisading work** will be constructed during construction period for used to "correct" the natural slope. There are points on the road where slope preparation cannot be done due to having low lying agriculture lands and water bodies. Slope preparation refers to resettlement issues as well in those locations. In such cases **Toe Wall** is proposed which helps to restrain the horizontal surface pressure. This is an adaptation technique and a precaution measure to not allow any damage to sideline existing low-lying features. There are low lands along the road where agriculture fields and ponds are present. This also excludes high chance of soil quality degradation. Some high land is found beside the road where **Retaining wall** will be constructed to avoid landslips and soil erosion.	**01 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 1455 and **06 nos. Cross Drain** (dimension: 0.750mX 0.750m) at Ch. 352m, Ch. 483m, Ch.455m, Ch. 524m, Ch. 871m, Ch. 1143m and **397.0m RCC U-Drain** (.600mX.600m), **214.0m RCC U-Drain** (.750mX.750m), **315.0m L-Drain** at different chainage, and **118.0m Toe wall**(1.5 height) and **541m RCC Palisading (brick) work**, **31.0m Toe wall**(2.0 and 2.5 height)and **RCC Retaining wall** (54m X 3.0m). **Road safety** work and **Environmental Mitigation and Enhancement** works are also included.

Further construction related activities which may result in adverse impacts in the surrounding environment of the sub project component must be kept under close consideration and appropriate mitigation and management measures will be taken with due care and vigilance. Once the effects are minimized to its least level and controlled efficiently, it will turn into a welcoming and beneficial project for the local communities. The component specific environmental management plans have been outlined in **Appendix-2**. The mitigation measures as well as monitoring program of ESMP have also been incorporated in the management plan.

Environmental quality enhancement: Under the additional financing to the EMCRP project, Forest Department of the Government of Bangladesh will afforest along 200 km of road length area, primarily under the Ukhiya and Teknaf Upazila of Cox's Bazar district in order to offset the environmental and ecological devastation, that had been occurred due to the evolution of Rohingya Crisis, to an achievable level. Many of these road lengths will go through and by the Rohingya Camps, up on the hill and are already denuded of trees or vegetation. Local Government Engineering Department (LGED) will allocate and channelize the finance to the Forest Department under the said additional financing component and oversee the progress of works with due diligence. However, this enhancement work will improve the environmental quality of the area and reinstate some parts of the ecosystem services to those areas, though primarily.

4.2 Health and Safety Measure under COVID Situation

Apart from the established Occupational Health and Safety (OHS) measures being followed in construction sites, offices, and labor camps, a set of additional measures has to be taken and practiced throughout the daily cycle by each labor, staff and any involved parties, due to the ongoing pandemic coronavirus situation. Staffs and consultants at PIU and D&S, along with the pool of consultants under different firms/agencies for different services, and all the representatives or staffs of construction contractors and suppliers have to play much sensitive, (pro-) active and responsible roles in abiding by the rules and measures by themselves and getting the involved workers and different stakeholders adhered to the same. A detailed guideline containing a set of measures with shared responsibilities has been sketched out in order to fight the exposure and further spread of this potentially fatal situation. This plan or guideline shall constitute an integral part of ESMP measures for every sub-project, though is not included in this report to keep it concise and specific, and the contractor is required to keep the copy of that guideline at every site office.

However, among many other relevant issues, the guidelines emphasize on following line of directives:

a. Contractor must designate one of his employees as H&S/Safeguards supervisor to lead, coordinate and interface in order to fight the COVID 19 situation under the direct guidance of COVID focal at PIU of EMCRP project.
b. All workers, supervising and supporting engineers and staffs, consultants, service providers and other concerned parties must adhere to the personal health and hygiene rules, social distancing, and other protective measures in full in order to protect themselves and contain the infections any further. Necessary training and awareness campaign will be aligned with the specific sub-project scenario and prevailing conditions.

c. General practice of cleaning and hygiene has to be maintained in all project/site offices and camp sites, and supply of necessary PPEs and cleaning /disinfecting materials along with proper use of those is to be ensured.
d. Public consultation and stakeholder engagement are to be carried out considering the prevailing risks of virus transmission in the target areas, scope of interventions and level of ICT penetrations among the target stakeholders, and so on.
e. Necessary protocols have to be established and maintained in case of handling a sick employee or worker, and appropriate compensation to a sick disengaged labor is required to be given with due documentation.
f. Budgeting for suggested protective measures, along with necessary supervision and monitoring for the required interventions has to be ensured.

Following the additional health and safety measures presented in that guideline, sub-project component specific BOQ items have been inserted to supplement the budget considering the country-specific situation, capacities, and scope of interventions. The additional cost to Health and Safety Measures under COVID 19 situation is shown in **Appendix-3.**

4.3 Cost of Environmental Enhancement Works in BOQ

In consideration to the above-mentioned environmental impacts and their mitigation measures for this sub-project component, a set of items are included in the BOQ of this sub-project component. Social Safeguard Personnel for Environmental and Social Management for Work Package EMCRP/W23 has also been added in the whole BOQ in order to take supervision and leadership to organize Environmental Management under Environmental Enhancement Works. The total costing and estimation have included enhancements such as Grass turfing plans, Tree plantation initiatives, Dust Suppression mechanisms. On the other hand, in order to ensure health safety and sanitary measures of workers PPE, First Aid Box, Labor shed, Environmental management, drinking water facility with water tests, Temporary latrine for both male and female as well as waste disposal systems has been accounted for. Ensuring sustainable labor performance in regards to environmental and social considerations motivational training has been taken into account. An overview of the estimation is given below and the detailed estimated cost to implement the ESMP is shown in **Appendix-3**.

5. LIMITATION OF THIS STUDY

Bangladesh government has imposed a nationwide lockdown to curb the spread of the novel coronavirus in the wake of series of deaths and infections. Authorities declared a ban on passenger travel on all sector from March 24 while all public transport on roads have been suspended from March 26 to stem the spread of virus, officially known as COVID-19. All office works have been postponed and an intended visit to the sites for further consultation with the relevant stakeholders has had to cancel due to this crisis. Therefore, some relevant information and arrangement needs waiting for recovering this pandemic crisis.

6. CONCLUSION AND RECOMMENDATIONS

The overall conclusion is that if the mitigation, compensation and enhancement measures are implemented in full, there will be no significant negative environmental impacts in regards to the selection of location, design, construction, and/or operation procedure of the proposed component.

There will in fact be tremendous benefits from recommended mitigation and enhancement measures and major improvements in quality of life, opportunities in business, trading jobs and ensuring social safety and security will be achieved once the scheme is in operation.

The conclusions of the Screening study can be summarized as follows:

- The communities will receive large benefits through improved infrastructural facilities, transportation & communication etc.
- The short-term negative impacts that may come by the way of air quality, noise, solid waste, occupational health & safety need to be minimized through the management plan.
- The project will create employment for those who live in the vicinity of the construction site and will provide them a short-term economic gain.
- The green belt development, if necessary, for the road site, with large-growing trees at the periphery of the site will give the places a more natural and pleasing appearance.
- A comprehensive Environmental and Social Management Plan (ESMP) has been prepared to mitigate and reduce the adverse impacts that will come out from the Subproject activities.

Implementation of this component will have large positive impacts to the communities in terms of improved infrastructural transportation & communication facilities, which would eventually develop the socio-economic condition of the catchment areas. So, strong recommendation should be put in place to implement the sub-project within shortest possible period of time, and with great care and efficiency.

Annexure-01: Important Environmental Features (IEFs) near site

Detail Environmental features within 100m of the both sides from the center line were collected @300m longitudinal intervals. The findings of the survey for the aforementioned road can be seen in the table below:

Table: Detailed Chainage length and features of the Sub-Project component

Road Name	Shiler Chara Road Id:422945074 **(W23-12)**		**Total Chainage**	1517.0m
Chainage (m)	**Left**	**Right**	**Features**	
000-300	L		Bamboo fence, trees, households, tin fence, brick wall, households, household connecting road to the left, Ward Member's house, tin fence, protection wall, tin fence, household, bamboo fence, trees	
		R	Tin fence, trees, household, electric pole, garden, household, tin fence, mosque, household connecting road to the right, bamboo fence, RCC drain, bamboo fence, trees, garden, electric pole	
300-600	L		Shop, homestead garden, households on high ground, bush, bamboo fence, household connecting road to the left, tin fence, settlement, vegetable yard, bamboo fence, household, cross drain, brick wall, graveyard, U-drain, bush, connecting road to the right, bamboo bush, garden, trees, settlement, household, bamboo fence, trees	
		R	Bamboo fence, garden, bamboo fence, tin fence, electric pole, settlement, homestead garden, vegetable yard, bush, household connecting road to the right, pond, trees, open space, settlement	
600-900	L		Settlement, household, bamboo fence, trees, bush, trees, settlement on high ground, tin fence, bamboo fence, crop field, electric pole, tree, bush, tree, high ground, settlement on high ground, crop field, bamboo fence, settlement, big tree, bush, brick wall, bamboo fence, settlement, shop, culvert	
		R	Open space, trees, electric pole, bush, settlement on high ground, crop field, household connecting road to the right, crop field,	
900-1200	L		Garden, crop field, settlement, bush, trees, settlement, household, U-drain, trees and settlement on high ground,	
		R	Crop field, shop, household connecting road to the right, crop field, earthen drain, bamboo fence, tree	
1200-1517	L		Big tree, settlement, cross drain, bamboo fence, tree, earthen drain, mosque, bush, earthen drain, trees, vegetable yard, bamboo trees, U-drain at the end	
		R	Crop field, wired fence, open space, trees, bamboo fence, bamboo fence,	

Annexure-02: Attendance of consultation meetings for W23/12

EMCRP/W23.12

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)
জরুরী ভিত্তিতে রোহিঙ্গা সংকট মোকাবেলায় বহুখি সেক্টর প্রকল্প
Local Government Engineering Department (LGED)
Public Consultation Participants List

Focus Group Discussion

সময়: 01:08 PM তারিখ: 03/10/2020

উপ-প্রকল্প/কমপোনেন্ট এর নাম: Shilee Chara Road

সভা অনুষ্ঠিত হবে: Abdullah store, shilee chara

ইউনিয়ন: Rajapalong ওয়ার্ড নং: 06 মৌজা: Ukhiya 4750 উপজেলা: Ukhiya জেলা: কক্সবাজার

সাব প্রজেক্ট নং: EMCRP/W23.12

অংশগ্রহণকারীদের তালিকা (পরিচয় ও স্বাক্ষর)

ক্রম নং	নাম	বয়স	পুরুষ/মহিলা	গ্রাম	স্বাক্ষর / টিপসই
০১	মোঃ তাহমুদ হক	৩৫	পুরুষ	মোহাম্মদ আমীন পাড়া	
০২	আহমেদ হোসেন	৬২	"	"	আহমেদ হোসেন
০৩	শুক্র বড়ুয়া	২০	"	শিলের চড়া	শুক্র বড়ুয়া
০৪	মোহাম্মদ হাসান মোরা	৫৪	"	শিলের চড়া	হাসান
০৫	তাহমুদ সুজুকি	২৯	"	"	সুজুকি
০৬	মোঃ তাহমুদ হাসিম	২৫	"	মোহাম্মদ আমীন পাড়া	হাসিম
০৭	মোঃ তাহমুদুল্লাহ	২০	"	শিলের চড়া	Abdullah
০৮	মোসাম্মৎ তাহেরা	৬৪	"	"	তাহেরা
০৯	মীর তাহমুদুল	৩১	"	"	মীর তাহমুদুল
১০	মৈমুনা বেগম	৬০	"	"	
১১	মৈমুনা হক্কী	৬০	"	"	মৈমুনা
১২	আমু বিবি	৭৫	"	"	
১৩	রাক্ষী বড়ুয়া	২৭	"	"	RABUA
১৪	সাহমুল তাহমিদ	৫৩	"	"	
১৫	পলাশ বড়ুয়া	২৭	"	"	পলাশ
১৬	তাহমুশাহ	২৮	"	"	মোঃ তাহমুদুল্লাহ
১৭	মোঃ হাবাবিয়া	৩৫	"	"	হাবাবিয়া

EMCRP/W23.12

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)
জরুরী ভিত্তিতে রোহিঙ্গা সংকট মোকাবেলায় বহুখী সেক্টর প্রকল্প
Local Government Engineering Department (LGED)
Public Consultation Participants List

Focus Group Discussion

সময়: 01:08 PM তারিখ: 03/10/2020

উপ-প্রকল্প/কার্যালয়ের নাম: Shilerz Chara Road

সভা বসিবার স্থান: Abdullah Store, shilerz chara

ইউনিয়ন: Rajapalong ওয়ার্ড নং: 06 মৌজা: Ukhiya 4750 উপজেলা: Ukhiya জেলা: কক্সবাজার

সাব প্যাকেজ নং: EMCRP/W23.12

অংশগ্রহণকারীদের তালিকা (পরিচয় ও স্বাক্ষর)

ক্রম নং	নাম	বয়স	পুরুষ/মহিলা	গ্রাম	স্বাক্ষর / টিপসই
১৮	হাসিনা	৩৮	মহিলা	শিলেরছড়া	হাসিনা
১৯	মোঃ আবছার	২৮	মহিলা	"	আবছার
২০	আবুল হোসেন	২৮	পুরুষ	(illegible)	হোসেন
২১	(illegible)	৬০	"	"	(illegible)

Figure: Attendance of consultation meeting for W23-12

Annexure-03: Pictures of sub-project component location and surrounding features with public consultation



Figures: Present condition of Shiler Chara Road (W23-12) & Public Consultation meeting with Host community

Appendix-1: Environmental Screening Form for examining sub-project component

Environmental Screening Form for Sub-project W23-12

Sub-Project Description Form:

EMCRP/W23- Improvement of 15 roads and construction of culverts with side drains under Cox's Bazar District

Name of Sub-Project: Shiler Chara Road Id:422945074

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Estimated total cost of sub-project (in Taka): 417,036,298.10 Tk.

Estimated construction period duration: 1 year

Estimated total cost of the component (in Taka): **34,160,266.79 Tk.**

Estimated Operation and Maintenance period (life of sub-project): Project design life more than 15 (Fifteen) years but Government policies on how long projects can operate in the camps.

District: Cox's Bazar **Sub-District**: Ukhiya **Union**: Rajapalong

Name of Community/Local Area: Faliapara, Md. Ali Vita, Mohoripara

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):

The Sub-Project is categorized as a village road-A with a proposed design of Bituminous Carpeting through construction of Earth Work. Interventions include **01 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 1455 and **06 nos. Cross Drain** (dimension: 0.750mX 0.750m) at Ch. 352m, Ch. 483m, Ch.455m, Ch. 524m, Ch. 871m, Ch. 1143m and **397.0m RCC U-Drain** (.600mX.600m), **214.0m RCC U-Drain** (.750mX.750m), **315.0m L-Drain** at different chainage, and **118.0m Toe wall** (1.5 height) and **541m RCC Palisading** (brick) work**, 31.0m Toe wall** (2.0 and 2.5 height)and **RCC Retaining wall** (54m X 3.0m). **Road safety** work and **Environmental Mitigation and Enhancement** works are also included. Road safety works are also included in the project activity.

Estimated footprint / land area for this sub-project is 620,453 sq. meter

Brief description of sub-project site: (e.g. present land use, Important Environmental Features (IEFs) near site, etc.:

Proposed road is situated within the catchment area of Faliapara, Md. Ali Vita, Mohoripara stretching 1517 meters. This road starts from east foliapara road and ended in Moulovipara. Being one of the local communities of Ukhia upazila these locations are very familiar to any other part of rural Bangladesh having mosques, village households, agriculture fields to grow crops and vegetation that serves as subsistent gardening. The surrounding area is dominated with agriculture practices as rice production, betel leaf production, vegetable farming etc. Majority of the surrounding space of this intervention is covered with homestead gardens and forests. However, there are no significant eco-sensitive features on the pathway of this proposed road.

Overall Comments

The proposed component of the sub-project (Road construction) is not located within any remarkable environmentally sensitive area and will not cause any severe affect to the environmental settings of the area, thus not going to create intimidation to important environmental features. No drainage congestion/water loggings have been observed in the road area. But, some local trees like betel nut tree, rain tree, mango tree, bamboo bushes etc., or additional vegetation may need to clear out due to construction activities, with appropriate offsetting measures to be taken. No agricultural productive soil will be used for the purpose. Earth will be compacted for stabilization. The inputs will be mainly at construction phase and limited within project boundary. Moreover, mitigation measures will be taken according to the ESMP for minimizing the air, dust and noise pollution.

It has been revealed that this project's scopes of works do not intend to overtake their area of lodgment and funding entity has no intention to do so. Moreover, other issue has also been brought to their attention that drainage system and a bridge have also been included into the evaluation of this project since runoff from higher grounds are also a concerning matter during rainy season.

People of the subproject area are very much optimistic about the success of the project and are also eager to participate in the project activities. The subproject is environmentally sustainable and socially acceptable. The local community attended in the participatory public consultation meeting. Their community representatives as teachers, shop owners, farmers and elders have no objection to the construction this infrastructure in the proposed site; the community also appreciated the initiative of LGED to ensure safe access and better portability. The public consultation meeting results confirmed that improvement of this road will increase socio-economic interest in the communities and make lives easier for these people. They also requested to construct the road in accessible width so that small auto and motor vehicles can pass easily. On another matter, locals requested to involve the local community to construction works and material storage monitoring duties.

The road is not located within any identified environmentally sensitive area, and therefore, does not seem to cause any adverse impact on the important environmental features. No significant impact is expected on the ecosystem and biodiversity, no agricultural land/ activities or fish farming will be disturbed, due to the construction of the sub projects. Only forest is found as homestead forest on high grounds of the location.

Types of waste to be generated during construction and operation phase:
During construction period solid waste will be generated due to construction activities. The types of wastes are brick pit, unused sand, wood, gravels, bitumen etc. The types of wastes are gravel, stones, rock, wood, copper wires, concrete, iron, plastic etc. Negligible amount of plastic will come as residue. Moreover, liquid waste will include chemicals of bitumen leftovers, motor oils, used oil, degreasing solvents etc. Human wastes and kitchen wastes will be generated from labor camps as well.

Sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site including elephant migration routes and remaining forests:

Within the influence area of the subproject no historical sites were identified. Sensitive environmental, cultural, archaeological, religious sites within 1 kilometer of site includes including Technical College (900m), Households (50m) to the North. East Foliapara Mosque(50m), Ad Ali Vita Mosque/Madrassa/Hefzokhana(200m), Makaria beel (800m), Maskaria School(500m) to the south. Moulovipara Mosque (500m), Shoilerchora Buddhist Mondir (500m) to the east and Foliapara Mosque/Hefzokhana/Madrassa (300m), Md. Ali Vita Buddhist Mondir(300m) to the west. Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists.

Mostly human settlements are found around the sub-project area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). Elephant migration routes were about 5-6 km away from this sub-project. No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below

Section A: Sub-Project Overview

Description of sub-project/component interventions:

This intervention will include the following items;

- **01 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 1455
- **06 nos. Cross Drain** (dimension: 0.750mX 0.750m) at Ch. 352m, Ch. 483m, Ch.455m, Ch. 524m, Ch. 871m, Ch. 1143m
- **397.0m RCC U-Drain** (.600mX.600m)
- **214.0m RCC U-Drain** (.750mX.750m)
- **315.0m L-Drain** at different chainage
- **118.0m Toe wall** (1.5 height)
- **541m RCC Palisading** (brick) work
- **31.0m Toe wall** (2.0 and 2.5 height)
- **RCC Retaining wall** (54m X 3.0m).
- **Road safety** work and **Environmental Mitigation and Enhancement** works are also included (description of such items can be found in BOQ)

Sub-project Location:

Important Features	
ID	422945074
District	Cox's Bazar
Upazila	Ukhiya
Union	Rajapalong
WARD	06
Proposed Chainage	1517m
Road Type	Village Road-A
Proposed Intervention Type	BC
Distance from Upazila HQ	900m
Road Starting Point Coordinates and name	Latitude: 21.236180 N Longitude: 92.142230 E

	Road starts from East Foliapara road
Road Ending Point Coordinates and name	Latitude: *21.25546^0 N* Longitude: *92.18069^0 E* Ends in Moulovipara

Land ownership
Government Land

Expected construction period: 1 Year

Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water bodies, etc. and historical or socio-cultural assets): Please also explain any analysis on alternative location was conducted:

Technical College (900m), Households (50m) to the North. East Foliapara Mosque(50m), Ad Ali Vita Mosque/Madrassa/Hefzokhana(200m), Makaria beel (800m), Maskaria School(500m) to the south. Moulovipara Mosque (500m), Shoilerchora Buddhist Mondir (500m) to the east and Foliapara Mosque/Hefzokhana/Madrassa (300m), Md. Ali Vita Buddhist Mondir(300m) to the west.
Within the influence area of the subproject no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (checked with local IUCN representative).

Section B: Environmental Screening

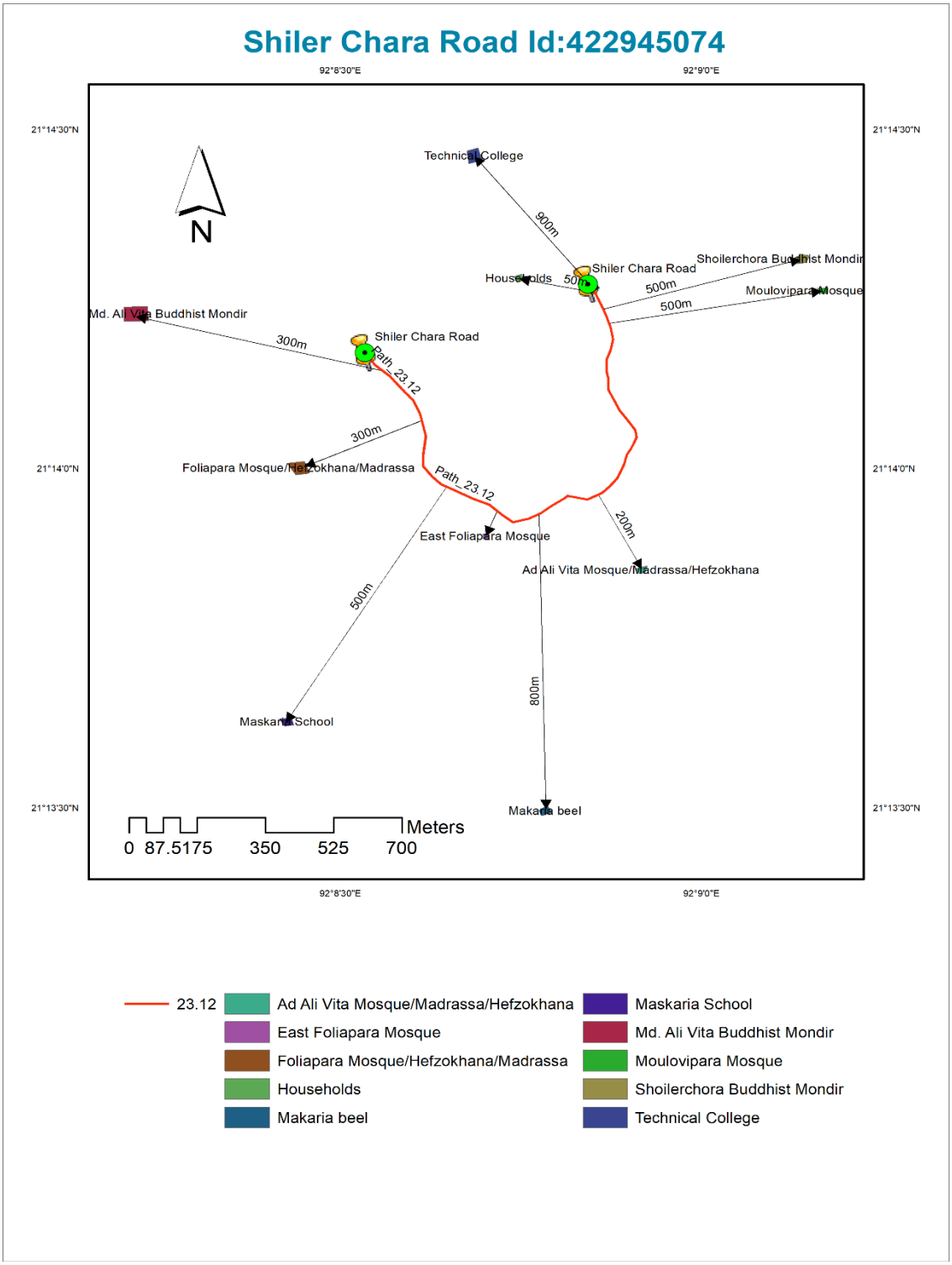
***B.1*: Environmental feature of sub-project location**

Description of cultural properties (if applicable, including distance from site):
Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests:

Technical College (900m), Households (50m) to the North. East Foliapara Mosque(50m), Ad Ali Vita Mosque/Madrassa/Hefzokhana(200m), Makaria beel (800m), Maskaria School(500m) to the south. Moulovipara Mosque (500m), Shoilerchora Buddhist Mondir (500m) to the east and Foliapara Mosque/Hefzokhana/Madrassa (300m), Md. Ali Vita Buddhist Mondir(300m) to the west.

There are no other sensitive environmental, cultural, archaeological sites within the catchment area of this sub-project.

A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas are shown below.



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive features found in the footprint area, except matured vegetation on the sides of the road which are homestead gardens and forest. Several mosques, madrasa and local settlement were found during the survey. It will not be affected by the construction works, as the activities will be carried out within the existing subproject boundary and

necessary preventive and mitigation measures will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*

No. There is no existence of Elephant corridor/ route now, which have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) potential impacts on remaining forests in/around camps Yes/No

N/A (This activity will be confined within the existing subproject boundary)

(3) Other issues: N/A

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:

Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of vehicle-related pollutants 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/ preventable by mitigation measures.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, tractor, trailer, etc. move on roads adjacent to sub-project throughout the day and night generate noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation):

Landslide potential is low. There is low possibility of soil erosion or landslide during construction period of targeted sub-project. The impacts are negative but very small scale, site-specific within a relatively small area and adjustable by mitigation measures.

Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH):

Groundwater is the main source of potable water in the Sub-project area. The shallow depth is

about 80 feet to 100 feet and deep tube well depth is 700 to 750 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 600-800ft (Field survey, 2019). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer.

Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)

Status of wildlife movement:

N/A (None of the information was found about the wildlife movement in or across the area)

State of forestation:

Patches of vegetation containing large and matured trees are present in local and homestead gardens across the road side of the proposed subproject area which are located within 200m radial distance.

Summary of water balance analysis (For water supply scheme only):

N/A

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g. status of access road or any other facility required for sub-project to be viable):

An access point called East Foliapara road is available. It is possible to carry construction materials on these roads to the construction site with limited traffic flow to avoid congestion.

Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction:

Toilet and water supply facilities will be ensured by the contractor in the vicinity of the construction area for all the components of the sub-project, electric connection will be established with the accommodation facility due for the workforce.

Electricity is available in the area.

Possible location of labor camps:

Labor camp can be established along the road since there are available open private lands. However, this will have to be done with the consent of land owner under a mutual agreement, with the supervision of the Engineer in charge.

Requirement and type of raw materials (e.g. sand, stone, wood, etc.):

i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction.

Identification of access road for transportation (Yes/No): Yes. East Foliapara road is available as connecting road
Location identification for raw material storage: Adjacent to labor camp or different location is available. However, this will need placement on open fields and should be consulted with local committee. Material storage area must be well fenced and materials will be covered with tarpaulins.
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.): Earth/ mud, plastics, brick chips, dust from bricks during construction of project components will be produce. Also, sludge will be produced from labor camp latrines and kitchen waste mostly composing of organic matters as fiber, starch, carbohydrates and proteins. 10% of the kitchen waste may be classified as plastics or non-biodegradables. Solid waste may amount to 20 kg daily and sludge may amount to 5 kg per day.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g. Solids wastes, liquid wastes, etc.): **Solid waste:** Residual waste from the labor camps will be generated. Equipment maintenance/vehicles on-site and scrap material will occur during construction works which are mostly solid waste. Leftover oils or spills from machinery can be a high probability generating liquid waste. Waste from civil works. And the quantity will be tentatively 150 kg. **Liquid waste**: During construction period fecal sludge will be generated from the labor camp and the quantity would be nearly 6 kg per day, which would be reduced in weight in course of time. Leftover oils or spills from machinery can be a high probability generating liquid waste.
Type and quantity of raw materials used (wood, bricks, cement, water, etc.): **Type:** i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction. **Quantity**: It is difficult to give exact figures of construction waste produced on a typical construction site.
Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards: No vegetation is present in the right of way. Specific soil amount is not needed for the project. The current condition explains that there is no aggregated soil on the right of way.
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito

breeding and other disease vectors: (High/Medium/Low with explanation) The possibility is Medium, for stagnant water bodies to occur. Because water usage will be higher during the construction period. By default, this area has no water logging troubles due to being natural channels. Moreover, no possibilities of stagnation of water in long run. So, local communities have stated that they do not have severe troubles with mosquitos or other disease vectors.
Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No pre-existing waterbody or drainage is present
Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. Because under this intervention, there is very little scope of damage to terrestrial or aquatic ecosystems or endangered species.
Activities that can lead to landslides, slumps, slips and other mass movements in road cuts: Scope of work leading to low scale effects of landslide. The impacts are negative but short-term and site-specific. It can be managed through mitigation measures.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description) Low, since both sides of the road is more or less similar elevation. The concentrated outflow will be managed since the sub-project has included drains.
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials. The existing HBB and BFS part of the road is adequate for traffic movement however, contractors will have to maintain traffic plan so that local transports do not find it difficult to pass during construction work.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: No
Chance of long-term or semi-permanent destruction of soils: (High/Medium/Low with description) No
Possibility of odor and water, soil quality impacts from SWM and FSM disposal system: (High/Medium/Low with description)

No
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) There is no possibility of stagnant water bodies remained for encouraging mosquito breeding and other disease vectors, during the operation phase.
Likely direct and indirect impacts on economic development in the project areas by the sub-project: Construction or implementation of a road project substantially contributes to the development of the project areas. It surely improves the communication network, reduces the transport time, increases the trade and business in/around the areas, and ensures access to better living conditions with amenities, better educational and job opportunities and health facilities. Thus, the direct and indirect impacts on economic development in the project areas would be enormous by this sub-project.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No existing drainage channels or surface water bodies found in the project area; therefore, no such effect can be anticipated
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. There are no protected areas in or around project sites, and no known areas of ecological interest.
Activities leading to landslides, slumps, slips and other mass movements in road cuts: The entire sub-project component area is nearly flat; thus, no such type of impacts is anticipated.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) No
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: Improved communication will definitely increase the traffic/ vehicular movement, which must increase the light and noise pollution, but air pollution effect will not be increased significantly, as the proposed BC road will reduce the pollution generated from dust on the muddy road, especially during the dry season and if the vehicles are maintained in good conditions

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

Section D: Environmental Screening Summary of the Work Package-W23.12

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
1: Sub-Project Interventions	**Air quality**	Under the subproject intervention the overall score is **low**.	• Limiting earthworks; • Watering of dry exposed surfaces and stockpiles of aggregates at least twice daily, as necessary; • Requiring trucks delivering aggregates or bricks and cement to have tarpaulin cover and Limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Covering of trucks; • Records of air quality inspection;	Visual monitoring of air quality and if requires, air quality test (CO, $PM_{2.5,10}$) once in construction period in winter season.
	Soil impacts	Under the sub-project intervention the overall score is **low.**	• Precautions might be taken when rainstorms are likely, when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms. • The earthwork sites where exposed land surface is vulnerable to runoff shall be consolidated and/or covered. • The material stockpile sites shall be far away from surface water bodies and areas prone to surface run-off. Loose materials shall be bagged and covered. • Channels, earth bunds, netting, tarpaulin and or sand bag barriers	Construction Contractor monitored by Consultant and PIU	• No visible degradation to nearby drainages, • *khals* or water bodies due to soil erosion. • Rain storms in construction phase.	Monitoring as weekly basis.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
			shall be used on site to manage surface water runoff and minimize erosion. • The overall slope of the work areas and construction yards shall be kept to a minimum to reduce the erosive potential of surface water flows elsewhere.			
	Hydrology (surface and groundwater)	Under the subproject intervention the overall score is **low**.	• All precautions to store chemicals/oil/fuel properly so that no chance of spill. • Workers must specify waste dump locations to avoid littering which in turn might negatively affect surface and ground water. • Monitor water quality according to the environmental management plan.	Construction Contractor and monitored by Consultant and PIU	• Areas for stockpiles, storage of fuels and lubricants and waste materials; • Records of water quality inspection; Water Quality Test • (National Drinking Water Quality Standard Parameters)if requires; • No visible degradation to nearby drainages, *khals* or water bodies due to construction	Water quality test (mainly GW) twice during the construction period in six months interval.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
					activities. • Records should be kept and logged.	
2: Pre-construction Phase	**Sanitation, water supply**	Under the subproject intervention the overall score is **low**.	• Provide suitable housing, adequate supplies of potable water, and toilet and bathing facilities within labor camp area for the assigned laborer. • Provide means for disposing of wastewater from toilets, baths and food preparation areas either through a septic tank and soak away, or holding tank with removal by vacuum truck. • Records for any type of training or awareness building sessions must be kept at site.	Construction Contractor and monitored by Consultant and PIU	• Site-specific H&S Plan; • Records of supply of uncontaminated water; • Record of Health &Safety orientation trainings; • Condition of sanitation facilities for workers	Visual inspection by PIU and supervision consultants on monthly basis
	Transportation	Under the subproject intervention the overall score is **low.**	• Contractor should verify vehicles for the suitability of carrying, loading and unloading of materials	Construction Contractor and monitored by Consultant and PIU	• Record of regular inspection. • Record of accidents/incidents	Monthly monitoring.
	Storage of construction	Under the subproject	• Orienting concerned person and team assigned for the construction	Construction Contractor and	• List of materials and sources of	During implementation

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
	materials	intervention the overall score is **low**.	work.	monitored by Consultant and PIU	materials;	phase, as necessary with discussion with PIU, Consultant
3: Construction Phase	**Wastes**	Under the sub-project intervention the overall score is **low.**	• Prepare and implement on-site waste water runoff and labor camp waste management plan approved by PIU and consultants. • Wastes must be placed in the designated bins which must be regularly emptied. These shall remain within demarcated areas and shall be designed to prevent wastes from being blown out by wind. • All waste must be removed from the site and transported to a disposal site.	Construction Contractor and monitored by Consultant and PIU	• Complaints from community; • Regular inspection of waste management activity; • Waste disposal record.	As work weekly progresses
	Cut and fill Activities (Cutting of hill slope and earth removal from borrow areas caused for soil erosion and landslides)	Under the sub-project intervention, the overall score is low.	• During construction cut and fill will be balanced as far as is possible. Designs shall ensure that as far as possible all cut and fill activities are balanced • Proper care will be taken during cutting and filling so that slope or toe of the road embankment remain within the right of way and does not disturb the crop.	Contractor, environmental specialist of D&SC	• Location of road alignment and slope.	Daily as work progresses

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
	Storage of materials	Protected and safety storage to be needed for construction materials storage. Not interrupt natural land contours, disturbance in natural drainage patterns and logging of water and the overall score is **low.**	• With the assistance from site management committee in Camp to identify the storage site and other requirements, which will be approved by PIU and consultants.	Construction Contractor and monitored by Consultant and PIU	• List of materials and sources of materials; • Storage areas for materials and equipment.	Monthly basis during implementation phase, as necessary with discussion with PIU, Consultant
	Removal of Vegetation (May cause soil erosion and their deposition on nearby crop field, affecting soil quality and productivity)	Under the sub-project intervention, the overall score is **low.**	• If during detailed design cutting of trees is required, compensatory plantation for trees lost at a rate of 5 trees for every tree cut. • Prevent workers or any other person from removing and damaging any flora (plant/vegetation) and fauna.	Contractor, environmental specialist of D&SC	• Complaints from community;	Daily

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
	Noise pollution	Under the subproject intervention the overall score is **low.**	• Consultation with affected people; not to operate noisy equipment during working period; • No noisy work after 5.00 pm. • Sound suppression for equipment; • Ear protection for workers. • Conduct noise quality monitoring as per EMP.	Construction Contractor and monitored by Consultant and PIU	• Number of complaints from stakeholders; • Use of silencers in noise-producing equipment and sound barriers; • Noise Level following decibel meter (dB)	Inspection by PIU and supervision consultants on monthly basis;
	Air pollution	Under the subproject intervention the overall score is **low.**	• Water spraying for dust control; construction materials with potential for significant dust generation shall be covered; no smoke emitting equipment; and limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor and monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Records of air quality inspection.	Visual observation and monitoring of air quality during construction period.
	Road Safety and Accidents	Under the subproject intervention the overall score is **low.**	• Erection of suitable signage at construction sites • Direct observation and discussion with local people • Restrict the transport of oversize loads. • Operate construction vehicles to non-peak periods (night) to minimize the traffic disruption. • Enforce on-site and access road speed limits.	Construction Contractor, environmental specialist of D&Sc.	• Complaints from communities, pedestrians	Day basis during work time

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
			• The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc. • Local residents should be kept informed about planned Works			
4. Post Construction	**Road Safety**	Under the issue the overall score is **low**.	• Install traffic signs for speed limit, speed breaker where needed, Mile post and create adequate ***traffic*** detours, and sufficient ***signage*** & ***warning*** signs, Post speed limits and suitable bending on the road. • The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc.	Construction Contractor, environmental specialist of D&Sc	• Road signage and safety instruments at suitable locations and chainage	Immediately after the construction work is over.
	Tree re plantation	Under the issue the overall score is **low**.	• Replantation of trees during monsoon period • Maintain of trees properly • Check survival of trees and replant the dead trees	Construction Contractor, environmental specialist of D&Sc	• Number of complaints from stakeholders; • Records of trees number and tree plantation inspection;	Immediately after the construction work is over.
5. Operatio	**Maintenance of road and**	Under the issue	• No advertisement/boardings shall be allowed within the Right of Way	LGED	• Number of complaints from	During Operation under LGED's

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
nal Phase	**assets** (Road accidents may increase due to higher number of vehicles using the roads at increased speeds)	the overall score is **low**.	limits of the project road. • Regular maintenance and cleaning of assets such as sign boards, road safety sign etc. shall be undertaken. • Clear smooth speed breaker/rough surfaces should be clear in views. • Regular maintenance of road surface and shoulders.		stakeholders;	regular maintenance program in each 3 years.

* Overall Impact Score: High = Likely to cause long-term E&S impacts; Medium = Likely to cause temporary impacts; Low = Likely to cause little, short-term impacts

**Post-construction phase denotes the time period contractor use to clear and clean up the sites after the construction work is ended, perform tree plantation, grass turfing, and minor rectification till the official handing over the site to LGED, or owner of the site.

Recommendation for further environmental and social assessment and/or site specific environmental and social management plan: Yes

**If yes, please specify what assessments/plans would be required.* Mention some recommendation on E&S assessment …. ESMP

If site specific environmental and social management plan (ESMP) is followed the impacts can be mitigated and monitored. ESMP is attached.

Appendix-2: Environmental and Social Management Plan (ESMP)

ESMP for Access and evacuation Roads; *(LGED/EMCRP-W23.12): Shiler Chara Road (W23-12)*

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
Pre-Construction Stage	Loss of land / and other physical assets	• No land acquisition is allowed within this sub-project activities So, there are no any mitigation measures according to this impact.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of livelihood	• Under this subproject, there is no scope of negative impact of adjacent livelihoods	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Stakeholders Engagement	• All of the project stakeholders should be consulted • Separate community level consultation meeting with the potential affected HHs • Consultation meeting with host communities about the project objectives and scope of works	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of right to access	• Project to ensure thorough analysis of alternatives that access enjoyed by the community remains intact. • In case of unavoidable circumstances, alternative access will be provided.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Site Selection & implementing interventions: Human-elephant conflict	• Selection of sub-project sites and all implementing interventions must take place outside of the elephant corridor/influence area.	PIU	Environmental Consultant of PIU, PSC
Pre-Construction Stage	Site Preparation: Soil Erosion; Alteration of natural drainage	• Our selected sites avoided the low land near the water bodies or natural flow path to avoid the flash flood or any kind or surface runoff.	PIU & Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Tubewell location within the construction site is not near to any kinds of latrine and soaks well which could be contaminated by those. • After completing the development, we restored the place as like before to avoid the cut and fill operational problems. • This site is in the local community, so we discussed with the local community to avoid any conflicts related local habitation, culture. • Sub project intervention mustavoid of natural disturbance of existing slop and natural drainage. • The contractor ensuring sound environment for the local residents near the sub project site.		
Construction Activity	Noise from construction works	• Construction activities mostly will finish at day time within 05 PM, and must confirm proper measures for avoiding any disturbance. • All Personal Protective Equipments (PPEs) must be ensured in sites before starting any kinds of construction works.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Dust	• Acceptable range of emission of CO, particulate matter [SPM (**Suspended particulate matter)**, PM2.5, 10] and Hydrocarbons must be maintained through good construction work practices • Dust generation must be limited as a result of clearing, leveling and site grading operations with using water florescent manually and through water	Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		pipes. • Dust generation due to vehicle movement on connecting road shall be controlled by watering the path at limited level		
Construction Activity	Safety Issues	• Unauthorized entry is completely prohibited in our site and take necessary measures for preventing this problem • Before works started Contractor must provide proper training and guidelines on health and safety issues to the labors and associated staffs. • Records of every training must be kept at site. • All kinds of Child labour are completely prohibited in every site. • Every construction materials storage site will be well fenced by Tin and safety caution tape.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Traffic Management	• Contractors will maintain proper route for traffic management which is to beconsulted with and confirmed by the Executive Engineer of Cox's Bazar.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Conflicts with existing users due to the scarcity of resource base.	• A detailed assessment of the available resources and consent of the local representative for withdrawal of water from existing surface water sources shall be taken. • If ground water is withdrawn, adequate approvals from the appropriate department need to be undertaken before setting up bore wells. • Any type of consent letter or agreement for	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		withdrawing water from either surface or underground sources will be kept on site. • Local community must be consulted before any construction works starts.		
Construction Activity	Increase in road accidents	• Maintain safety measures during the movement of heavy machinery and equipment. • Local community will be trained up on traffic management and awareness.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Labour Base Camp: Conflicts with the local residents	• Awareness building session will be undertaken about prevention of child abuse, child marriage, GBV, sexual harassment, trafficking of women and children as well as illegal drug trade. Written records of this awareness building session shall be kept on site. • Work force should be prohibited from disturbing the flora, fauna including hunting of animals, wildlife hunting, poaching and tree felling. • Adequate facilities ensuring sanitation for labour camps will be put in place • Treated water will be made available at site for drinking purpose. • Adequate accommodation arrangements for labour forces. • Labor code of conduct is to be disclosed through consultation.	Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Construction Activity	Waste Management: Improper management and handling of	Preparation of a waste management plan covering the following aspects:	Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
	hazardous and non-hazardous waste during construction.	• Residual waste from the temporary accommodation facilities for labor Waste and from equipment maintenance/vehicles on-site • After completion of construction works. So, recycling process is not applicable. • Proper consents for hazardous waste management.		
Construction Activity	Health & Safety Risks: • The potential for exposure to safety events such as tripping, working at height activities, fire from hot works, smoking, failure in electrical installation, mobile plant and vehicles, and electrical shocks. • Exposure to health events during construction activities such as manual handling and musculoskeletal disorders, hand-arm vibration, temporary or permanent hearing loss, heat stress, and dermatitis.	• All construction equipment will be properly inspected timely. • The risk assessment will be prepared and communicated prior to the commencement of work for all types of work activities on site. • Preparation of proper walkways and clearly designation as a walkway has to be ensured; all walkways shall be provided with good conditions underfoot; signposted and with adequate lighting. • Proper Signpost at any slippery areas will be ensured in construction site. • Fire extinguishers will be located at identified fire points around the site. The extinguishers must be appropriate to the nature of the potential fire. • This sub project has Proper communicative emergency response plan (ERP) with all parties, the ERP to consider such things as specific foreseeable emergency situations, organizational roles and authorities' responsibilities and expertise, emergency response and evacuation procedure and personnel will	PIU & Contractor	Environmental Consultant as well as Social Development and Gender Specialists of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		be trained and drilled to test and ensure the coherence with the plan. • All people of construction site will be concerned about the safety and maintenance of Electrical equipment; works will be carried out on live systems. • Provision to first aid box in sub-project areas will be ensured. • Proper Emergency evacuation response plan will exist in sub-project area. • All safety equipment will be available in sub-project site (safety, size, power, efficiency, ergonomics, cost, user acceptability etc.), the lowest vibration tools will be provided that are suitable and can do the works. • Awareness training will be given to all personnel involved during the construction phase in order to highlight the heat related illnesses of working in hot conditions such as heat cramps, heat exhaustion, heat stroke, and dehydration. Written records of this awareness training shall be kept on site. • Adequate quantities of drinking water will be available at all Sites, on different locations within the site. • Provision to maintain proper PPE wherever necessary and to ensure that there are satisfactory washing and changing facilities. • Provision to ensure all workers exposed to a risk are aware of the possible dangers and also given thorough		

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		training on how to protect themselves and there should be effective supervision to ensure that the correct methods are being used.		
Operation &Maintenance	Noise disturbances to fauna	• Provision to maintain noise and vibration from the operation and maintenance of machinery and equipment by proper monitoring and measures. • Provision to take necessary lighting, caution for the works and necessary maintenance should be done in day light.	PIU	Environmental Consultant of PIU, PSC. Union Member
Construction activity	Odours and pollution caused by leaking latrines and faecal sludge, and solid wastes impacting surrounding water bodies, flora and fauna	• Preventative maintenance schedule should be followed. • Solid organic wastes should be stored in bins and/ or skips and emptied regularly at a designated waste disposal area away from the camp site. If no designated site is available within the reach, a dug-hole at a nearby place can be used with periodic filling with soil layer for preventing pollution and generating nutrient rich compost soil over time.	PIU	Environmental Consultant of PIU, PSC. Union Member
Decommissioning during the project implementation period (including site clearance after the construction)	The impacts are similar to those listed in construction stage: • Pollution from waste materials • Health & Safety risks to workers and local community	• Contractor must prepare a demolition and waste management plan including following directive aspects given hereunder.	PIU / Contractor	Environmental Consultant of PIU, and Executive Engineer of Cox's Bazar

Waste Management Plan:

The Contractor shall develop a waste management plan for various specific waste streams (e.g., reusable waste, flammable waste, construction debris, food and organic waste etc.) prior to commencing of construction and submit to LGED for approval. The plans must include following principles or series of actions, which will be carried out/followed by the contractor and supervised by the Field level Environmental Specialist and Social Development Specialist.

For wastes:

- The quantity of waste materials shall be minimized by 3R (Reduce, Recycle and Reuse) approach, and wastes shall be segregated accordingly, wherever practical; and stored in designated places/facilities in the site.
- Construction site shall be maintained in a cleaner, tidy and safe condition and appropriate facilities shall be provided and maintained as temporary storage of all wastes before transportation and final disposal.
- Hazardous waste viz. waste oil etc. will be collected and stored in a paved and bounded area and subsequently sold to authorized recyclers.
- The scrap material generated from related construction activities will be collected and stored separately in the stack yard and sold to local recyclers.
- All wastes generated during construction shall be disposed off in an environmentally acceptable manner. This will include consideration of the nature and location of disposal site, so as to cause less environmental impact.
- Other leftover non-hazardous wastes, including construction debris shall be transported to an approved disposal site by pick up tracks or back loaded vehicles with proper care.
- Organic wastes produced in the camp site during the construction period shall be collected and transported in vehicles covered with tarps or nets to prevent spilling waste along the route to the designated disposal site;
- Burning of any type of wastes in the construction site shall be prohibited completely.

Prepared by: Harogopal Kabiraj, Environmental Focal Person, +8801714980171

Tanvir Ahsan Haque, Environmental Specialist, +8801688117059

Ms. Sadia Azad, Disaster and Climate Change Specialist, PIU.

Reviewed by: Md. Saiful Islam, Field Level Environmental Specialist, +8801913442006

Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.12

In consideration to the above-mentioned environmental impacts and their mitigation measures for all sub-projects, individual BOQ for each component has been prepared. Following tables will illustrate such items of enhancement and impact mitigation works as well as considering the emerged situation of COVID-19, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites.

Cost of Environmental Enhancement Works for W23-12 in BOQ

Sl no.	Description of item	Quantity	Unit price	Total amount
1.	**Grass Turfing** Turfing on embankment top and slope, building compound & any critical place with good quality turf supplied by the contractor of not less than 225mm square in dimension including placing and watering till grass is fully grown, etc. all complete as per direction of E.I.C. (Payment to be made only when grass is fully grown)	4539 sqm	@38.15 Tk. Per sqm	173162.85
2.	**Aid Box** Supply of first aid box with standard contents and as per direction of the E.I.C.	01	@5000 Tk. Per box	5000
3.	**Dust suppression measures** Dust suppression measures like water sprinkling on aggregates/ unpaved roads, in and around the work site and as per direction of the E.I.C.	1517 meters	2.56 Tk. per meter	3883.52
4.	**Motivation training** Motivation training (twice: before and after construction start) of the Upazila Engineer' sand Contractor's representatives on safety practice and as per direction of the E.I.C.	LS	Lum Sum @ 10000	10000
5.	**Providing Safety gear/ (PPE)** Providing Safety gear package like hand gloves, eye protection glasses, helmets, rubber shoes, light reflecting dress etc.	LS	@ Tk. 30000	30,000
6.	**Tree plantation** Tree plantation around the shelter or road including maintenance for 2 years as per direction of E.I.C. (Coconut, Mango, Jackfruit etc. to be planted. The payment is to be	160 nos.	@ Tk. 1000 for each tree.	160,000

	made only when trees are fully grown) and as per direction of E.I.C. Total 10 nos. of trees need to be replanted around the periphery of the proposed site at an interval of 10 feet.			
7.	**Temporary Sanitary Latrine** Temporary Sanitary Latrine/ Septic Tank/ Portable Toilet: 2 nos. (1 no of Toilet for female and 1 no of Toilet for male) and as per direction of E.I.C.	2 nos.	@12822.86 per toilet	25645.72
8.	**Waste disposal** Temporary camp site waste disposal facility improvement 2 nos. (1 no of organic waste and 1 no of inorganic waste disposal facility) and as per direction of E.I.C.	LS	@5000	5000
9.	**Drinking water Facility** Supplying continuous adequate drinking water supply at work site and site office as well by installing necessary tube-well/s where applicable with best quality water tank (Gazi/Padma) and water filter of minimum capacity of 30 liters with necessary kits. All complete as per satisfaction of EIC.	2	@30000 tk for each setup	60,000
10.	**Test (Drinking Water samples)** **Water samples** to be collected periodically (half yearly) for Tube well at labor shed for laboratory analysis of different parameters such as pH, arsenic, iron, chloride, hardness, total dissolved solids, nitrate, nitrite, coliform, electrical conductivity etc. all complete as per direction of E.I.C. (including the cost of actual fees for testing from reputed laboratory and report) as desired by E.I.C.	LS	@5000tk	5000
11.	**Traffic Management** Maintaining traffic management at worksite from time of commencement of contractor's activities to time of completion activities, including ensuring that the road is safe for user s and providing a safe working area for those involved in work.	LS	15000	15000
12.	**Worker labor shed** Size (30'X20') with C.I sheet roofing, Tarza fencing and brick soling floor as per requirement and direction of EIC	1	30000	30000
13.	**Environmental management**	1 person	Monthly basis @Tk.	84,000.00

	Environmental management costs of the Environment & Social/ Safeguard Personnel for Environmental and Social Management and Monitoring during construction and operation phase for their salary & transport (Net payment excluding Tax &VAT). And as per direction of the E.I.C. **(One Safeguard Personnel for R1, R2, R4, R10, & R13)**		35,000.00 for 12 months. One person covering 5 roads i.e.35,000Tk.*12months* (1/5 one road).	
	Subtotal Bill: Environmental facilities			**606,692.09**

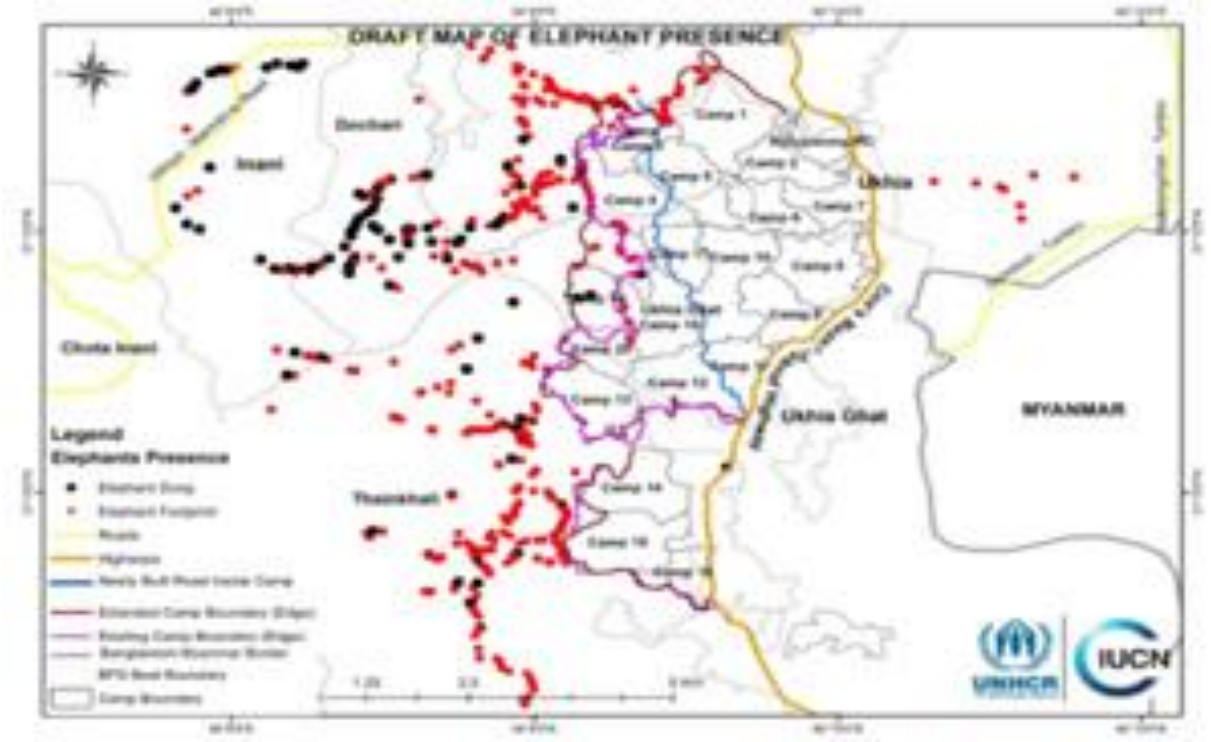
Cost of H&S Measures under COVID 19 Situations for W23-12

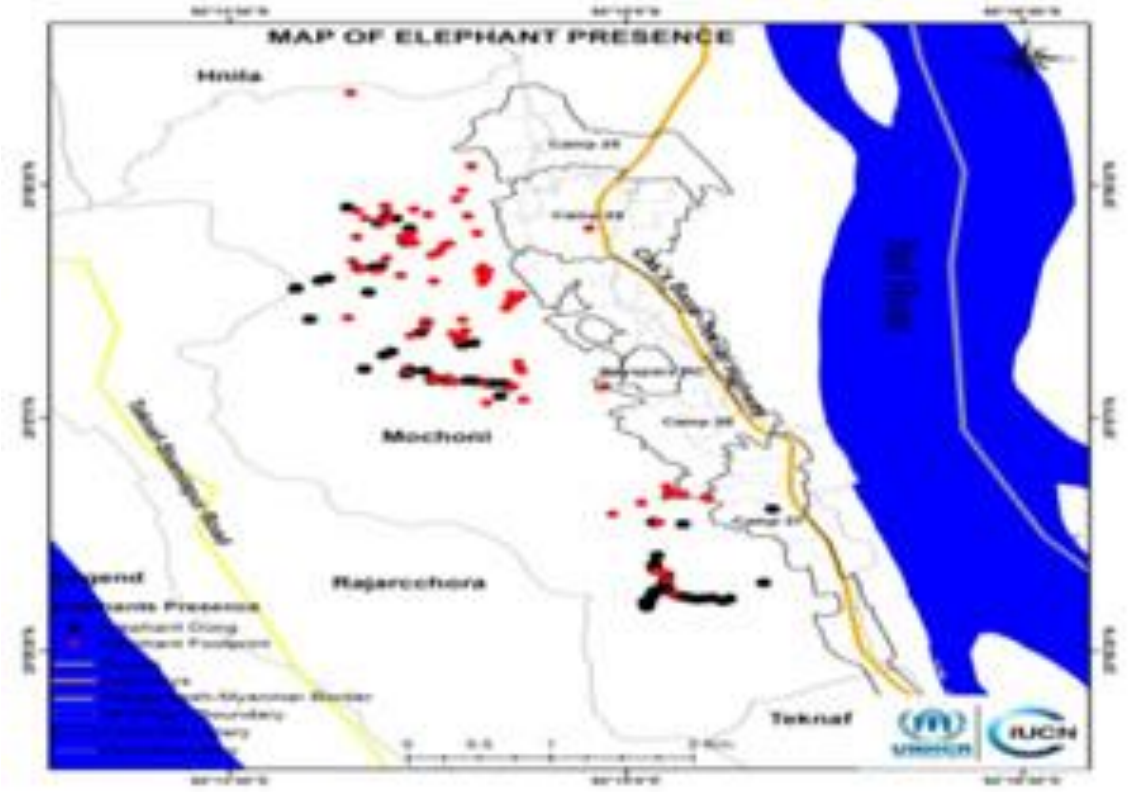
Considering the emerged situation, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites. The cost is estimated counting 30 workers for 270 active working days (9 months in a year) in a contract period for one site under this package (EMCRP/W-23.12).

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
1.	Non-Contact IR Digital Thermometer	01 nos. in each site	N/A	N/A	5,000.00	1	5,000.00	Each site office will have a thermometer for checking body temperature every morning at the entrance of the working site
2.	Wash Basin with Small Water Tank, Bucket and Mug (or piped water supply)	01 nos. in each site	N/A	01 nos. in each camp	10,000.00	2	20,000.00	Wash basin to be installed at favorable locations immediately after the entrance to the facility
3.	Trash bin (covered)/Paddle Bin	01 nos. in each site	N/A	01 nos. in each camp	550.00	2	1,100.00	
4.	Bar Soaps (150 gm each)	81		101	50.00	182	9,100.00	To be placed in a case/holder on the basin, for washing hands for max. 35 people a day and showering of 30 workers in each labor camp.
5.	Hand Sanitizer (2 nos. 250 ml bottle and 5 liter Can for Refill)	2 bottles and 1 Can for each site	N/A	N/A	4,000.00	1	4,000.00	2 bottles and a 5 litre can for each Site office
6.	Face Shield/ Protective Safety	16 nos. for each site		N/A	400.00	16	6,400.00	For labors who work in close contact, 16 in each site

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
	Goggles							
7.	One time Mask (Disposable) for Contractors' Staffs	5 nos. each day in each site		N/A	12.00	1350	16,200.00	Reusing N95/KN95 mask will not be a manageable option in field scenario, one time disposable medical/surgery mask a good option instead.
8.	Cloth mask for Workers	N/A	30 nos. for each labor camp		35.00	540	18,900.00	A worker will use a mask for 15 days with everyday washing
9.	Floor Cleaner (1 litre Can)	1.5 Can	N/A	3 Can	250.00	4.5	1,125.00	
10.	Detergent Cleaner	N/A	1.5 kg in each camp/month		400.00	13.5	5,400.00	To be used for washing clothes, masks and tools & equipment, etc.
11.	Miscellaneous cost				20,000.00	1	20,000.00	Contingency cost for medical emergency and compensation for workers, subject to proper documentation
	Grand Total						**107,225.00**	

Appendix-4: Elephant Migration Routes Map





Elephant presence map (latest information published on 24 May 2018)

Appendix-5: Location Map of Sub-project component

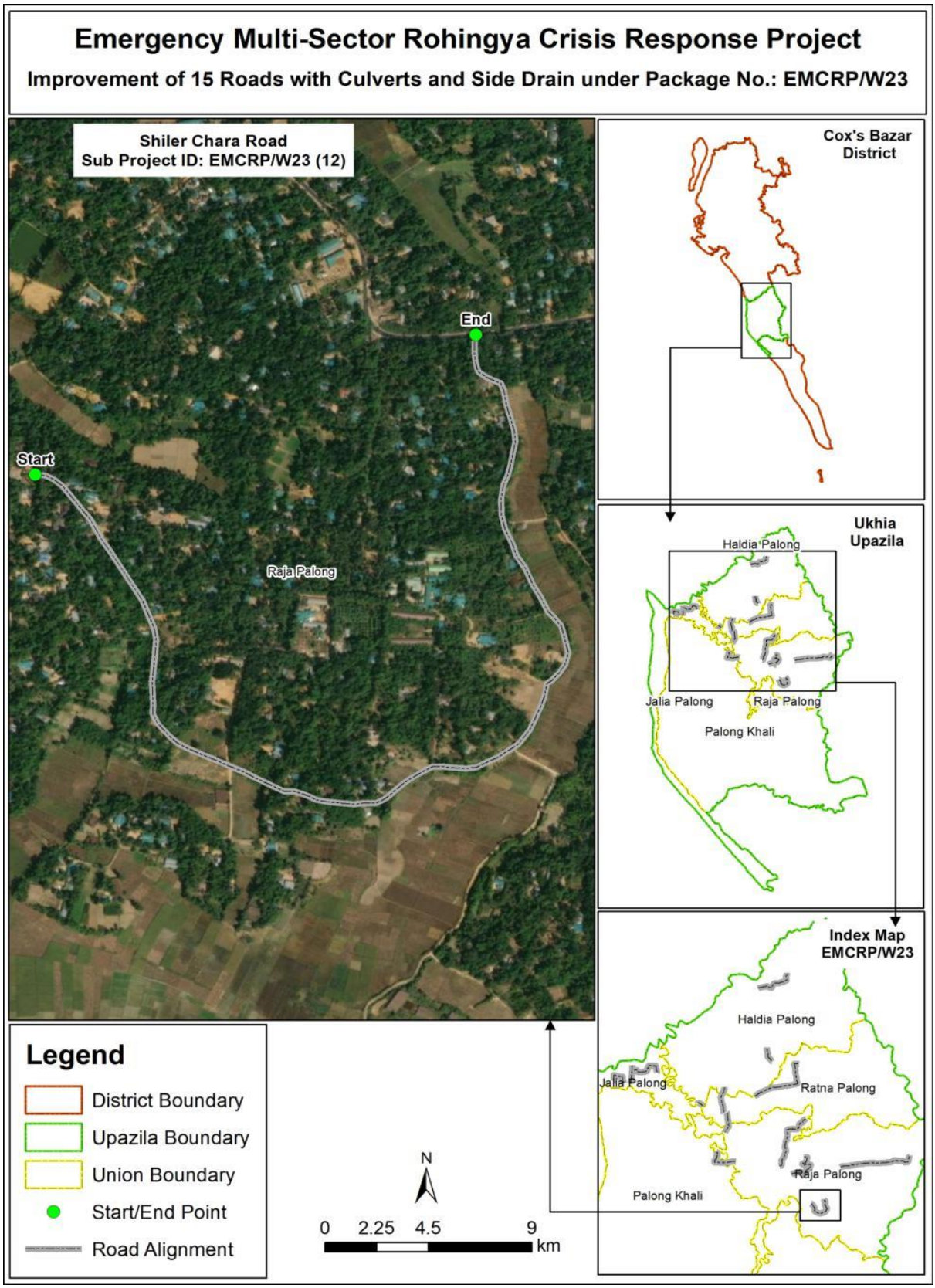
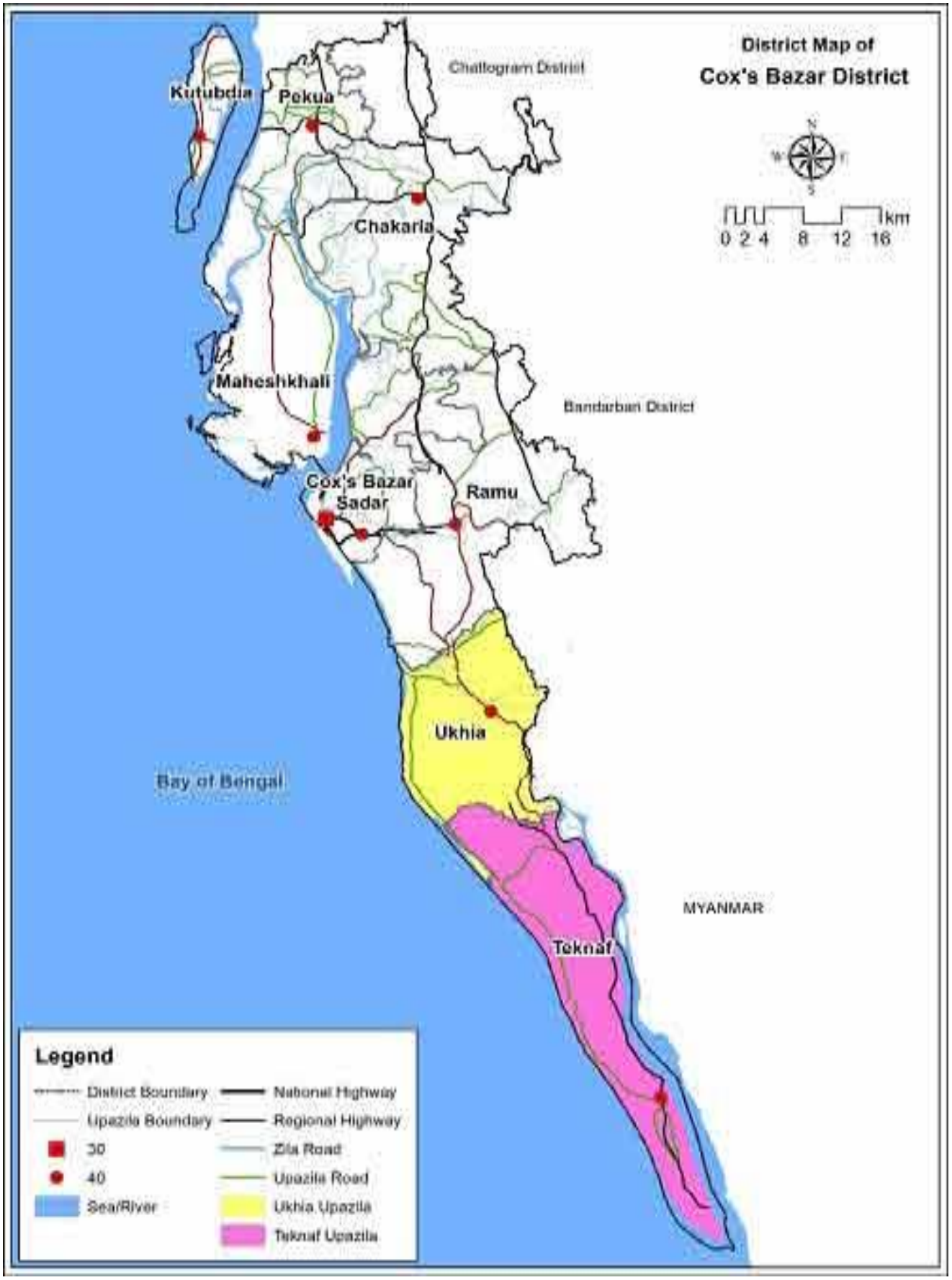
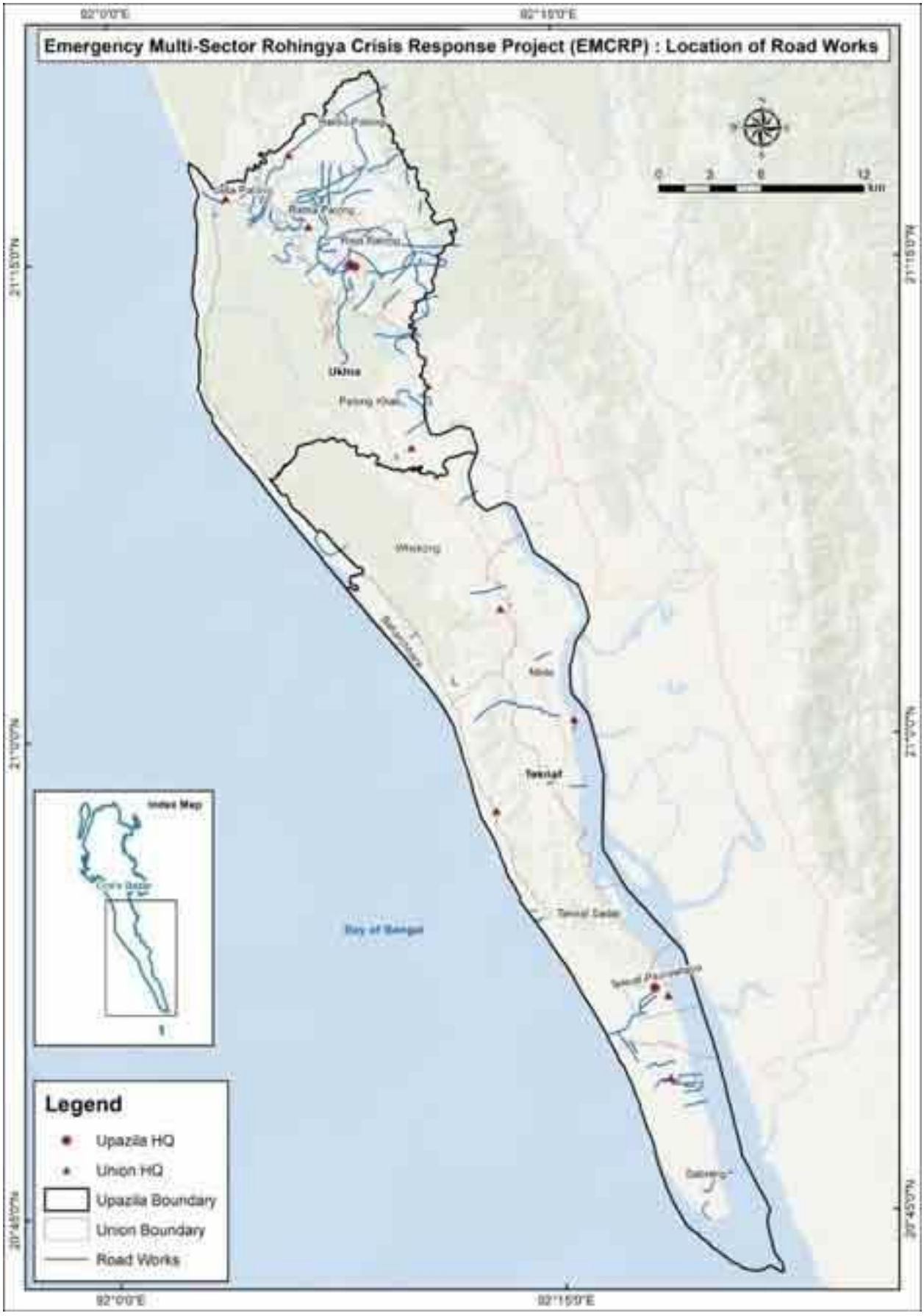


Figure: Location Map of W23-12



District map showing Ukhiya and Teknaf Upazila



Upazila map locating proposed roads

GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH
Ministry of Local Government, Rural Development and Co-operatives
Local Government Division
Local Government Engineering Department

Emergency Multi Sector Rohingya Crisis Response Project (EMCRP)

Project ID: P167762 **IDA Credit No. 5561-BD**





Environmental Screening Report

For Mohasen Ali to baggona Road Id: 422945078 with culverts and side drain under Cox's Bazar District.

Under the package no. EMCRP/W23

Funded by:

THE WORLD BANK
IBRD • IDA

Government of the People's Republic of Bangladesh & World Bank

Design and Supervision Consultancy:

Development Design Consultants Ltd.

October-2020

Contents

1. INTRODUCTION 1

1.1 Project background 1

1.2 Elementary information of Work Package Component of W23.13 2

1.3 Proposed intervention items for this component 4

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS 4

2.1 Methodology 4

2.2 Important features/establishments within the PIA 5

2.3 Issues and Recommendations raised by the Participants 6

3. ENVIRONMENTAL SCREENING 7

3.1 General 7

3.2 Major Findings 8

3.3 Climate Change Impact Screening 10

3.3.1 General Overview of the area 10

3.3.2 Site Specific Screening and outcome 11

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) 12

4.1 General 12

4.2 Health and Safety Measure under COVID Situation 14

4.3 Cost of Environmental Enhancement Works in BOQ 15

5. LIMITATION OF THIS STUDY 15

6. CONCLUSION AND RECOMMENDATIONS 15

Annexure-01: Important Environmental Features (IEFs) near site 17

Annexure-02: Attendance of consultation meetings for W23/13 18

Annexure-03: Pictures of sub-project component location and surrounding features with public consultation 20

Appendix-1: Environmental Screening Form for examining sub-project component 21

Appendix-2: Environmental and Social Management Plan (ESMP) 39

Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.13 47

Appendix-4: Elephant Migration Routes Map 51

Appendix-5: Location Map of Sub-project component 52

ACRONYMS

BOQ	Bill of Quantities
BFS	Brick Flat Soiling
D&SC	Design and Supervision Consultant
DoE	Department of Environment
DRP	Displaced Rohingya people
EA	Environmental Assessment
EC	Electrical Conductivity
EMCRP	Emergency Multi-Sector Rohingya Crisis Response Project
ESMP	Environmental and Social Management Plan
ERP	Emergency Response Plan
ESMF	Environmental and Social Management Framework
FDMN	Forcibly Displaced Myanmar National
FGD	Focus Group Discussion
FSM	Faecal Sludge Management
GBV	Gender Based violence
GPS	Government Primary School
GRM	Grievance Redress Mechanism
HBB	Herring Bone Bond
IEFs	Important Environmental Features
ISCG	Inter Sector Coordination Group
IUCN	International Union for Conservation of Nature
IWM	Institute of Water Modeling
LGED	Local Government Engineering Department
PIA	Project Influence Area
PIU	Project Implementation Unit
PMU	Project Management Unit
PPE	Personal Protective Equipment
PSC	Project Steering Committee
SMC	School Management Committee
SPM	Suspended Particulate Matter
SWM	Solid Waste Management
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
UNHCR	The United Nations High Commissioner for Refugees
VAT	Value-Added Tax
WB	World Band

1. INTRODUCTION

1.1 Project background

An estimated 730,000[1] people of Rohingya community has fled to neighboring Cox's Bazar district of Bangladesh since August 25, 2017 to escape extreme violence in Rakhine State of Myanmar, which caused the total number of Forcibly Displaced Myanmar National (FDMN) in the district to be about 923,033[2]. This huge number of displaced population account for about one-third of the total population of Cox's bazar, a district which was already facing many development challenges and suffering from resource-constrained social service delivery system even before the crisis evolved and the mass exodus of FDMN has worsened the situation further. Almost all of these displaced people are hosted in Ukhiya and Teknaf Upazila of Cox's Bazar, in extremely congested settlements in areas having very minimal access to basic infrastructure and services and is prone to natural disasters. The Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP) has been designed in order to reduce the vulnerability of Forcibly Displaced Myanmar National (FDMN) along with people from the host communities in Teknaf and Ukhiya Upazila under Cox's Bazar District, to different disasters and improve the social service delivery system and disaster resilience to both the communities. This project will follow a sustainable development pathway that is resilient to disaster and climate change effects.

The objective of the Project is to provide greater protection for the FDMN and host communities through:

- Reducing the vulnerability to natural disasters
- Improving social service delivery system and providing better communication facility through physical interventions
- Improving water and sanitation facilities
- Reducing vulnerability to accidental fire
- Provisioning better educational facilities and
- Strengthening and scaling up of GBV prevention services to the FDMN

The project is jointly being implemented by Local Government Engineering Department (LGED), Department of Public Health Engineering (DPHE) and Ministry of Disaster Management and Relief (MoDMR) under their respective mandate and scope of works. Apart from the interventions in Addressing Gender and Social Inclusiveness and Preventing Gender Based Violence with the Support from UNFPA and building Communication and Awareness among all affected parties through an effective engagement of BCCP (Bangladesh Center for Communication Programs) in the areas, LGED is implementing a good number of infrastructural facilities, namely improvement of hat bazars, roads (both inside and outside of the camps), bridges, culverts, construction of School cum multi-purpose disaster shelters, Satellite Fire Stations, Relief Distribution Center, Community Service Center and many other different types of facilities. Given the project interventions, sensitivity of the areas and volume of people in or around the sites, the project is more likely to trigger certain Operational Policies and Bank Procedures, namely Environmental Assessment (OP/BP 4.01), Natural Habitat (OP/BP 4.04), Forest (OP/BP 4.36) and Physical Cultural Resources (OP /BP 4.11).

[1] ISCG: Situation Report Rohingya Refugee Crisis, (September 27, 2018)

[2] IOM Needs and Population Monitoring round 12 as of October 10, 2018

1.2 Elementary information of Work Package Component of W23.13

It is imperative to recognize proposed components under Work Package-23.12 in Ukhiya Upazila in order to assess and verify its interventions according to stipulated screening requisites from WB. Acknowledging this matter, such details are accounted for as given below in Table 1.2.1 along with visual presentation (General Upazila Map) given in Figure 1.2.1. Aerial map for this component is given in Appendix -5.

Table 0-1.2.1: Basic Featured Information of components [Sources of data: Field survey, 2020: DDC & LGED]

Component's name under W-23	GPS Coordinates	Distance from Upazila HQ	Union	Ward	Project Influence areas locations	Pre-existing condition of Road	Proposed Road type	Road dimension(m) (Length X Width) = Footprint (sq.m) *
Mohasen ali to baggona Road Id:422945078	**Starting Point** 21.25301^0 N 92.11275^0 E **Ending Point** 21.25691^0 N 92.105545^0 E	2km	Rajapalong	3 & 1	Baganer Pahar, West Horinmara, Motsobaliguna, Gatipara	Partly Broken BFS and Partly Earthen	Bituminous Carpeting (BC)	(1405mX 4.9m) = 6,884.5 sq. m

*Note: Roads are proposed to have average carriage way of 3.7m with 0.6m shoulder on each side; special conditions may prompt further adjustments while in construction period. However, footprint for roads is calculated with an average of 4.9 meters.

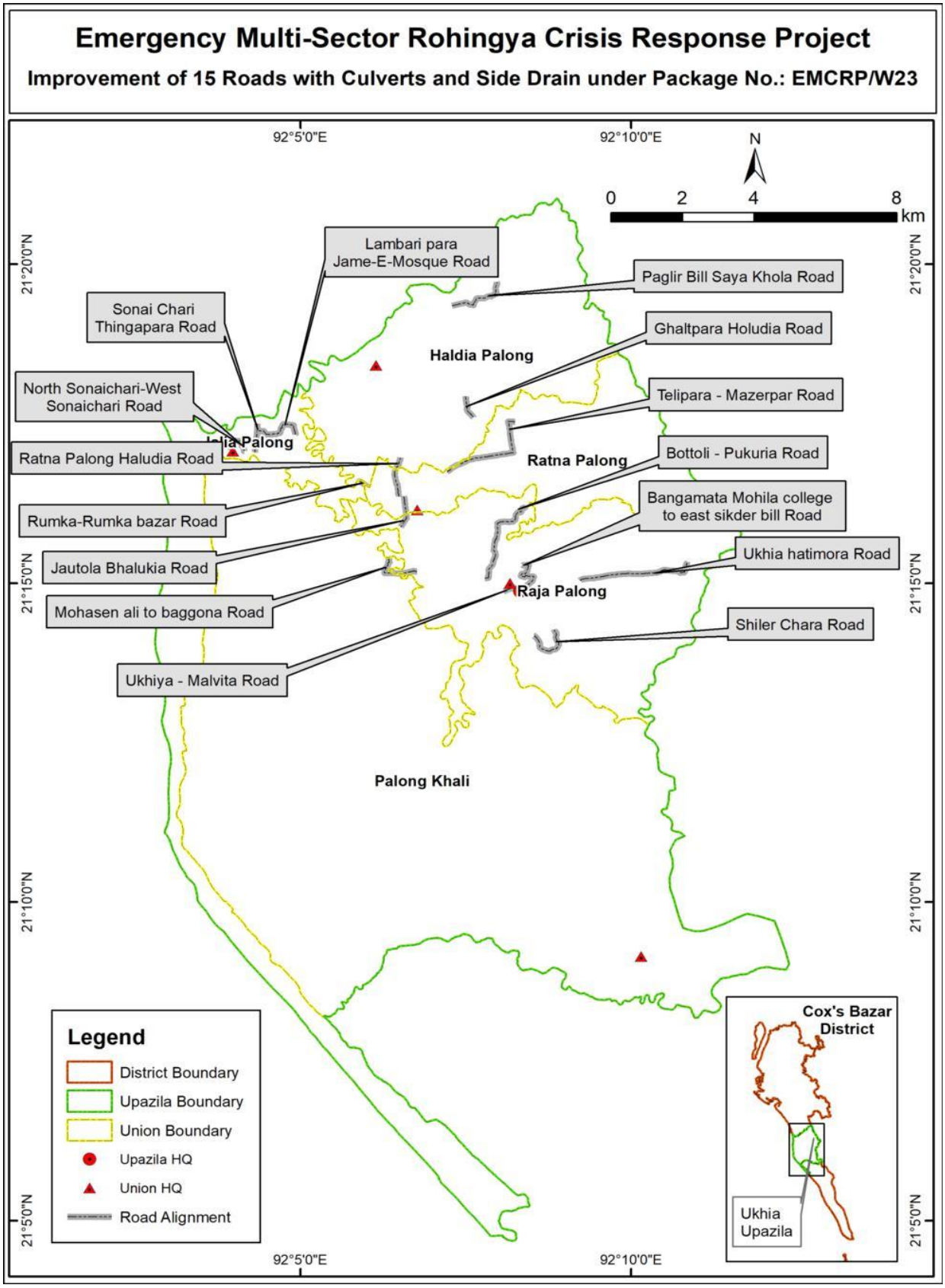


Figure 1.2.1: Map illustrating Mohasen ali to baggona Road Id:422945078 location in the Ukhiya Upazila

1.3 Proposed intervention items for this component

The Mohasen Ali to baggona Road Id: 422945078 (W23/13) under work package W23 have been proposed with specific need basis dimensions to accommodate and ensure best quality interventions for local stakeholders. In context of governing environmental circumstances and geo-meteorological conditions, protection work items have been added to construction design for safety and sustainability of each proposed roads. These roads are abutting agriculture hence, construction and improvement works will descent these roads into new circumstances in some parts. These items have been included on the basis of field survey and analysis of these conditions. Please follow the table to acknowledge these items.

Table 1.3.1: Proposed safety interventions of component

W23-13: Mohasen ali to baggona Road Id:422945078
02 nos. Cross Drain (dimension: 0.975mX 0.975m) at Ch. 924, Ch. 1078 and **03 nos. Cross Drain** (dimension: 0.750mX 0.750m) at Ch. 110m, Ch. 313m, Ch.431m, and **04 nos. RCC Box Culverts** (dimension: 2.0mX2.0m) at Ch. 243m, Ch. 530m, Ch.710m, Ch.1278m, **RCC U-Drain** (.450mX.450m), (.600mX.600m), (.750mX.750m), **429.0m L-Drain** at different chainage, and **91.0m Toe wall**(1.5 height) and **960m RCC Palisading (brick) work**, **135.0m brick Toe wall**(2.0 and 2.5 height)and **RCC Retaining wall** (24m length X 3.0m height). **Road safety** work and **Environmental Mitigation and Enhancement** works are also included. Description of safety works and environmental enhancement works can be found in BOQ attached in Appendix-03.

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS

2.1 Methodology

Public participation and community consultation have been taken up as an integral part of environmental assessment process of the project. As part of the impact assessment, participatory public consultation was conducted in areas of concern for proposed roads by the field level staffs and consultants from PIU and D&SC. The consultation meeting was attended by disparate social groups representing local habitants, separate age groups, social class and occupations. In some cases, IUCN employees in charge of elephant watch tower were present where frequent elephant movements occur. The participants were also selected from different segments of stakeholders, and some of whom will have major active roles before, during and even after the construction works. Therefore, the meeting was organized in an informed, expressive and unbiased manner, wherefrom different views and concerns came across which will be properly taken care of during the design and construction phases. In order to serve our screening process, relevant items were thrown towards the audience to discuss and troubleshoot confusing or worrying matters regarding the proposed intervention under package work. Impacts in regards to environment, socio-economic matters during pre-construction, construction and post construction phase have been put forth. Possible mitigation measures and relevant needs have turned out during these sessions as well. Moreover, their comprehension as a stakeholder has been up lifted in light of project guidelines.

However, public consultation is a living process as the types of problems/ difficulties, involved parties or stakeholders and mode of settlement or resolution processes are more likely to differ with time. Thus, consultation with different parties or stakeholders will be continued throughout the sub-project implementation period and records of resolutions, whatsoever and wherever possible, will be kept in writing at the site and made available on any enquiries or requests by all parties concerned.

Most of the possible impacts under this component development have been put through review for locating impediments or possible adversity effecting future environment and socio-economic conditions. In order to comprehend surrounding features and impacts which may stipulate with it, screening has acknowledged having a Project Influence Area (PIA) of 0.5-kilometer radius. Sensitive findings have been identified if any, and relevant mitigation or minimization measures were suggested to subdue such complication for over the project construciton period. Moreover, evaluation was inspired to enhance environmental features and include monitoring initiatives under ESMP budget to ensure exertion of environmental improvement propositions. Contractor's responsibility has been taken into account while identifying possible impacts through sets of intervention accounts. These steps have been initiated strictly following ESMF guidelines and requirements. Environmental screening procedure was motivated by ingredients highlighted in Appendix-2 of ESMF. During survey, detail chainage length of the sub-projects was taken into account for detailing environmental and socio-cultural features within 100 meters buffer zone of both Left and Right side from the center line of the road. Longitudinal intervals of 300 meters have helped to identify positions of sensitive or near-sensitive socio-cutural features. These findings are illustrated in **Annexure-01**.

2.2 Important features/establishments within the PIA

Initial screening process is conducted through direct involvement of PIU and D&SC in the influence area of the proposed component, which allows to raise significant questions and ideas towards participants. In combination of both field walk-through and inputs of audience, a register of existing features is formed. Allow the following table to describe such elements in all the work package components.

Table 2.2.1: Important features within Project Influence Area for W23.13

Component's name under W-23	Direction	Important features/ establishment (approx. distance from the proposed site)
Mohasen ali to baggona Road Id:422945078	North	Horinmara Nalkup Guna Mosque/ Madrassa(20m), Community Clinic(10m), Mohasen Ali GPS (20m), Moshrof Ali Guna Jame Mosque(500m), Households(20m)
	South	South Horinmara Mosque(50m), West Horinmara Mosque(500m)
	East	Tuturer Beel (1km)
	West	West Tuturer Beel Mosque/Hefzokhana/ Graveyard (50m), West Horinmara Mosque(1km), Ghatirpara Mosque/Graveyard(1km)

2.3 Issues and Recommendations raised by the Participants

After inauguration has set in motion, their valuable opinions and remarks came pouring out. At this point, we find our field base knowledge for assessment attributed impact degrees and possibilities. Please follow the table 2.3.1 given below to recognize participants' inputs arranged in relevance with this component. Consultation meeting summary, attendance sheets and pictures of separate meetings with proposed location for this subproject component can be found in Table 2.3.2 and Annexure-02 and Annexure-03 respectively.

Table 2.3.1: Issues and Recommendations raised by the Participants

COMPONENT'S NAME UNDER W-23.13	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
MOHASEN ALI TO BAGGONA ROAD ID:422945078	• In Baganer Pahar, West Horinmara, Motsobaliguna, Gatipara area, this proposed road is previously HBB developed. However, this road has earthen condition in last half portion of the road. They feel this improvement with BC is highly needed for them to ensure quality road for better communication facility. • Big vehicles cannot use this road due to having short crest. In some portion no transport can pass. •Possible dust and noise pollution during the construction works. •Safety of children and adults at the sites during construction works. •Elephant movement not present. • In some parts of the road, soil and tree clearing will be needed to make way. •Local community wish to have a better drainage system along with the road in order to allow waters from higher grounds to find an uninterrupted pathway not causing harm to nearby households or agriculture fields and wash away top soil of adjacent grounds residing alongside the road. It will protect the top soil for future growth of crops and aid vegetable farming or homestead gardens. Abutting the road, the chainage consists of homestead gardens. These features should not be disturbed in	• Local people considered that the selected site is suitable for the construction of this road from both the technical and social-environmental (Direct savings in the cost of operating vehicles, time savings by travelers and freight, wider effects can less accident rates, this road is waterproof and also dust free, much more durable) point of view. It will provide better mobility and access to services in due time. •The road should consider water flow during rainy seasons thereby ensuring the construction is not affected by mass water flow. •Enough pathway is expected for vehicle movement so that comfort travel is achieved. •Construction site safety should be ensured to avoid any mishaps or accidents during work periods. •They considered small lumbering and suggested tree plantation initiatives. •They also requested to involve the local community to construction work and they will welcome any outside key labor. •During construction period, alternate route to pass through this area is available. •Since the road is passing alongside homestead gardens and agriculture fields, the intervention will invite air pollution on moderate level during construction period. However, preventive actions and measures can be taken to keep air quality from degrading. • Women should be recruited equally, wherever possible. •Participants, made certain that they will provide surveillance over raw materials and material storage area. •They have also ascertained that the selected site is free from any events related to resettlement and

COMPONENT'S NAME UNDER W-23.13	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
	construction period. •The participants have expressed their greater interest for this intervention and believes this will bring nothing but prosperity for the entire catchment dwellers. •Household fences along the road should not be affected while construction • No trees should be harmed for preparation of this road • Available pathway to usher material delivering vehicles • Labor shed availability in the target location • Material storage is available.	major environmental impacts. The adverse environmental impacts that may come in the way of air quality, noise, solid waste, occupational health & safety during the construction period, and will be of short duration, yet proper management/conservative options should be adopted. • Open spaces are available along the road which can be used for material storage and labor camp. • Horinmara road is available as connecting road for material delivery. • Electricity is available and contractor can install tube wells as deemed necessary.

Table 2.3.2: Consultation Meetings Summary

Road Package Number	Date DD-MM-YYYY	Venue	Main Participant Groups	No. of Participants	Remarks (If any)
W23-13	08-10-2020	Shop of Alamgir Showdagor, Horinmara	Host Community	25	-

3. ENVIRONMENTAL SCREENING

3.1 General

This section identifies the potential impacts that the various elements of the proposed Project may have on the physical, biological and socio-economic environment within half a kilometer of the radial distance around the site. Environmental Assessment (EA) based on this screening study for the Sub-project has been conducted to identify and determine which potential Project impacts may be significant and therefore require the application of reasonable and effective management and/or mitigation measures.

In order to realize the exact physical, biological, socio-economic and environmental impacts of the proposed sub-project sites and the influence area in regards to the implementation measures, an extensive field visit was carried out in each proposed sub-project PIA. Environmental Screening form, as adopted in **Appendix 2** of the Environmental and Social Management Framework of EMCRP, was administered for identifying the impacts and their extents.

The screening data and information for this subproject component and details screening summary have been formulated and shown in **Appendix-01.**

3.2 Major Findings

A complete view of current environmental conditions of individual sub-projects in relation to interested queries has been congregated in order to understand the degree of impacts corresponding with marked interventions. Interestingly, most sub-project has correspondence with its surrounding features and upholds interchangeable impacts. However, the degree is not an interchangeable factor since scale is not parallel to each of these components which is where, mitigation measure differentiation is implied. There are some cases where unique circumstances have been met with while environmental screening took place which is also accounted for and should be a matter of concern for other parts of the ESMF initiative. The significant issues observed for this subproject component is enlisted in following Table 3.2.1 with pertaining impacts. Moreover, impacts that are adventitious has also been embraced for promoting best practices.

Table 3.2.1: Concerning environmental issues relating to each proposed subproject and influence area for W23.13

COMPONENT'S NAME UNDER W-23.13	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
MOHASEN ALI TO BAGGONA ROAD ID:422945078	It is not located within any major environmentally sensitive area.	It will not cause any severe negative effects to the environmental settings of the area neither to important environmental features.
	Construction period will induce air pollution while preparing for bitumen and loading-unloading raw materials. Impacts on air quality during the construction phase may turn to negative. The main impacts include dust generation from crushers, vehicles and the transportation of all types of construction materials.	It will invite waste production which may in turn cause minor air pollution due to deposited dust and airborne particles less than PM_{10}. Dust pollution may slightly suffocate photosynthesis however this can be minimized through regular water sprinkling as suggested in ESMP.
	Noise emission from construction machineries and equipment can cause nuisance to local residents and workers.	The ambient noise level might have potential to increase temporarily and intermittently in the close vicinity of active construction fronts.
	No agriculture, fish farming and significant vegetation coverage is located in the ROW nor does it stand over such items. Nonetheless agriculture fields and homestead gardens/forest are found beside the road.	No agriculture land or any forest coverage will get degraded or lost for construction. Liquid waste such as left-over oils or chemicals might run into these adjacent features.
	Construction works will involve chemical usage and preparation of on-site add-ons to the road. Generating scraps and residues.	The runoff from work site may enter existing pond and frustrate the water quality which will be acute however.
	Few amounts of bush (sapling) will be cut down during construction phase at different chainage.	No severe damage will occur or damage to habitat will be faced. It can be managed by introducing small plantation incentives around the proposed location.
	Elephant Movement is not present in the vicinity of the subproject location.	No impact is expected
	No heavy earth excavation work will be involved.	Consequently air, noise and dust pollution will

COMPONENT'S NAME UNDER W-23.13	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
		be occurred within a small-scale during construction period only.
	Construction related activities and setting up of labor camps along with associated facilities and their management can cause adverse impacts.	Noise pollution from pilling or drilling, air pollution caused by dust or gaseous emissions from vehicle movement, running of motorized equipment and land clearing, odors and soil pollution from leaking of latrines and fecal sludge, will more likely to take place.
	Chemical spills or improper disposal of construction waste materials due to lack of worker training and misconduct of contractor's safety initiatives.	During the construction period, soil may get contaminated from activities such as handling of hazardous construction materials (such as fuel, lubricants, paints, and solid waste and sewage).
	Vibration effects generated from pilling, drilling or other construction works	Any vibration would result in nuisance effects to nearby faunal species, and but will be localized and temporary and will unlikely to result in structural damages to buildings or walls of the adjacent private properties.
	Sensitive environmental, cultural, archaeological, religious sites within 1 kilometer of site includes including Horinmara Nalkup Guna Mosque/ Madrassa(20m), Community Clinic(10m), Mohasen Ali GPS (20m), Moshrof Ali Guna Jame Mosque(500m), Households(20m) to the North. South Horinmara Mosque (50m), West Horinmara Mosque (500m) to the south. Tuturer Beel (1km) to the east and West Tuturer Beel Mosque/Hefzokhana/ Graveyard (50m), West Horinmara Mosque(1km), Ghatirpara Mosque/Graveyard(1km) to the west.	No disturbance to all these establishments/features is anticipated due to construction activities for the sufficient distance from the construction site, and strict construction site management system-including restrictive work schedule during the daytime only, water-sprinkling twice a day on and around the site, safe storage of materials, etc.

A few incidents of human elephant conflict have been reported in 2018. The IUCN has conducted a study on such conflict. With the support from UNHCR, IUCN has been marking elephant routs and corridors and informing local communities and stakeholders of avoiding the marked areas. As part of the mitigation options, different initiatives have been undertaken, such as formation and capacity development of Elephant Response Teams (ERTs); providing equipment to ERTs to divert in-coming elephants; and setting up elephant deterrent tools (e.g. trip alarms and watch-towers). Though the current chances of occurrence of conflicting incidence are zero, any recurrence would be managed by the ERTs and they will be called if there appears any minute possibility to recur. A map of elephant movement is given in Annexure 04.

In order to offset the loss or attenuating the environmental degradation, a set of mitigation measures will be adopted, on top of general practice of standard construction procedure or following the relevant codes of practices.

3.3 Climate Change Impact Screening

3.3.1 General Overview of the area

Cox's Bazar is one of the coastal districts of Bangladesh and is prone to the effects of climate change due to its geomorphological siting and climate induced effects. The hilly tracts of Cox's Bazar could foster further environmental crisis brought on by indiscriminate deforestation and diminishing groundwater reservoirs, which have been taken place in recent months as the Rohingya crisis evolved. A recent study conducted by World Bank[3] has found that Cox's Bazar will be the worst-hit district in South Asia as average temperatures rise and rainfall patterns become disruptive, by 2050, if greenhouse gas emissions continue unabated.

The hilly region of the country, especially the part in Cox's Bazar is characteristically of muddy soil structure, not of any rocky formation and the stability comes from the roots of the trees. Also rainfall, proximity to the sea, elevation, and land cover are very important factors for analyzing the risk of cyclone. Denudation of trees from hilltops in order for the huge settlement of Rohingya people has already increased the vulnerability to the risk of hill collapse by destabilizing the terrain. Also deforestation at a rapid speed uncovers the land and raise the risk of occurrence of cyclones, as forests protect land from high wind and storm surges where demolishing the trees would make the area vulnerable.

Together with the above-mentioned hazardous situation, again due to sudden extraction of huge amount of groundwater, availability of potable water from shallow tube wells that pump water up from about 150 feet has already reached to a critical level. Averting the problem requires new tube wells to be plumbing deeper into the poorly mapped aquifer, but going deeper than 700 feet in some places may cause salt water to contaminate freshwater resources.

In this case, it is possible that a stationary position of the freshwater-saltwater transition zone can be established via proper management of pumping in the confined aquifer.

The groundwater resource is seen to suffer more from the climate change impact. The impact on groundwater due to climate change impact include

- Sea-level rise could result in a transgression of the sea and a loss of land area. This could also lead to the secondary effect of population migration in the new coastal band due to migration of the coastal population from the encroaching sea, thereby increasing domestic water needs in the new coastal area.

- Transgression of the coast implies that saline storm surges of 1 or more meters depth would penetrate beyond the new coast to new land areas. Storm surges transport saline water far inland of the coast and much of this floodwater may infiltrate the ground in areas where the aquifer is not fully saturated. Even where the aquifer is saturated, denser saline water may

[3] https://openknowledge.worldbank.org/bitstream/handle/10986/28723/9781464811555.pdf

sink into the aquifer during the flood and later from pools of saltwater that remain following the flood[4].

- It has been identified that the salinity is found in the shallow aquifers along the coastline. So the salinity which are found in the groundwater are of lesser concern as salinity will subside over time

- Several researches show that through modeling of groundwater flow that the depletion of groundwater in the host community will persist up until 2022 and the replenishment of water will take place.

Considering the general climate change effects in Cox's Bazar area and offsetting the aggravating environmental situation due to the mass arrival of Rohingya communities, several specific measures including tree planation in sub-project areas, rainwater harvesting from every disaster shelter, construction of drainage facilities along the road length and installing thunder arrester across the areas, have been suggested and will be implemented.

3.3.2 Site Specific Screening and outcome

Climate Change impact on a particular subproject is tough to deduce as the highest resolution of climate model simulation done over Bangladesh is 50km. Depending on the simulation ensemble of Cox's Bazar district, the temperature and precipitation are likely to increase with time.

Site specific climate change impacts are often not so easy to measure or deduce plausibly while the site is confined to a narrow strip of roadways, and associated mitigation or offsetting measures are really hard to plot on the impact areas, though an overall set of measures are often considered in practical aspect. Fig:1 shows the inundation risk map of the subprojects under W-23, none of the subprojects are in vicinity of the severe river flood inundation area. So the risk of flooding is low around the sub-project area

[4] "Implications of Climate Change for Fresh Groundwater Resources in Coastal Aquifers in Bangladesh", World Bank report.2010

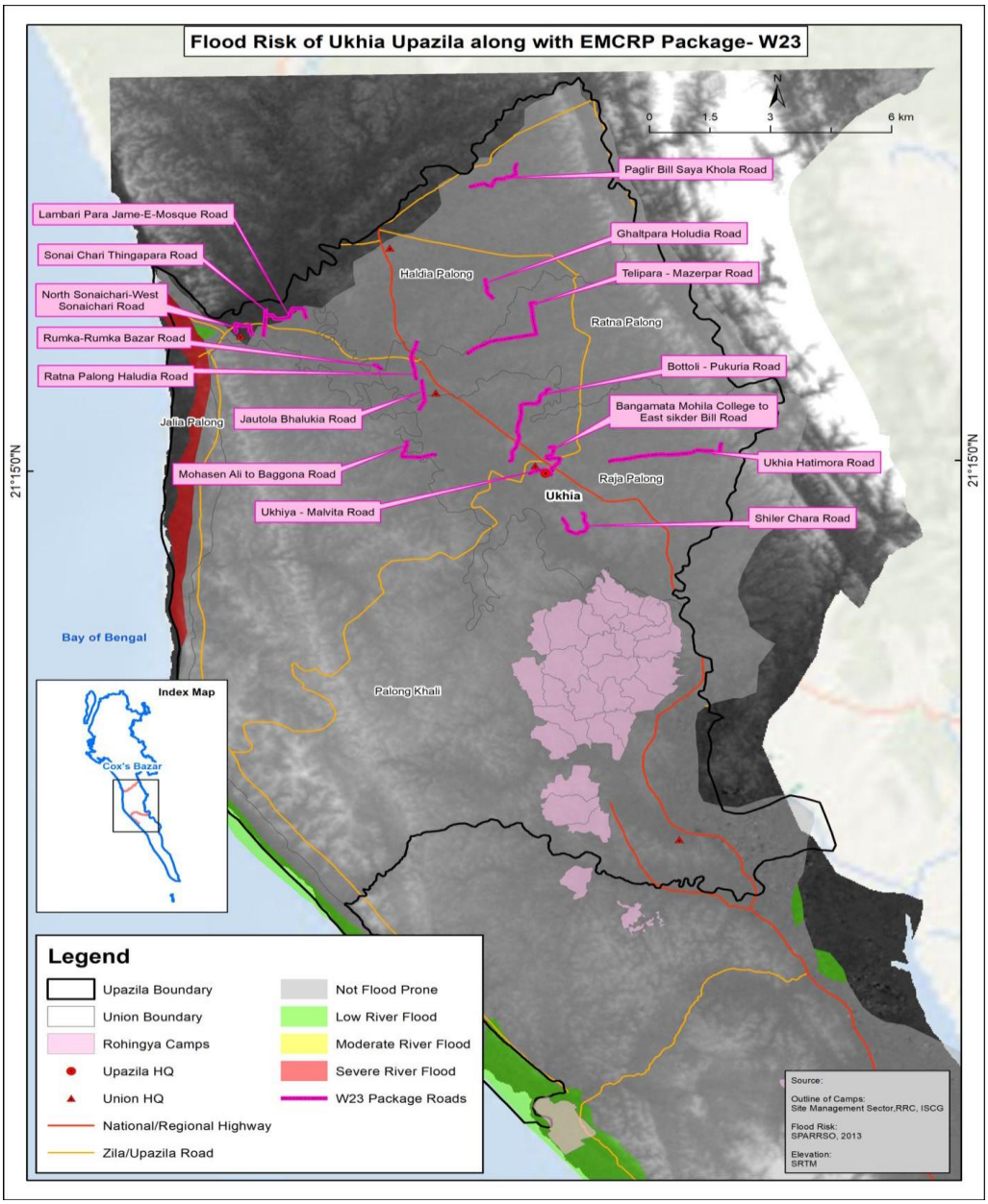


Figure 3.3.2.1: Flood inundation risk map near the subprojects.

Also, in order to avoid the devastation caused by the thunderstorm, state-of the-art thunder arrester (lightning protection system) has been suggested to install having a coverage area of 25,434 sq.m for a single arrester. In addition, tree planation on the road slope/ within the premises is also suggested to sooth the temperature effect and increase the water retaining capacity of soil, at the same time.

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

4.1 General

Considering the environmental settings of the sub-project area, it can be assumed that possible impacts would be largely construction-related, and could be addressed through adoption of good engineering practices; good housekeeping; better *in-situ* construction materials management; and observance of health and safety protocols during the implementation period.

Table 4.1.1: Site Specific Impact and Mitigation Plan under package W23.13

Component's name under W-23.13	Impacts	Mitigation plan
Mohasen ali to baggona Road Id:422945078	To the north Horinmara Nalkup Guna Mosque/ Madrassa(20m), Community Clinic(10m), Mohasen Ali GPS (20m). To the south, South Horinmara Mosque (50m) and to the west there is West Tuturer Beel Mosque/Hefzokhana/ Graveyard (50m). There are settlements as shops and households are located adjacent to the sub-project which can be subject to air pollution. However, none are on the ROW.	Contractor must adhere to the best practice debris management procedure and regular adoption of dust control measures (spraying of water at least twice a day) to minimize the effect to the level best.
	Some part of the proposed road is passing by the agricultural land. **Box culvert** and **cross drain** will be constructed to terminate rainwater for one side to another side during rainy season and also help for rapidly remove excess soil water to reduce or eliminate waterlogging during monsoon and return soils to their natural field capacity and will help to maintain the water balance of both roadside agricultural land to provide a sustainable irrigated agricultural system. It will also help to prevent flood and not to allow water to overflow and also help to divert water for farming. Some high land is found beside the road. So, **L-Drain** will be constructed for drainage high land eel water during rainy season. **U-drain** is also considered for drainage facility that runs along the road for uninterrupted water flow. Some low land is found beside the proposed road so **protection wall** and **palisading work** will be constructed during construction period for used to "correct" the natural slope. There are points on the road where slope preparation cannot be done due to having low lying agriculture lands and water bodies. Slope preparation refers to resettlement issues as well in those locations. In such cases **Toe Wall** is proposed which helps to restrain the horizontal surface pressure. This is an adaptation technique and a precaution measure to not allow any damage to sideline existing low-lying features. There are low lands along the road where agriculture fields and ponds are present. This also excludes high chance of soil quality degradation. Some high land is found beside the road where **Retaining wall** will be constructed to avoid landslips and soil erosion.	**02 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 924, Ch. 1078 and **03 nos. Cross Drain** (dimension: 0.750mX 0.750m) at Ch. 110m, Ch. 313m, Ch.431m, and **04 nos. RCC Box Culverts** (dimension: 2.0mX2.0m) at Ch. 243m, Ch. 530m, Ch.710m, Ch.1278m, **RCC U-Drain** (.450mX.450m), (.600mX.600m), (.750mX.750m), **429.0m L-Drain** at different chainage, and **91.0m Toe wall**(1.5 height) and **960m RCC Palisading (brick) work**, **135.0m brick Toe wall**(2.0 and 2.5 height)and **RCC Retaining wall** (24m length X 3.0m height). **Road safety** work and **Environmental Mitigation and Enhancement** works are also included.

Further construction related activities which may result in adverse impacts in the surrounding environment of the sub project component must be kept under close consideration and appropriate mitigation and management measures will be taken with due care and vigilance. Once the effects are minimized to its least level and controlled efficiently, it will turn into a welcoming and beneficial project for the local communities. The component specific environmental management plans have been outlined in **Appendix-2**. The mitigation measures as well as monitoring program of ESMP have also been incorporated in the management plan.

Environmental quality enhancement: Under the additional financing to the EMCRP project, Forest Department of the Government of Bangladesh will afforest along 200 km of road length area, primarily under the Ukhiya and Teknaf Upazila of Cox's Bazar district in order to offset the environmental and ecological devastation, that had been occurred due to the evolution of Rohingya Crisis, to an achievable level. Many of these road lengths will go through and by the Rohingya Camps, up on the hill and are already denuded of trees or vegetation. Local Government Engineering Department (LGED) will allocate and channelize the finance to the Forest Department under the said additional financing component and oversee the progress of works with due diligence. However, this enhancement work will improve the environmental quality of the area and reinstate some parts of the ecosystem services to those areas, though primarily.

4.2 Health and Safety Measure under COVID Situation

Apart from the established Occupational Health and Safety (OHS) measures being followed in construction sites, offices, and labor camps, a set of additional measures has to be taken and practiced throughout the daily cycle by each labor, staff and any involved parties, due to the ongoing pandemic coronavirus situation. Staffs and consultants at PIU and D&S, along with the pool of consultants under different firms/agencies for different services, and all the representatives or staffs of construction contractors and suppliers have to play much sensitive, (pro-) active and responsible roles in abiding by the rules and measures by themselves and getting the involved workers and different stakeholders adhered to the same. A detailed guideline containing a set of measures with shared responsibilities has been sketched out in order to fight the exposure and further spread of this potentially fatal situation. This plan or guideline shall constitute an integral part of ESMP measures for every sub-project, though is not included in this report to keep it concise and specific, and the contractor is required to keep the copy of that guideline at every site office.

However, among many other relevant issues, the guidelines emphasize on following line of directives:

a. Contractor must designate one of his employees as H&S/Safeguards supervisor to lead, coordinate and interface in order to fight the COVID 19 situation under the direct guidance of COVID focal at PIU of EMCRP project.
b. All workers, supervising and supporting engineers and staffs, consultants, service providers and other concerned parties must adhere to the personal health and hygiene rules, social distancing, and other protective measures in full in order to protect themselves and contain the infections any further. Necessary training and awareness campaign will be aligned with the specific sub-project scenario and prevailing conditions.

c. General practice of cleaning and hygiene has to be maintained in all project/site offices and camp sites, and supply of necessary PPEs and cleaning /disinfecting materials along with proper use of those is to be ensured.
d. Public consultation and stakeholder engagement are to be carried out considering the prevailing risks of virus transmission in the target areas, scope of interventions and level of ICT penetrations among the target stakeholders, and so on.
e. Necessary protocols have to be established and maintained in case of handling a sick employee or worker, and appropriate compensation to a sick disengaged labor is required to be given with due documentation.
f. Budgeting for suggested protective measures, along with necessary supervision and monitoring for the required interventions has to be ensured.

Following the additional health and safety measures presented in that guideline, sub-project component specific BOQ items have been inserted to supplement the budget considering the country-specific situation, capacities, and scope of interventions. The additional cost to Health and Safety Measures under COVID 19 situation is shown in **Appendix-3.**

4.3 Cost of Environmental Enhancement Works in BOQ

In consideration to the above-mentioned environmental impacts and their mitigation measures for this sub-project component, a set of items are included in the BOQ of this sub-project component. Social Safeguard Personnel for Environmental and Social Management for Work Package EMCRP/W23 has also been added in the whole BOQ in order to take supervision and leadership to organize Environmental Management under Environmental Enhancement Works. The total costing and estimation have included enhancements such as Grass turfing plans, Tree plantation initiatives, Dust Suppression mechanisms. On the other hand, in order to ensure health safety and sanitary measures of workers PPE, First Aid Box, Labor shed, Environmental management, drinking water facility with water tests, Temporary latrine for both male and female as well as waste disposal systems has been accounted for. Ensuring sustainable labor performance in regards to environmental and social considerations motivational training has been taken into account. An overview of the estimation is given below and the detailed estimated cost to implement the ESMP is shown in **Appendix-3**.

5. LIMITATION OF THIS STUDY

Bangladesh government has imposed a nationwide lockdown to curb the spread of the novel coronavirus in the wake of series of deaths and infections. Authorities declared a ban on passenger travel on all sector from March 24 while all public transport on roads have been suspended from March 26 to stem the spread of virus, officially known as COVID-19. All office works have been postponed and an intended visit to the sites for further consultation with the relevant stakeholders has had to cancel due to this crisis. Therefore, some relevant information and arrangement needs waiting for recovering this pandemic crisis.

6. CONCLUSION AND RECOMMENDATIONS

The overall conclusion is that if the mitigation, compensation and enhancement measures are implemented in full, there will be no significant negative environmental impacts in regards to the selection of location, design, construction, and/or operation procedure of the proposed component. There will in fact be tremendous benefits from recommended mitigation and enhancement

measures and major improvements in quality of life, opportunities in business, trading jobs and ensuring social safety and security will be achieved once the scheme is in operation.

The conclusions of the Screening study can be summarized as follows:

- The communities will receive large benefits through improved infrastructural facilities, transportation & communication etc.
- The short-term negative impacts that may come by the way of air quality, noise, solid waste, occupational health & safety need to be minimized through the management plan.
- The project will create employment for those who live in the vicinity of the construction site and will provide them a short-term economic gain.
- The green belt development, if necessary, for the road site, with large-growing trees at the periphery of the site will give the places a more natural and pleasing appearance.
- A comprehensive Environmental and Social Management Plan (ESMP) has been prepared to mitigate and reduce the adverse impacts that will come out from the Subproject activities.

Implementation of this component will have large positive impacts to the communities in terms of improved infrastructural transportation & communication facilities, which would eventually develop the socio-economic condition of the catchment areas. So, strong recommendation should be put in place to implement the sub-project within shortest possible period of time, and with great care and efficiency.

Annexure-01: Important Environmental Features (IEFs) near site

Detail Environmental features within 100m of the both sides from the center line were collected @300m longitudinal intervals. The findings of the survey for the aforementioned road can be seen in the table below:

Table: Detailed Chainage length and features of the Sub-Project component

Road Name	Mohasen ali to baggona Road Id:422945078 **(W23-13)**		**Total Chainage**	1405.0m
Chainage (m)	**Left**	**Right**	**Features**	
000-300	L		Bridge over horinmara khaal, crop field, settlement, household, crop field, household connecting road to the left, bamboo fence, tin fence, open space, culvert, shop, open space, shop, household connecting road to the left	
		R	Horinmara khal, Mosque, Jackfruit tree, pond, bamboo fence, trees, bush, tin fence, open field, household connecting road to the right, household, bamboo trees, earthen drain, household connecting road to the right	
300-600	L		High grounds, settlement and trees on high grounds, bush, trees, high ground, households, tin fence, bamboo fence, settlement, trees, high ground, settlement, households, open space, crop field, drain, household connecting road to the left, crop field	
		R	Rajapalong Mohsen GPS, High ground, bamboo fence, shop, household connecting road to the right, trees, electric pole, households, bamboo fence, drain, household connecting road to the right, brick wall, crop field, brick wall, crop field	
600-900	L		Crop field, tree, crop field, crop field, electric pole, (the riad turned right), crop field,	
		R	Cross drain, crop field, crop field, crop field,	
900-1200	L		Crop field, Electric pole, high ground, trees, high ground, trees, bamboo fence, households, electric pole, tree garden (Mehgoni tree), crop field	
		R	Electric Pole, Crop field, High ground, settlement, household, trees, shop, gunny bag protection, bamboo fence, vegetable yard, bamboo fence, tree garden, bamboo fence, betel leaf baraz	
1200-1405	L		Bush, vegetable yard, banana trees, garden, bamboo fence, nut tree garden, open field, tuturubil khal, bridge, crop field, electric pole, open space	
		R	Vegetable yard, electric pole, household, household connecting road to the right, open field, electric pole, bridge, bush, bamboo bush, bamboo fence, shop	

Annexure-02: Attendance of consultation meetings for W23/13

EMCRP/W23.13

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)

জরুরী ভিত্তিতে রোহিঙ্গা সংকট মোকাবেলায় বহুমুখী সেক্টর প্রকল্প

Local Government Engineering Department (LGED)

Public Consultation Participants List

Focus Group Discussion

সময়: 04:03 PM তারিখ: 08/10/2020

উপ-প্রকল্প/আলোচনার এর নাম: Mohasen Ali to Baggona Road

যে স্থানের নাম: Shop of Alamgir Soudagar, Horinmara

ইউনিয়ন: Rajapalong ওয়ার্ড নং: 03 মৌজা: Ukhiya উপজেলা: Ukhiya জেলা: কক্সবাজার

প্রকল্প পাইপের নং: EMCRP/W23.13

অংশগ্রহণকারীদের তালিকা (পরিচয় ও স্বাক্ষর)

ক্রম নং	নাম	বয়স	পুরুষ/নারী	গ্রাম	স্বাক্ষর / টিপসই
০১	মোঃ সাহেরুদ্দাহার	৬৪	পুরুষ	হরিণমারা	
০২	মোঃ হারুন	৬৬	পুরুষ	,,	
০৩	মোঃ হুসাইন তালিব	২৮	,,	,,	
০৪	মোঃ রফি আলম	২৫	,,	,,	
০৫	মোঃ ইউনুছ আলী	৪৬	,,	,,	
০৬	মোঃ আলম	৪২	,,	,,	
০৭	জাহাঙ্গীর আলম	৪২	,,	,,	
০৮	মোঃ মোজাম্মেল হক্কানী	৫০	,,	হরিণমারা পশ্চিম	
০৯	মোঃ আলম	৫২	,,	,,	
১০	নুরুল ইসলাম	৫৫	,,	,,	
১১	ফরিদা বেগম	৩৫	নারী	বাজার পাহাড়	
১২	জাহাঙ্গীর আলম	৪৫	,,	পশ্চিম হরিণমারা	
১৩	মোঃ জামাল	২৮	,,	বাজারের পাহাড়	
১৪	মোঃ বাবুল	৩৫	,,	,,	
১৫	মোঃ আবুল কালাম	৩৫	,,	,,	
১৬	নুরুল আমিন	৩২	,,	,,	
১৭	নুরুল আলম	৩৫	,,	,,	

EMCRP/W23.13

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)

স্থানীয় সরকার প্রকৌশল অধিদপ্তর

Local Government Engineering Department (LGED)

Public Consultation Participants List

Focus Group Discussion

সময়: 04:03PM তারিখ: 08/10/2020

উপ-প্রকল্প/কার্যক্রমের নাম: Mohasen Ali to Baggora Road

যে স্থানে বসেছে: Shop of Akangir Soudagar, Horinmara

ইউনিয়ন: Rajapalong ওয়ার্ড নং: 03 মৌজা: Ukhiya উপজেলা: Ukhiya জেলা: কক্সবাজার

সাব প্রকল্প নং: EMCRP/W23·13

অংশগ্রহণকারীদের তালিকা (পরিচয় ও স্বাক্ষর)

ক্রম নং	নাম	বয়স	পুরুষ/মহিলা	গ্রাম	স্বাক্ষর / টিপসই
১৮	[illegible]	৩৫	পুরুষ	[illegible]	[illegible]
১৯	[illegible]	৩৫	ঐ	ঐ	[illegible]
২০	[illegible]	৩২	ঐ	ঐ	[illegible]
২১	[illegible]	৩০	ঐ	ঐ	[illegible]
২২	[illegible]	৪৫	ঐ	ঐ	[illegible]
২৩	[illegible]	২৫	ঐ	ঐ	[illegible]
২৪	[illegible]	৩৫	ঐ	ঐ	[illegible]
২৫	[illegible]	৩৭	ঐ	ঐ	[illegible]

Figure: Attendance of consultation meeting for W23-13

Annexure-03: Pictures of sub-project component location and surrounding features with public consultation



Figures: Present condition of Mohasen ali to baggona Road Id:422945078 (W23-13) & Public Consultation meeting with Host community

Appendix-1: Environmental Screening Form for examining sub-project component

Environmental Screening Form for Sub-project W23-13

Sub-Project Description Form:

EMCRP/W23- Improvement of 15 roads and construction of culverts with side drains under Cox's Bazar District

Name of Sub-Project: Mohasen ali to baggona Road Id:422945078

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Estimated total cost of sub-project (in Taka): 417,036,298.10 Tk.

Estimated construction period duration: 1 year

Estimated total cost of the component (in Taka): **35,165,356.76 Tk.**

Estimated Operation and Maintenance period (life of sub-project): Project design life more than 15 (Fifteen) years but Government policies on how long projects can operate in the camps.

District: Cox's Bazar **Sub-District**: Ukhiya **Union**: Rajapalong

Name of Community/Local Area: Baganer Pahar, West Horinmara, Motsobaliguna, Gatipara

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):

The Sub-Project is categorized as a village road-A with a proposed design of Bituminous Carpeting through construction of Earth Work. Interventions include **02 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 924, Ch. 1078 and 03 nos. **Cross Drain** (dimension: 0.750mX 0.750m) at Ch. 110m, Ch. 313m, Ch.431m, and 04 nos. **RCC Box Culverts** (dimension: 2.0mX2.0m) at Ch. 243m, Ch. 530m, Ch.710m, Ch.1278m, **RCC U-Drain** (.450mX.450m), (.600mX.600m), (.750mX.750m), **429.0m L-Drain** at different chainage, and **91.0m Toe wall** (1.5 height) and **960m RCC Palisading (brick) work, 135.0m brick Toe wall** (2.0 and 2.5 height) and **RCC Retaining wall** (24m length X 3.0m height). **Road safety** work and **Environmental Mitigation and Enhancement** works are also included. Road safety works are also included in the project activity.

Estimated footprint / land area for this sub-project is 6,884.5 sq. meter

Brief description of sub-project site: (e.g. present land use, Important Environmental Features (IEFs) near site, etc.:

Proposed road is situated within the catchment area of Baganer Pahar, West Horinmara, Motsobaliguna, Gatipara stretching 1405 meters. This road starts from Horinmara road and ended in tuturubeel sarak kobbartek. Being one of the local communities of Ukhia upazila these locations are very familiar to any other part of rural Bangladesh having mosques, village households, agriculture fields to grow crops and vegetation that serves as subsistent gardening. The surrounding area is dominated with agriculture practices as rice production, betel leaf production, vegetable farming etc. Majority of the surrounding space of this intervention is covered with homestead gardens and

forests. However, there are no significant eco-sensitive features on the pathway of this proposed road.

Overall Comments

The proposed component of the sub-project (Road construction) is not located within any remarkable environmentally sensitive area and will not cause any severe affect to the environmental settings of the area, thus not going to create intimidation to important environmental features. No drainage congestion/water loggings have been observed in the road area. But, some local trees like betel nut tree, rain tree, mango tree, bamboo bushes etc., or additional vegetation may need to clear out due to construction activities, with appropriate offsetting measures to be taken. No agricultural productive soil will be used for the purpose. Earth will be compacted for stabilization. The inputs will be mainly at construction phase and limited within project boundary. Moreover, mitigation measures will be taken according to the ESMP for minimizing the air, dust and noise pollution.

It has been revealed that this project's scopes of works do not intend to overtake their area of lodgment and funding entity has no intention to do so. Moreover, other issue has also been brought to their attention that drainage system and a bridge have also been included into the evaluation of this project since runoff from higher grounds are also a concerning matter during rainy season.

People of the subproject area are very much optimistic about the success of the project and are also eager to participate in the project activities. The subproject is environmentally sustainable and socially acceptable. The local community attended in the participatory public consultation meeting. Their community representatives as teachers, shop owners, farmers and elders have no objection to the construction this infrastructure in the proposed site; the community also appreciated the initiative of LGED to ensure safe access and better portability. The public consultation meeting results confirmed that improvement of this road will increase socio-economic interest in the communities and make lives easier for these people. They also requested to construct the road in accessible width so that small auto and motor vehicles can pass easily. On another matter, locals requested to involve the local community to construction works and material storage monitoring duties.

The road is not located within any identified environmentally sensitive area, and therefore, does not seem to cause any adverse impact on the important environmental features. No significant impact is expected on the ecosystem and biodiversity, no agricultural land/ activities or fish farming will be disturbed, due to the construction of the sub projects. Only forest is found as homestead forest on high grounds of the location.

Types of waste to be generated during construction and operation phase:

During construction period solid waste will be generated due to construction activities. The types of wastes are brick pit, unused sand, wood, gravels, bitumen etc. The types of wastes are gravel, stones, rock, wood, copper wires, concrete, iron, plastic etc. Negligible amount of plastic will come as residue. Moreover, liquid waste will include chemicals of bitumen leftovers, motor oils, used oil, Degreasing solvents etc. Human wastes and kitchen wastes will be generated from labor camps as well.

Sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site including elephant migration routes and remaining forests:

Within the influence area of the subproject no historical sites were identified. Sensitive environmental, cultural, archaeological, religious sites within 1 kilometer of site includes including Horinmara Nalkup Guna Mosque/ Madrassa(20m), Community Clinic(10m), Mohasen Ali GPS (20m), Moshrof Ali Guna Jame Mosque(500m), Households(20m) to the North. South Horinmara Mosque(50m), West Horinmara Mosque(500m) to the south. Tuturer Beel (1km) to the east and West Tuturer Beel Mosque/Hefzokhana/ Graveyard (50m), West Horinmara Mosque(1km), Ghatirpara Mosque/Graveyard(1km) to the west. Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists.

Mostly human settlements are found around the sub-project area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). Elephant migration routes were about 5-6 km away from this sub-project. No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below

Section A: Sub-Project Overview

Description of sub-project/component interventions:

This intervention will include the following items;

- **02 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 924, Ch. 1078 and 03 nos.
- **Cross Drain** (dimension: 0.750mX 0.750m) at Ch. 110m, Ch. 313m, Ch.431m, and 04 nos.
- **RCC Box Culverts** (dimension: 2.0mX2.0m) at Ch. 243m, Ch. 530m, Ch.710m, Ch.1278m,
- **RCC U-Drain** (.450mX.450m), (.600mX.600m), (.750mX.750m)
- **429.0m L-Drain** at different chainage,
- **91.0m Toe wall** (1.5 height)
- **960m RCC Palisading (brick) work**
- **135.0m brick Toe wall** (2.0 and 2.5 height)
- **RCC Retaining wall** (24m length X 3.0m height).
- **Road safety** work and **Environmental Mitigation and Enhancement** works are also included (description of such items can be found in BOQ)

Sub-project Location:

Important Features	
ID	422945078
District	Cox's Bazar
Upazila	Ukhiya
Union	Rajapalong
WARD	01 and 03
Proposed Chainage	1405m
Road Type	Village Road-A
Proposed Intervention Type	BC
Distance from Upazila HQ	2km

Road Starting Point Coordinates and name	Latitude: 21.25301^0 N Longitude: 92.11275^0 E Road starts from Horinmara road
Road Ending Point Coordinates and name	Latitude: 21.25691^0 N Longitude: 92.105545^0 E Ends in tuturubeel sarak kobbartek

Land ownership
Government Land

Expected construction period: 1 Year

Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water bodies, etc. and historical or socio-cultural assets): Please also explain any analysis on alternative location was conducted:

Horinmara Nalkup Guna Mosque/ Madrassa(20m), Community Clinic(10m), Mohasen Ali GPS (20m), Moshrof Ali Guna Jame Mosque(500m), Households(20m) to the North. South Horinmara Mosque(50m), West Horinmara Mosque(500m) to the south. Tuturer Beel (1km) to the east and West Tuturer Beel Mosque/Hefzokhana/ Graveyard (50m), West Horinmara Mosque(1km), Ghatirpara Mosque/Graveyard(1km) to the west. Within the influence area of the subproject no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (checked with local IUCN representative).

Section B: Environmental Screening

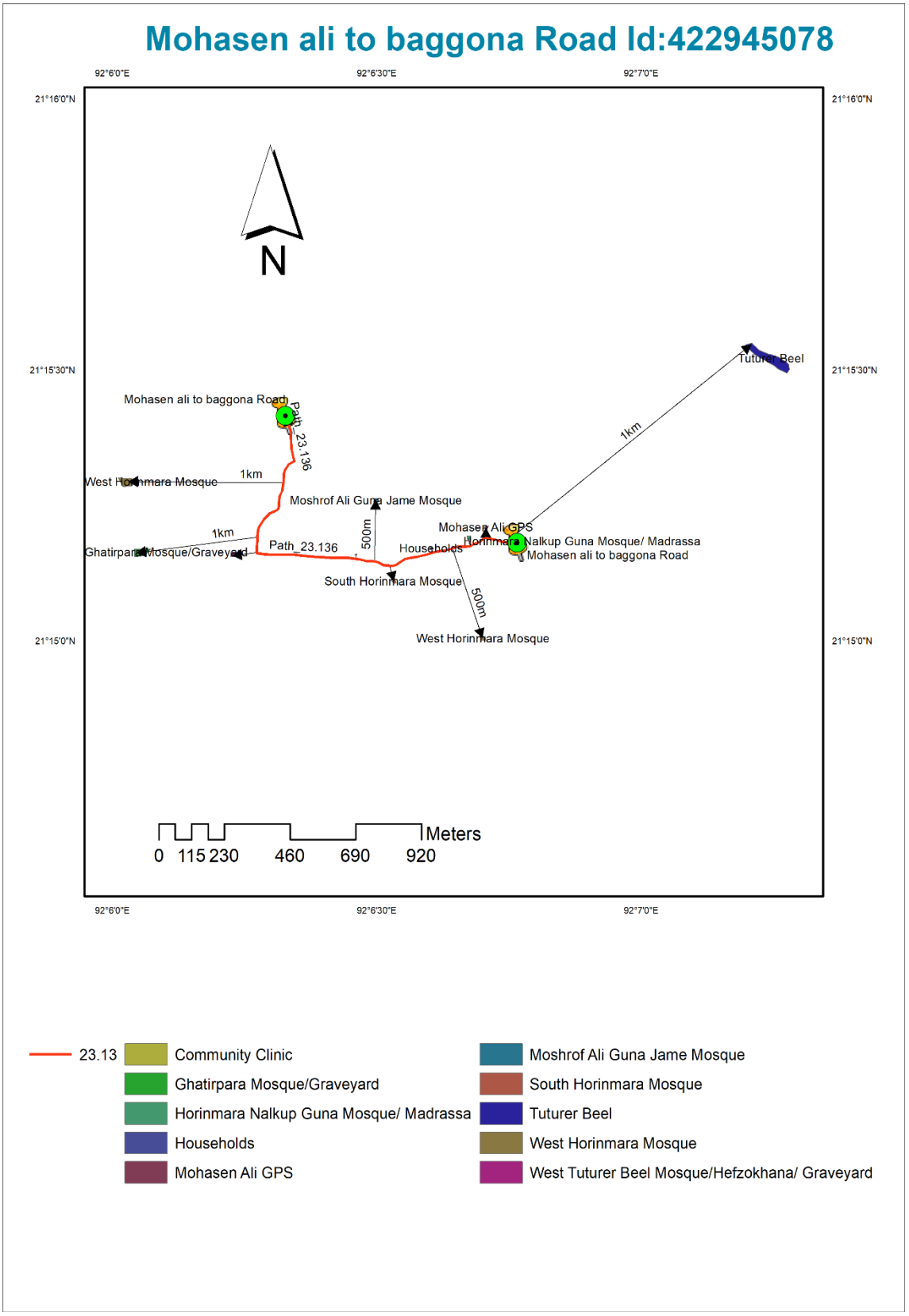
***B.1*: Environmental feature of sub-project location**

Description of cultural properties (if applicable, including distance from site):
Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests:

Horinmara Nalkup Guna Mosque/ Madrassa(20m), Community Clinic(10m), Mohasen Ali GPS (20m), Moshrof Ali Guna Jame Mosque(500m), Households(20m) to the North. South Horinmara Mosque(50m), West Horinmara Mosque(500m) to the south. Tuturer Beel (1km) to the east and West Tuturer Beel Mosque/Hefzokhana/ Graveyard (50m), West Horinmara Mosque(1km), Ghatirpara Mosque/Graveyard(1km) to the west..

There are no other sensitive environmental, cultural, archaeological sites within the catchment area of this sub-project.

A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas are shown below.


Mohasen ali to baggona Road Id:422945078
92°6'0"E
92°6'30"E
92°7'0"E
21°16'0"N
21°15'30"N
21°15'0"N
N
Mohasen ali to baggona Road
Path_23.136
1km
West Horinmara Mosque
Moshrof Ali Guna Jame Mosque
1km
Ghatirpara Mosque/Graveyard
Path_23.136
500m
Households
Mohasen Ali GPS
Horinmara Nalkup Guna Mosque/ Madrassa
Mohasen ali to baggona Road
South Horinmara Mosque
500m
West Horinmara Mosque
1km
Tuturer Beel
Meters
0 115 230 460 690 920
23.13
Community Clinic
Ghatirpara Mosque/Graveyard
Horinmara Nalkup Guna Mosque/ Madrassa
Households
Mohasen Ali GPS
Moshrof Ali Guna Jame Mosque
South Horinmara Mosque
Tuturer Beel
West Horinmara Mosque
West Tuturer Beel Mosque/Hefzokhana/ Graveyard

Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive features found in the footprint area, except matured vegetation on the sides of the road which are homestead gardens and forest. Several mosques, madrasa and local settlement were found during the survey. It will not be affected by the construction works, as the activities will be carried out within the existing subproject boundary and necessary preventive and mitigation measures will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*
No. There is no existence of Elephant corridor/ route now, which have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) potential impacts on remaining forests in/around camps Yes/No
N/A (This activity will be confined within the existing subproject boundary)

(3) Other issues: N/A

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:
Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of vehicle-related pollutants 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/ preventable by mitigation measures.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, tractor, trailer, etc. move on roads adjacent to sub-project throughout the day and night generate noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation):

Landslide potential is low. There is low possibility of soil erosion or landslide during construction

period of targeted sub-project. The impacts are negative but very small scale, site-specific within a relatively small area and adjustable by mitigation measures.
Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH): Groundwater is the main source of potable water in the Sub-project area. The shallow depth is about 80 feet to 150 feet and deep tube well depth is 700 to 750 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 600-800ft (Field survey, 2019). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer. Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)
Status of wildlife movement: **N/A** (None of the information was found about the wildlife movement in or across the area)
State of forestation: Patches of vegetation containing large and matured trees are present in local and homestead gardens across the road side of the proposed subproject area which are located within 200m radial distance.
Summary of water balance analysis (For water supply scheme only): **N/A**

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g. status of access road or any other facility required for sub-project to be viable): An access point called Horinmara road is available. It is possible to carry construction materials on these roads to the construction site with limited traffic flow to avoid congestion.
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction: Toilet and water supply facilities will be ensured by the contractor in the vicinity of the construction area for all the components of the sub-project, electric connection will be established with the accommodation facility due for the workforce. Electricity is available in the area.
Possible location of labor camps: Labor camp can be established along the road since there are available open private lands. However, this will have to be done with the consent of land owner under a mutual agreement, with the supervision of the Engineer in charge.

Requirement and type of raw materials (e.g. sand, stone, wood, etc.): i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction.
Identification of access road for transportation (Yes/No): Yes. Horinmara road is available as connecting road
Location identification for raw material storage: Adjacent to labor camp or different location is available. However, this will need placement on open fields and should be consulted with local committee. Material storage area must be well fenced and materials will be covered with tarpaulins.
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.): Earth/ mud, plastics, brick chips, dust from bricks during construction of project components will be produce. Also, sludge will be produced from labor camp latrines and kitchen waste mostly composing of organic matters as fiber, starch, carbohydrates and proteins. 10% of the kitchen waste may be classified as plastics or non-biodegradables. Solid waste may amount to 20 kg daily and sludge may amount to 5 kg per day.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g. Solids wastes, liquid wastes, etc.): **Solid waste:** Residual waste from the labor camps will be generated. Equipment maintenance/vehicles on-site and scrap material will occur during construction works which are mostly solid waste. Leftover oils or spills from machinery can be a high probability generating liquid waste. Waste from civil works. And the quantity will be tentatively 150 kg. **Liquid waste**: During construction period fecal sludge will be generated from the labor camp and the quantity would be nearly 6 kg per day, which would be reduced in weight in course of time. Leftover oils or spills from machinery can be a high probability generating liquid waste.
Type and quantity of raw materials used (wood, bricks, cement, water, etc.): **Type:** i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction. **Quantity**: It is difficult to give exact figures of construction waste produced on a typical construction site.

Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards: No vegetation is present in the right of way. Specific soil amount is not needed for the project. The current condition explains that there is no aggregated soil on the right of way.
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) The possibility is Medium, for stagnant water bodies to occur. Because water usage will be higher during the construction period. By default, this area has no water logging troubles due to being natural channels. Moreover, no possibilities of stagnation of water in long run. So, local communities have stated that they do not have severe troubles with mosquitos or other disease vectors.
Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No pre-existing waterbody or drainage is present
Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. Because under this intervention, there is very little scope of damage to terrestrial or aquatic ecosystems or endangered species.
Activities that can lead to landslides, slumps, slips and other mass movements in road cuts: Scope of work leading to low scale effects of landslide. The impacts are negative but short-term and site-specific. It can be managed through mitigation measures.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description) Low, since both sides of the road is more or less similar elevation. The concentrated outflow will be managed since the sub-project has included drains.
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials. The existing HBB and BFS part of the road is adequate for traffic movement however, contractors will have to maintain traffic plan so that local transports do not find it difficult to pass during construction work.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: No
Chance of long-term or semi-permanent destruction of soils: (High/Medium/Low with description)

No

Possibility of odor and water, soil quality impacts from SWM and FSM disposal system: (High/Medium/Low with description)

No

Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation)

There is no possibility of stagnant water bodies remained for encouraging mosquito breeding and other disease vectors, during the operation phase.

Likely direct and indirect impacts on economic development in the project areas by the sub-project:

Construction or implementation of a road project substantially contributes to the development of the project areas. It surely improves the communication network, reduces the transport time, increases the trade and business in/around the areas, and ensures access to better living conditions with amenities, better educational and job opportunities and health facilities. Thus, the direct and indirect impacts on economic development in the project areas would be enormous by this sub-project.

Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description)

No existing drainage channels or surface water bodies found in the project area; therefore, no such effect can be anticipated

Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description)

Low. There are no protected areas in or around project sites, and no known areas of ecological interest.

Activities leading to landslides, slumps, slips and other mass movements in road cuts:

The entire sub-project component area is nearly flat; thus, no such type of impacts is anticipated.

Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation)

No

Describe possible traffic movement impacts on (unwanted) light, noise and air pollution:
Improved communication will definitely increase the traffic/ vehicular movement, which must increase the light and noise pollution, but air pollution effect will not be increased significantly, as the proposed BC road will reduce the pollution generated from dust on the muddy road, especially during the dry season and if the vehicles are maintained in good conditions

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

Section D: Environmental Screening Summary of the Work Package-W23.13

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
1: Sub-Project Interventions	**Air quality**	Under the subproject intervention the overall score is **low**.	• Limiting earthworks; • Watering of dry exposed surfaces and stockpiles of aggregates at least twice daily, as necessary; • Requiring trucks delivering aggregates or bricks and cement to have tarpaulin cover and Limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Covering of trucks; • Records of air quality inspection;	Visual monitoring of air quality and if requires, air quality test (CO, $PM_{2.5,10}$) once in construction period in winter season.
	Soil impacts	Under the sub-project intervention the overall score is **low.**	• Precautions might be taken when rainstorms are likely, when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms. • The earthwork sites where exposed land surface is vulnerable to runoff shall be consolidated and/or covered. • The material stockpile sites shall be far away from surface water bodies and areas prone to surface run-off. Loose materials shall be bagged and covered. • Channels, earth bunds, netting, tarpaulin and or sand bag barriers	Construction Contractor monitored by Consultant and PIU	• No visible degradation to nearby drainages, • *khals* or water bodies due to soil erosion. • Rain storms in construction phase.	Monitoring as weekly basis.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
			shall be used on site to manage surface water runoff and minimize erosion. • The overall slope of the work areas and construction yards shall be kept to a minimum to reduce the erosive potential of surface water flows elsewhere.			
	Hydrology (surface and groundwater)	Under the subproject intervention the overall score is **low**.	• All precautions to store chemicals/oil/fuel properly so that no chance of spill. • Workers must specify waste dump locations to avoid littering which in turn might negatively affect surface and ground water. • Monitor water quality according to the environmental management plan.	Construction Contractor and monitored by Consultant and PIU	• Areas for stockpiles, storage of fuels and lubricants and waste materials; • Records of water quality inspection; Water Quality Test • (National Drinking Water Quality Standard Parameters)if requires; • No visible degradation to nearby drainages, *khals* or water bodies due to construction	Water quality test (mainly GW) twice during the construction period in six months interval.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
					activities. • Records should be kept and logged.	
2: Pre-construction Phase	**Sanitation, water supply**	Under the subproject intervention the overall score is **low**.	• Provide suitable housing, adequate supplies of potable water, and toilet and bathing facilities within labor camp area for the assigned laborer. • Provide means for disposing of wastewater from toilets, baths and food preparation areas either through a septic tank and soak away, or holding tank with removal by vacuum truck. • Records for any type of training or awareness building sessions must be kept at site.	Construction Contractor and monitored by Consultant and PIU	• Site-specific H&S Plan; • Records of supply of uncontaminated water; • Record of Health &Safety orientation trainings; • Condition of sanitation facilities for workers	Visual inspection by PIU and supervision consultants on monthly basis
	Transportation	Under the subproject intervention the overall score is **low.**	• Contractor should verify vehicles for the suitability of carrying, loading and unloading of materials	Construction Contractor and monitored by Consultant and PIU	• Record of regular inspection. • Record of accidents/incidents	Monthly monitoring.
	Storage of construction	Under the subproject	• Orienting concerned person and team assigned for the construction	Construction Contractor and	• List of materials and sources of	During implementation

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
	materials	intervention the overall score is **low**.	work.	monitored by Consultant and PIU	materials;	phase, as necessary with discussion with PIU, Consultant
3: Construction Phase	**Wastes**	Under the sub-project intervention the overall score is **low.**	• Prepare and implement on-site waste water runoff and labor camp waste management plan approved by PIU and consultants. • Wastes must be placed in the designated bins which must be regularly emptied. These shall remain within demarcated areas and shall be designed to prevent wastes from being blown out by wind. • All waste must be removed from the site and transported to a disposal site.	Construction Contractor and monitored by Consultant and PIU	• Complaints from community; • Regular inspection of waste management activity; • Waste disposal record.	As work weekly progresses
	Cut and fill Activities (Cutting of hill slope and earth removal from borrow areas caused for soil erosion and landslides)	Under the sub-project intervention, the overall score is low.	• During construction cut and fill will be balanced as far as is possible. Designs shall ensure that as far as possible all cut and fill activities are balanced • Proper care will be taken during cutting and filling so that slope or toe of the road embankment remain within the right of way and does not disturb the crop.	Contractor, environmental specialist of D&SC	• Location of road alignment and slope.	Daily as work progresses

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
	Storage of materials	Protected and safety storage to be needed for construction materials storage. Not interrupt natural land contours, disturbance in natural drainage patterns and logging of water and the overall score is **low.**	• With the assistance from site management committee in Camp to identify the storage site and other requirements, which will be approved by PIU and consultants.	Construction Contractor and monitored by Consultant and PIU	• List of materials and sources of materials; • Storage areas for materials and equipment.	Monthly basis during implementation phase, as necessary with discussion with PIU, Consultant
	Removal of Vegetation (May cause soil erosion and their deposition on nearby crop field, affecting soil quality and productivity)	Under the sub-project intervention, the overall score is **low.**	• If during detailed design cutting of trees is required, compensatory plantation for trees lost at a rate of 5 trees for every tree cut. • Prevent workers or any other person from removing and damaging any flora (plant/vegetation) and fauna.	Contractor, environmental specialist of D&SC	• Complaints from community;	Daily

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
	Noise pollution	Under the subproject intervention the overall score is **low.**	• Consultation with affected people; not to operate noisy equipment during working period; • No noisy work after 5.00 pm. • Sound suppression for equipment; • Ear protection for workers. • Conduct noise quality monitoring as per EMP.	Construction Contractor and monitored by Consultant and PIU	• Number of complaints from stakeholders; • Use of silencers in noise-producing equipment and sound barriers; • Noise Level following decibel meter (dB)	Inspection by PIU and supervision consultants on monthly basis;
	Air pollution	Under the subproject intervention the overall score is **low.**	• Water spraying for dust control; construction materials with potential for significant dust generation shall be covered; no smoke emitting equipment; and limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor and monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Records of air quality inspection.	Visual observation and monitoring of air quality during construction period.
	Road Safety and Accidents	Under the subproject intervention the overall score is **low.**	• Erection of suitable signage at construction sites • Direct observation and discussion with local people • Restrict the transport of oversize loads. • Operate construction vehicles to non-peak periods (night) to minimize the traffic disruption. • Enforce on-site and access road speed limits.	Construction Contractor, environmental specialist of D&Sc.	• Complaints from communities, pedestrians	Day basis during work time

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
			• The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc. • Local residents should be kept informed about planned Works			
4. Post Construction	**Road Safety**	Under the issue the overall score is **low**.	• Install traffic signs for speed limit, speed breaker where needed, Mile post and create adequate ***traffic*** detours, and sufficient ***signage*** & ***warning*** signs, Post speed limits and suitable bending on the road. • The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc.	Construction Contractor, environmental specialist of D&Sc	• Road signage and safety instruments at suitable locations and chainage	Immediately after the construction work is over.
	Tree re plantation	Under the issue the overall score is **low**.	• Replantation of trees during monsoon period • Maintain of trees properly • Check survival of trees and replant the dead trees	Construction Contractor, environmental specialist of D&Sc	• Number of complaints from stakeholders; • Records of trees number and tree plantation inspection;	Immediately after the construction work is over.
5. Operatio	**Maintenance of road and**	Under the issue	• No advertisement/boardings shall be allowed within the Right of Way	LGED	• Number of complaints from	During Operation under LGED's

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
nal Phase	**assets** (Road accidents may increase due to higher number of vehicles using the roads at increased speeds)	the overall score is **low**.	limits of the project road. • Regular maintenance and cleaning of assets such as sign boards, road safety sign etc. shall be undertaken. • Clear smooth speed breaker/rough surfaces should be clear in views. • Regular maintenance of road surface and shoulders.		stakeholders;	regular maintenance program in each 3 years.

* Overall Impact Score: High = Likely to cause long-term E&S impacts; Medium = Likely to cause temporary impacts; Low = Likely to cause little, short-term impacts

**Post-construction phase denotes the time period contractor use to clear and clean up the sites after the construction work is ended, perform tree plantation, grass turfing, and minor rectification till the official handing over the site to LGED, or owner of the site.

Recommendation for further environmental and social assessment and/or site specific environmental and social management plan: Yes

**If yes, please specify what assessments/plans would be required.* Mention some recommendation on E&S assessment …. ESMP

If site specific environmental and social management plan (ESMP) is followed the impacts can be mitigated and monitored. ESMP is attached.

Appendix-2: Environmental and Social Management Plan (ESMP)

ESMP for Access and evacuation Roads; *(LGED/EMCRP-W23.13): Mohasen Ali to baggona Road Id: 422945078*

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
Pre-Construction Stage	Loss of land / and other physical assets	• No land acquisition is allowed within this sub-project activities So, there are no any mitigation measures according to this impact.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of livelihood	• Under this subproject, there is no scope of negative impact of adjacent livelihoods	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Stakeholders Engagement	• All of the project stakeholders should be consulted • Separate community level consultation meeting with the potential affected HHs • Consultation meeting with host communities about the project objectives and scope of works	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of right to access	• Project to ensure thorough analysis of alternatives that access enjoyed by the community remains intact. • In case of unavoidable circumstances, alternative access will be provided.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Site Selection & implementing interventions: Human-elephant conflict	• Selection of sub-project sites and all implementing interventions must take place outside of the elephant corridor/influence area.	PIU	Environmental Consultant of PIU, PSC
Pre-Construction Stage	Site Preparation: Soil Erosion; Alteration of natural drainage	• Our selected sites avoided the low land near the water bodies or natural flow path to avoid the flash flood or any kind or surface runoff.	PIU & Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Tubewell location within the construction site is not near to any kinds of latrine and soaks well which could be contaminated by those. • After completing the development, we restored the place as like before to avoid the cut and fill operational problems. • This site is in the local community, so we discussed with the local community to avoid any conflicts related local habitation, culture. • Sub project intervention mustavoid of natural disturbance of existing slop and natural drainage. • The contractor ensuring sound environment for the local residents near the sub project site.		
Construction Activity	Noise from construction works	• Construction activities mostly will finish at day time within 05 PM, and must confirm proper measures for avoiding any disturbance. • All Personal Protective Equipments (PPEs) must be ensured in sites before starting any kinds of construction works.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Dust	• Acceptable range of emission of CO, particulate matter [SPM (**Suspended particulate matter)**, PM2.5, 10] and Hydrocarbons must be maintained through good construction work practices • Dust generation must be limited as a result of clearing, leveling and site grading operations with using water florescent manually and through water	Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		pipes. • Dust generation due to vehicle movement on connecting road shall be controlled by watering the path at limited level		
Construction Activity	Safety Issues	• Unauthorized entry is completely prohibited in our site and take necessary measures for preventing this problem • Before works started Contractor must provide proper training and guidelines on health and safety issues to the labors and associated staffs. • Records of every training must be kept at site. • All kinds of Child labour are completely prohibited in every site. • Every construction materials storage site will be well fenced by Tin and safety caution tape.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Traffic Management	• Contractors will maintain proper route for traffic management which is to beconsulted with and confirmed by the Executive Engineer of Cox's Bazar.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Conflicts with existing users due to the scarcity of resource base.	• A detailed assessment of the available resources and consent of the local representative for withdrawal of water from existing surface water sources shall be taken. • If ground water is withdrawn, adequate approvals from the appropriate department need to be undertaken before setting up bore wells. • Any type of consent letter or agreement for	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		withdrawing water from either surface or underground sources will be kept on site. • Local community must be consulted before any construction works starts.		
Construction Activity	Increase in road accidents	• Maintain safety measures during the movement of heavy machinery and equipment. • Local community will be trained up on traffic management and awareness.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Labour Base Camp: Conflicts with the local residents	• Awareness building session will be undertaken about prevention of child abuse, child marriage, GBV, sexual harassment, trafficking of women and children as well as illegal drug trade. Written records of this awareness building session shall be kept on site. • Work force should be prohibited from disturbing the flora, fauna including hunting of animals, wildlife hunting, poaching and tree felling. • Adequate facilities ensuring sanitation for labour camps will be put in place • Treated water will be made available at site for drinking purpose. • Adequate accommodation arrangements for labour forces. • Labor code of conduct is to be disclosed through consultation.	Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Construction Activity	Waste Management: Improper management and handling of	Preparation of a waste management plan covering the following aspects:	Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
	hazardous and non-hazardous waste during construction.	• Residual waste from the temporary accommodation facilities for labor Waste and from equipment maintenance/vehicles on-site • After completion of construction works. So, recycling process is not applicable. • Proper consents for hazardous waste management.		
Construction Activity	Health & Safety Risks: • The potential for exposure to safety events such as tripping, working at height activities, fire from hot works, smoking, failure in electrical installation, mobile plant and vehicles, and electrical shocks. • Exposure to health events during construction activities such as manual handling and musculoskeletal disorders, hand-arm vibration, temporary or permanent hearing loss, heat stress, and dermatitis.	• All construction equipment will be properly inspected timely. • The risk assessment will be prepared and communicated prior to the commencement of work for all types of work activities on site. • Preparation of proper walkways and clearly designation as a walkway has to be ensured; all walkways shall be provided with good conditions underfoot; signposted and with adequate lighting. • Proper Signpost at any slippery areas will be ensured in construction site. • Fire extinguishers will be located at identified fire points around the site. The extinguishers must be appropriate to the nature of the potential fire. • This sub project has Proper communicative emergency response plan (ERP) with all parties, the ERP to consider such things as specific foreseeable emergency situations, organizational roles and authorities' responsibilities and expertise, emergency response and evacuation procedure and personnel will	PIU & Contractor	Environmental Consultant as well as Social Development and Gender Specialists of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		be trained and drilled to test and ensure the coherence with the plan. • All people of construction site will be concerned about the safety and maintenance of Electrical equipment; works will be carried out on live systems. • Provision to first aid box in sub-project areas will be ensured. • Proper Emergency evacuation response plan will exist in sub-project area. • All safety equipment will be available in sub-project site (safety, size, power, efficiency, ergonomics, cost, user acceptability etc.), the lowest vibration tools will be provided that are suitable and can do the works. • Awareness training will be given to all personnel involved during the construction phase in order to highlight the heat related illnesses of working in hot conditions such as heat cramps, heat exhaustion, heat stroke, and dehydration. Written records of this awareness training shall be kept on site. • Adequate quantities of drinking water will be available at all Sites, on different locations within the site. • Provision to maintain proper PPE wherever necessary and to ensure that there are satisfactory washing and changing facilities. • Provision to ensure all workers exposed to a risk are aware of the possible dangers and also given thorough		

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		training on how to protect themselves and there should be effective supervision to ensure that the correct methods are being used.		
Operation &Maintenance	Noise disturbances to fauna	• Provision to maintain noise and vibration from the operation and maintenance of machinery and equipment by proper monitoring and measures. • Provision to take necessary lighting, caution for the works and necessary maintenance should be done in day light.	PIU	Environmental Consultant of PIU, PSC. Union Member
Construction activity	Odours and pollution caused by leaking latrines and faecal sludge, and solid wastes impacting surrounding water bodies, flora and fauna	• Preventative maintenance schedule should be followed. • Solid organic wastes should be stored in bins and/ or skips and emptied regularly at a designated waste disposal area away from the camp site. If no designated site is available within the reach, a dug-hole at a nearby place can be used with periodic filling with soil layer for preventing pollution and generating nutrient rich compost soil over time.	PIU	Environmental Consultant of PIU, PSC. Union Member
Decommissioning during the project implementation period (including site clearance after the construction)	The impacts are similar to those listed in construction stage: • Pollution from waste materials • Health & Safety risks to workers and local community	• Contractor must prepare a demolition and waste management plan including following directive aspects given hereunder.	PIU / Contractor	Environmental Consultant of PIU, and Executive Engineer of Cox's Bazar

Waste Management Plan:

The Contractor shall develop a waste management plan for various specific waste streams (e.g., reusable waste, flammable waste, construction debris, food and organic waste etc.) prior to commencing of construction and submit to LGED for approval. The plans must include following principles or series of actions, which will be carried out/followed by the contractor and supervised by the Field level Environmental Specialist and Social Development Specialist.

For wastes:

- The quantity of waste materials shall be minimized by 3R (Reduce, Recycle and Reuse) approach, and wastes shall be segregated accordingly, wherever practical; and stored in designated places/facilities in the site.
- Construction site shall be maintained in a cleaner, tidy and safe condition and appropriate facilities shall be provided and maintained as temporary storage of all wastes before transportation and final disposal.
- Hazardous waste viz. waste oil etc. will be collected and stored in a paved and bounded area and subsequently sold to authorized recyclers.
- The scrap material generated from related construction activities will be collected and stored separately in the stack yard and sold to local recyclers.
- All wastes generated during construction shall be disposed off in an environmentally acceptable manner. This will include consideration of the nature and location of disposal site, so as to cause less environmental impact.
- Other leftover non-hazardous wastes, including construction debris shall be transported to an approved disposal site by pick up tracks or back loaded vehicles with proper care.
- Organic wastes produced in the camp site during the construction period shall be collected and transported in vehicles covered with tarps or nets to prevent spilling waste along the route to the designated disposal site;
- Burning of any type of wastes in the construction site shall be prohibited completely.

Prepared by: Harogopal Kabiraj, Environmental Focal Person, +8801714980171

Tanvir Ahsan Haque, Environmental Specialist, +8801688117059

Ms. Sadia Azad, Disaster and Climate Change Specialist, PIU.

Reviewed by: Md. Saiful Islam, Field Level Environmental Specialist, +8801913442006

Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.13

In consideration to the above-mentioned environmental impacts and their mitigation measures for all sub-projects, individual BOQ for each component has been prepared. Following tables will illustrate such items of enhancement and impact mitigation works as well as considering the emerged situation of COVID-19, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites.

Cost of Environmental Enhancement Works for W23-13 in BOQ

Sl no.	Description of item	Quantity	Unit price	Total amount
1.	**Grass Turfing** Turfing on embankment top and slope, building compound & any critical place with good quality turf supplied by the contractor of not less than 225mm square in dimension including placing and watering till grass is fully grown, etc. all complete as per direction of E.I.C. (Payment to be made only when grass is fully grown)	4120.20 sqm	@38.15 Tk. Per sqm	157185.63
2.	**Aid Box** Supply of first aid box with standard contents and as per direction of the E.I.C.	01	@5000 Tk. Per box	5000
3.	**Dust suppression measures** Dust suppression measures like water sprinkling on aggregates/ unpaved roads, in and around the work site and as per direction of the E.I.C.	1405 meters	2.56 Tk. per meter	3596.80
4.	**Motivation training** Motivation training (twice: before and after construction start) of the Upazila Engineer' sand Contractor's representatives on safety practice and as per direction of the E.I.C.	LS	Lum Sum @ 10000	10000
5.	**Providing Safety gear/ (PPE)** Providing Safety gear package like hand gloves, eye protection glasses, helmets, rubber shoes, light reflecting dress etc.	LS	@ Tk. 30000	30,000
6.	**Tree plantation** Tree plantation around the shelter or road including maintenance for 2 years as per direction of E.I.C. (Coconut, Mango, Jackfruit etc. to be planted. The payment is to be made only when trees	160 nos.	@ Tk. 1000 for each tree.	160,000

	are fully grown) and as per direction of E.I.C. Total 10 nos. of trees need to be replanted around the periphery of the proposed site at an interval of 10 feet.			
7.	**Temporary Sanitary Latrine** Temporary Sanitary Latrine/ Septic Tank/ Portable Toilet: 2 nos. (1 no of Toilet for female and 1 no of Toilet for male) and as per direction of E.I.C.	2 nos.	@12822.86 per toilet	25645.72
8.	**Waste disposal** Temporary camp site waste disposal facility improvement 2 nos. (1 no of organic waste and 1 no of inorganic waste disposal facility) and as per direction of E.I.C.	LS	@5000	5000
9.	**Drinking water Facility** Supplying continuous adequate drinking water supply at work site and site office as well by installing necessary tube-well/s where applicable with best quality water tank (Gazi/Padma) and water filter of minimum capacity of 30 liters with necessary kits. All complete as per satisfaction of EIC.	2	@30000 tk for each setup	60000
10.	**Test (Drinking Water samples)** **Water samples** to be collected periodically (half yearly) for Tube well at labor shed for laboratory analysis of different parameters such as pH, arsenic, iron, chloride, hardness, total dissolved solids, nitrate, nitrite, coliform, electrical conductivity etc. all complete as per direction of E.I.C. (including the cost of actual fees for testing from reputed laboratory and report) as desired by E.I.C.	LS	@5000tk	5000
11.	**Traffic Management** Maintaining traffic management at worksite from time of commencement of contractor's activities to time of completion activities, including ensuring that the road is safe for user s and providing a safe working area for those involved in work.	LS	@ Tk.15000	15000
12.	**Worker labor shed** Size (30'X20') with C.I sheet roofing, Tarza fencing and brick soling floor as per requirement and direction of EIC	1	@Tk. 30000	30000
13.	**Environmental management** Environmental management costs of the Environment & Social/ Safeguard Personnel for Environmental and Social Management and Monitoring during construction and operation phase	1 person	Monthly basis @Tk. 35,000.00 for 12 months. One person covering 5 roads	84,000.00

	for their salary & transport (Net payment excluding Tax &VAT). And as per direction of the E.I.C. **(One Safeguard Personnel for R1, R2, R4, R10, & R13)**		i.e.35,000Tk.*12months*(1/5 one road).	
	Subtotal Bill: Environmental facilities			**590,428.15**

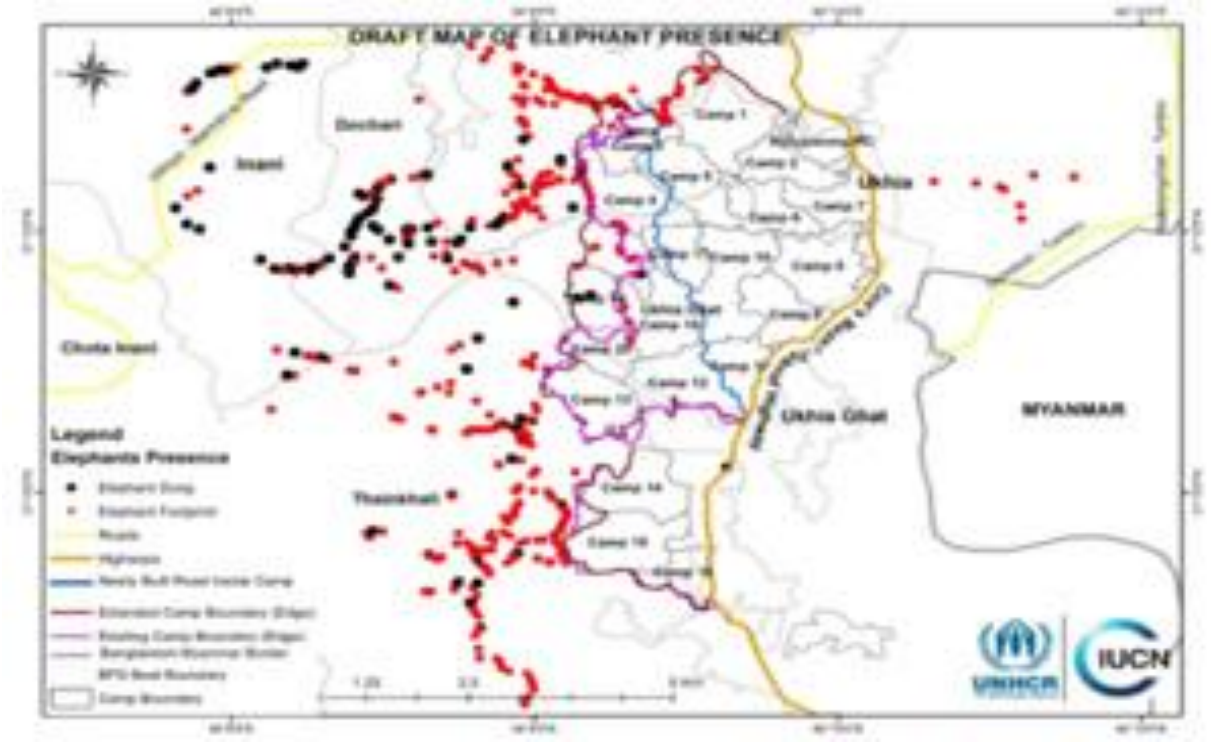
Cost of H&S Measures under COVID 19 Situations for W23-13

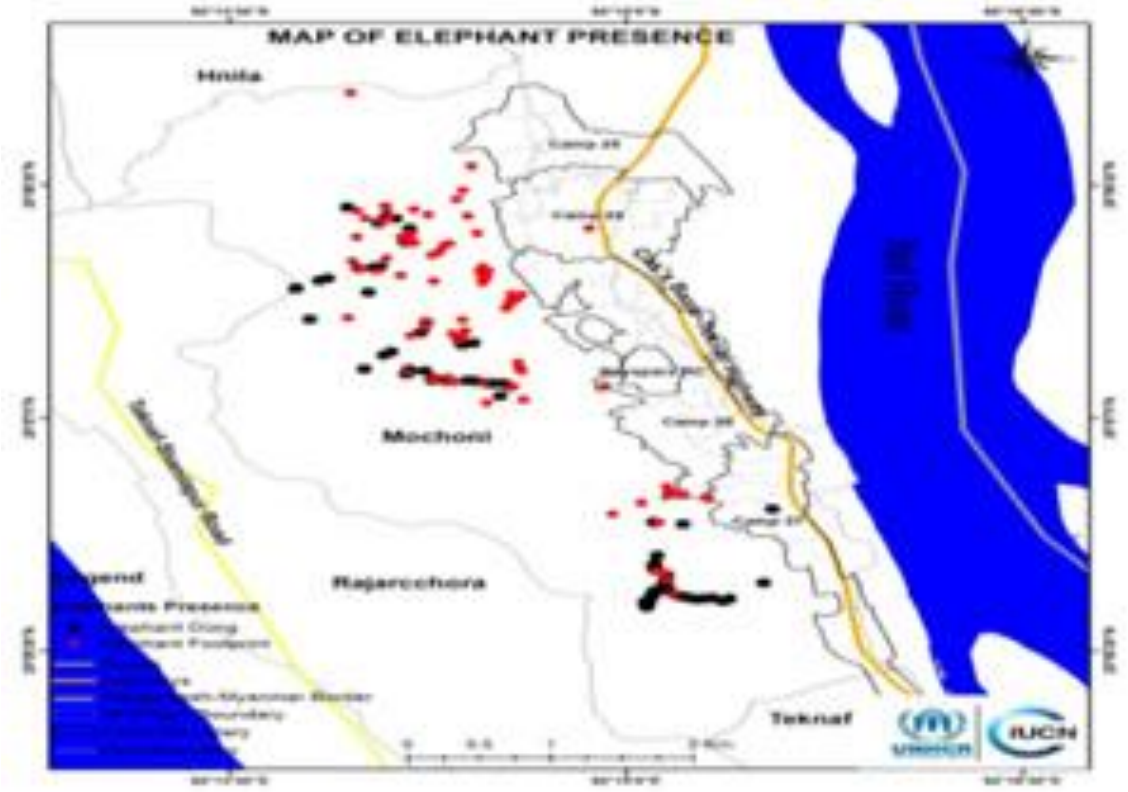
Considering the emerged situation, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites. The cost is estimated counting 30 workers for 270 active working days (9 months in a year) in a contract period for one site under this package (EMCRP/W-23.13).

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
1.	Non-Contact IR Digital Thermometer	01 nos. in each site	N/A	N/A	5,000.00	1	5,000.00	Each site office will have a thermometer for checking body temperature every morning at the entrance of the working site
2.	Wash Basin with Small Water Tank, Bucket and Mug (or piped water supply)	01 nos. in each site	N/A	01 nos. in each camp	10,000.00	2	20,000.00	Wash basin to be installed at favorable locations immediately after the entrance to the facility
3.	Trash bin (covered)/Paddle Bin	01 nos. in each site	N/A	01 nos. in each camp	550.00	2	1,100.00	
4.	Bar Soaps (150 gm each)	81		101	50.00	182	9,100.00	To be placed in a case/holder on the basin, for washing hands for max. 35 people a day and showering of 30

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
								workers in each labor camp.
5.	Hand Sanitizer (2 nos. 250 ml bottle and 5 liter Can for Refill)	2 bottles and 1 Can for each site	N/A	N/A	4,000.00	1	4,000.00	2 bottles and a 5 litre can for each Site office
6.	Face Shield/ Protective Safety Goggles	16 nos. for each site		N/A	400.00	16	6,400.00	For labors who work in close contact, 16 in each site
7.	One time Mask (Disposable) for Contractors' Staffs	5 nos. each day in each site		N/A	12.00	1350	16,200.00	Reusing N95/KN95 mask will not be a manageable option in field scenario, one time disposable medical/surgery mask a good option instead.
8.	Cloth mask for Workers	N/A	30 nos. for each labor camp		35.00	540	18,900.00	A worker will use a mask for 15 days with everyday washing
9.	Floor Cleaner (1 litre Can)	1.5 Can	N/A	3 Can	250.00	4.5	1,125.00	
10.	Detergent Cleaner	N/A	1.5 kg in each camp/month		400.00	13.5	5,400.00	To be used for washing clothes, masks and tools & equipment, etc.
11.	Miscellaneous cost				20,000.00	1	20,000.00	Contingency cost for medical emergency and compensation for workers, subject to proper documentation
	Grand Total						**107,225.00**	

Appendix-4: Elephant Migration Routes Map





Elephant presence map (latest information published on 24 May 2018)

Appendix-5: Location Map of Sub-project component

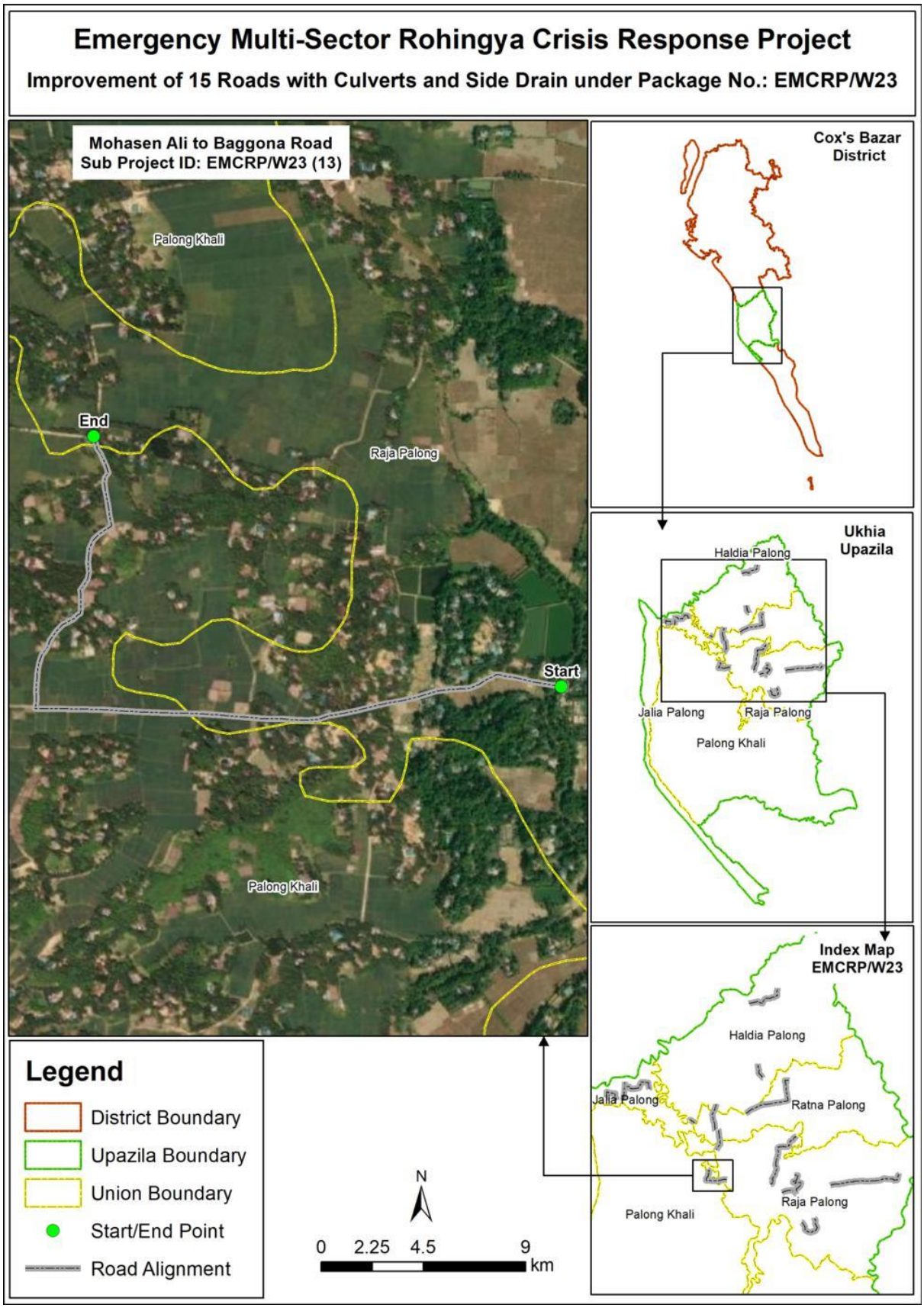
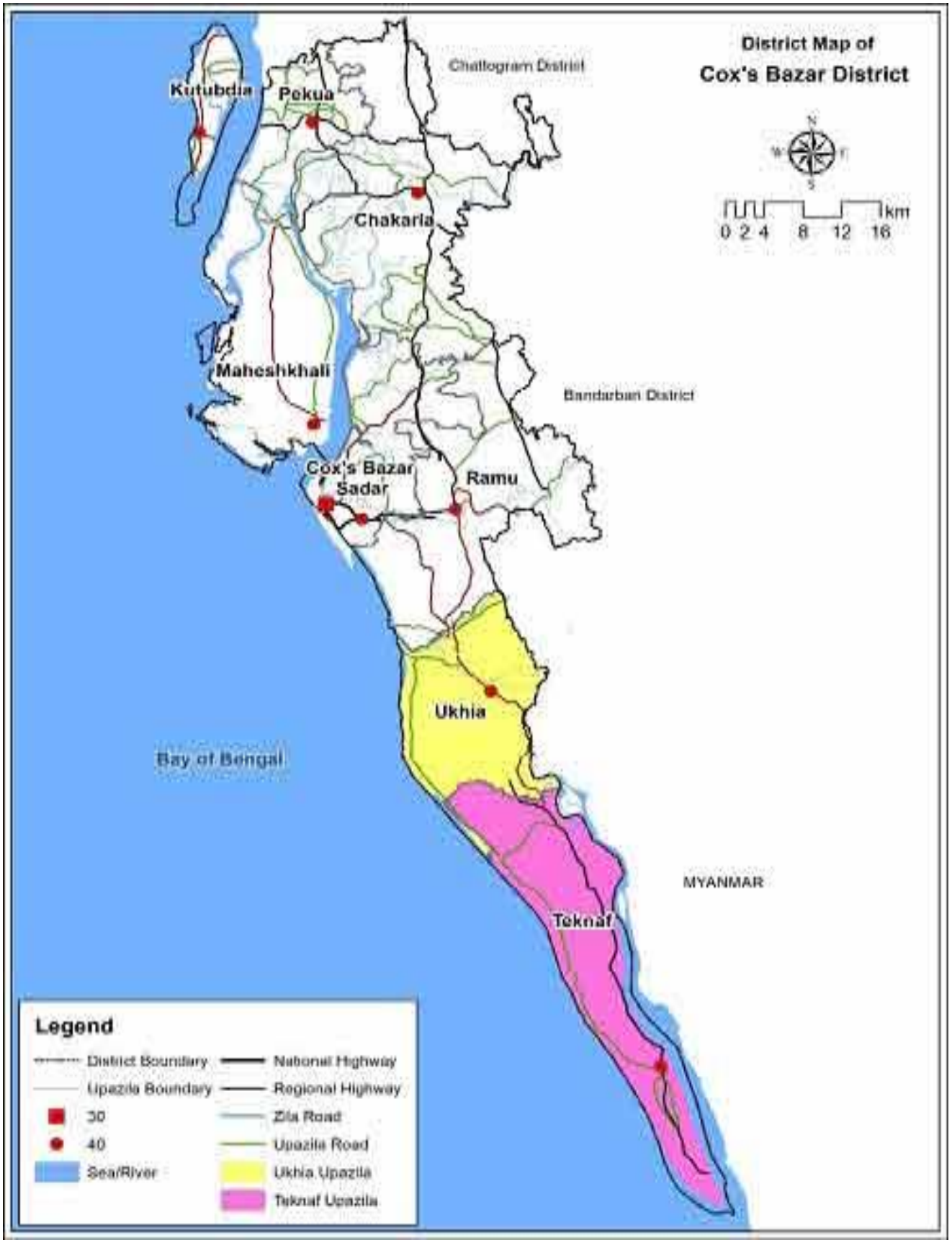
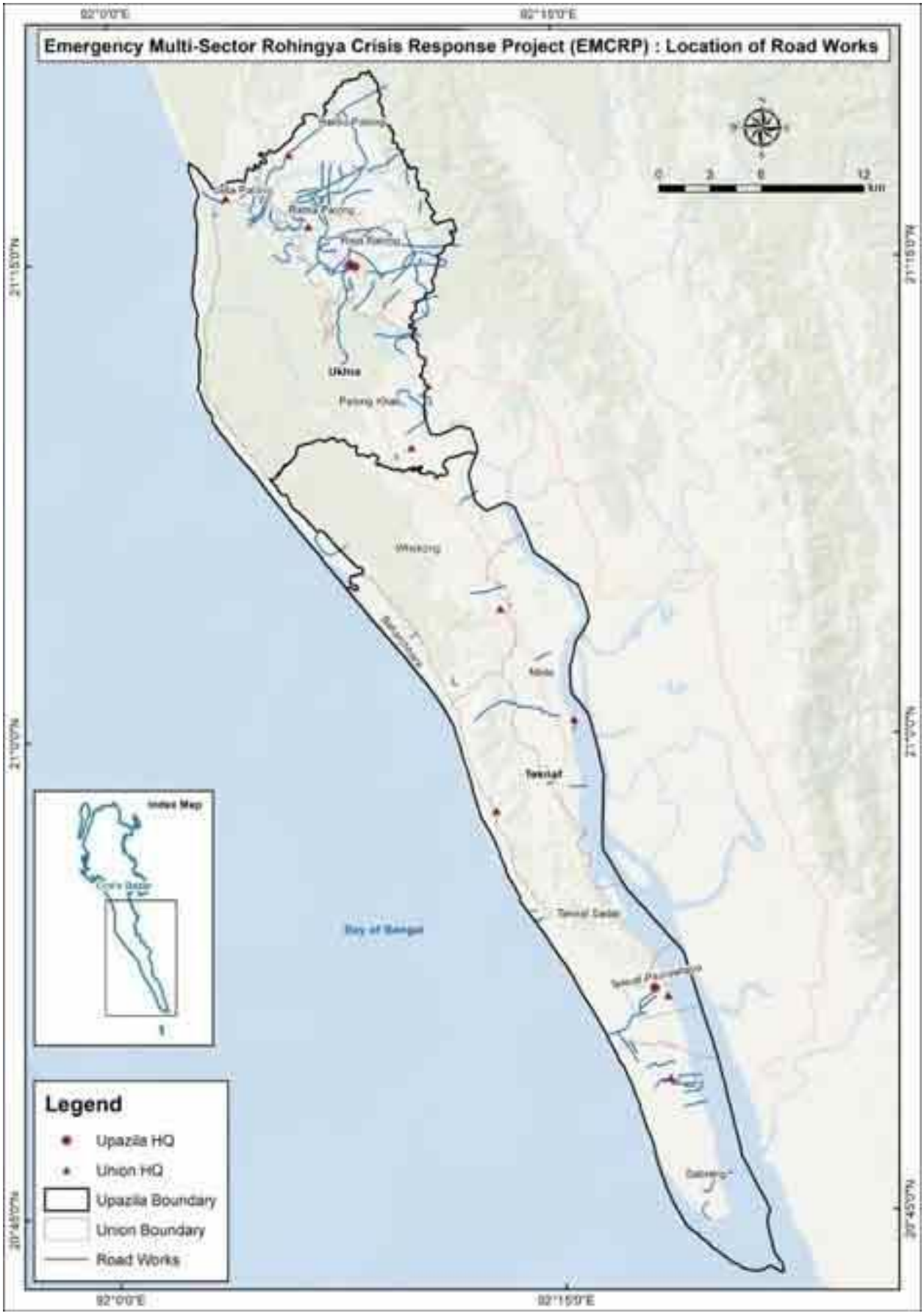


Figure: Location Map of W23-13



District map showing Ukhiya and Teknaf Upazila



Upazila map locating proposed roads

GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH
Ministry of Local Government, Rural Development and Co-operatives
Local Government Division
Local Government Engineering Department

Emergency Multi Sector Rohingya Crisis Response Project (EMCRP)

Project ID: P167762 **IDA Credit No. 5561-BD**





Environmental Screening Report

For Bangamata Mohila college to east sikder bill Road Id: 422945079 with culverts and side drain under Cox's Bazar District.

Under the package no. EMCRP/W23

Funded by:

THE WORLD BANK
IBRD • IDA

Government of the People's Republic of Bangladesh & World Bank

Design and Supervision Consultancy:

Development Design Consultants Ltd.

October-2020

Contents

1. INTRODUCTION 1

1.1 Project background 1

1.2 Elementary information of Work Package Component of W23.14 2

1.3 Proposed intervention items for this component 4

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS 4

2.1 Methodology 4

2.2 Important features/establishments within the PIA 5

2.3 Issues and Recommendations raised by the Participants 6

3. ENVIRONMENTAL SCREENING 7

3.1 General 7

3.2 Major Findings 8

3.3 Climate Change Impact Screening 10

3.3.1 General Overview of the area 10

3.3.2 Site Specific Screening and outcome 11

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) 12

4.1 General 12

4.2 Health and Safety Measure under COVID Situation 14

4.3 Cost of Environmental Enhancement Works in BOQ 15

5. LIMITATION OF THIS STUDY 15

6. CONCLUSION AND RECOMMENDATIONS 15

Annexure-01: Important Environmental Features (IEFs) near site 17

Annexure-02: Attendance of consultation meetings for W23/14 18

Annexure-03: Pictures of sub-project component location and surrounding features with public consultation 20

Appendix-1: Environmental Screening Form for examining sub-project component 21

Appendix-2: Environmental and Social Management Plan (ESMP) 39

Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.14 47

Appendix-4: Elephant Migration Routes Map 52

Appendix-5: Location Map of Sub-project component 53

ACRONYMS

BOQ	Bill of Quantities
BFS	Brick Flat Soiling
D&SC	Design and Supervision Consultant
DoE	Department of Environment
DRP	Displaced Rohingya people
EA	Environmental Assessment
EC	Electrical Conductivity
EMCRP	Emergency Multi-Sector Rohingya Crisis Response Project
ESMP	Environmental and Social Management Plan
ERP	Emergency Response Plan
ESMF	Environmental and Social Management Framework
FDMN	Forcibly Displaced Myanmar National
FGD	Focus Group Discussion
FSM	Faecal Sludge Management
GBV	Gender Based violence
GPS	Government Primary School
GRM	Grievance Redress Mechanism
HBB	Herring Bone Bond
IEFs	Important Environmental Features
ISCG	Inter Sector Coordination Group
IUCN	International Union for Conservation of Nature
IWM	Institute of Water Modeling
LGED	Local Government Engineering Department
PIA	Project Influence Area
PIU	Project Implementation Unit
PMU	Project Management Unit
PPE	Personal Protective Equipment
PSC	Project Steering Committee
SMC	School Management Committee
SPM	Suspended Particulate Matter
SWM	Solid Waste Management
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
UNHCR	The United Nations High Commissioner for Refugees
VAT	Value-Added Tax
WB	World Band

1. INTRODUCTION

1.1 Project background

An estimated 730,000[1] people of Rohingya community has fled to neighboring Cox's Bazar district of Bangladesh since August 25, 2017 to escape extreme violence in Rakhine State of Myanmar, which caused the total number of Forcibly Displaced Myanmar National (FDMN) in the district to be about 923,033[2]. This huge number of displaced population account for about one-third of the total population of Cox's bazar, a district which was already facing many development challenges and suffering from resource-constrained social service delivery system even before the crisis evolved and the mass exodus of FDMN has worsened the situation further. Almost all of these displaced people are hosted in Ukhiya and Teknaf Upazila of Cox's Bazar, in extremely congested settlements in areas having very minimal access to basic infrastructure and services and is prone to natural disasters. The Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP) has been designed in order to reduce the vulnerability of Forcibly Displaced Myanmar National (FDMN) along with people from the host communities in Teknaf and Ukhiya Upazila under Cox's Bazar District, to different disasters and improve the social service delivery system and disaster resilience to both the communities. This project will follow a sustainable development pathway that is resilient to disaster and climate change effects.

The objective of the Project is to provide greater protection for the FDMN and host communities through:

- Reducing the vulnerability to natural disasters
- Improving social service delivery system and providing better communication facility through physical interventions
- Improving water and sanitation facilities
- Reducing vulnerability to accidental fire
- Provisioning better educational facilities and
- Strengthening and scaling up of GBV prevention services to the FDMN

The project is jointly being implemented by Local Government Engineering Department (LGED), Department of Public Health Engineering (DPHE) and Ministry of Disaster Management and Relief (MoDMR) under their respective mandate and scope of works. Apart from the interventions in Addressing Gender and Social Inclusiveness and Preventing Gender Based Violence with the Support from UNFPA and building Communication and Awareness among all affected parties through an effective engagement of BCCP (Bangladesh Center for Communication Programs) in the areas, LGED is implementing a good number of infrastructural facilities, namely improvement of hat bazars, roads (both inside and outside of the camps), bridges, culverts, construction of School cum multi-purpose disaster shelters, Satellite Fire Stations, Relief Distribution Center, Community Service Center and many other different types of facilities. Given the project interventions, sensitivity of the areas and volume of people in or around the sites, the project is more likely to trigger certain Operational Policies and Bank Procedures, namely Environmental Assessment (OP/BP 4.01), Natural Habitat (OP/BP 4.04), Forest (OP/BP 4.36) and Physical Cultural Resources (OP /BP 4.11).

[1] ISCG: Situation Report Rohingya Refugee Crisis, (September 27, 2018)

[2] IOM Needs and Population Monitoring round 12 as of October 10, 2018

1.2 Elementary information of Work Package Component of W23.14

It is imperative to recognize proposed components under Work Package-23.12 in Ukhiya Upazila in order to assess and verify its interventions according to stipulated screening requisites from WB. Acknowledging this matter, such details are accounted for as given below in Table 1.2.1 along with visual presentation (General Upazila Map) given in Figure 1.2.1. Aerial map for this component is given in Appendix -5.

Table 0-1.2.1: Basic Featured Information of components [Sources of data: Field survey, 2020: DDC & LGED]

Component's name under W-23	GPS Coordinates	Distance from Upazila HQ	Union	Ward	Project Influence areas locations	Pre-existing condition of Road	Proposed Road type	Road dimension(m) (Length X Width) = Footprint (sq.m) *
Bangamata Mohila college to east sikder bill Road Id:422945079	**Starting Point** 21.24840^0 N 92.14058^0 E **Ending Point** 21.25468^0 N 92.13933^0 E	1 km	Rajapalong and Walapalong	5	Shikdar beel, Gilatoli, Malvita, Taipalong, Gowalmara, Digulia	Partly Earthen, Partly HBB, Partly BFS	Bituminous Carpeting (BC)	(1228mX 4.9m) = 6,017.2 sq. m

*Note: Roads are proposed to have average carriage way of 3.7m with 0.6m shoulder on each side; special conditions may prompt further adjustments while in construction period. However, footprint for roads is calculated with an average of 4.9 meters.

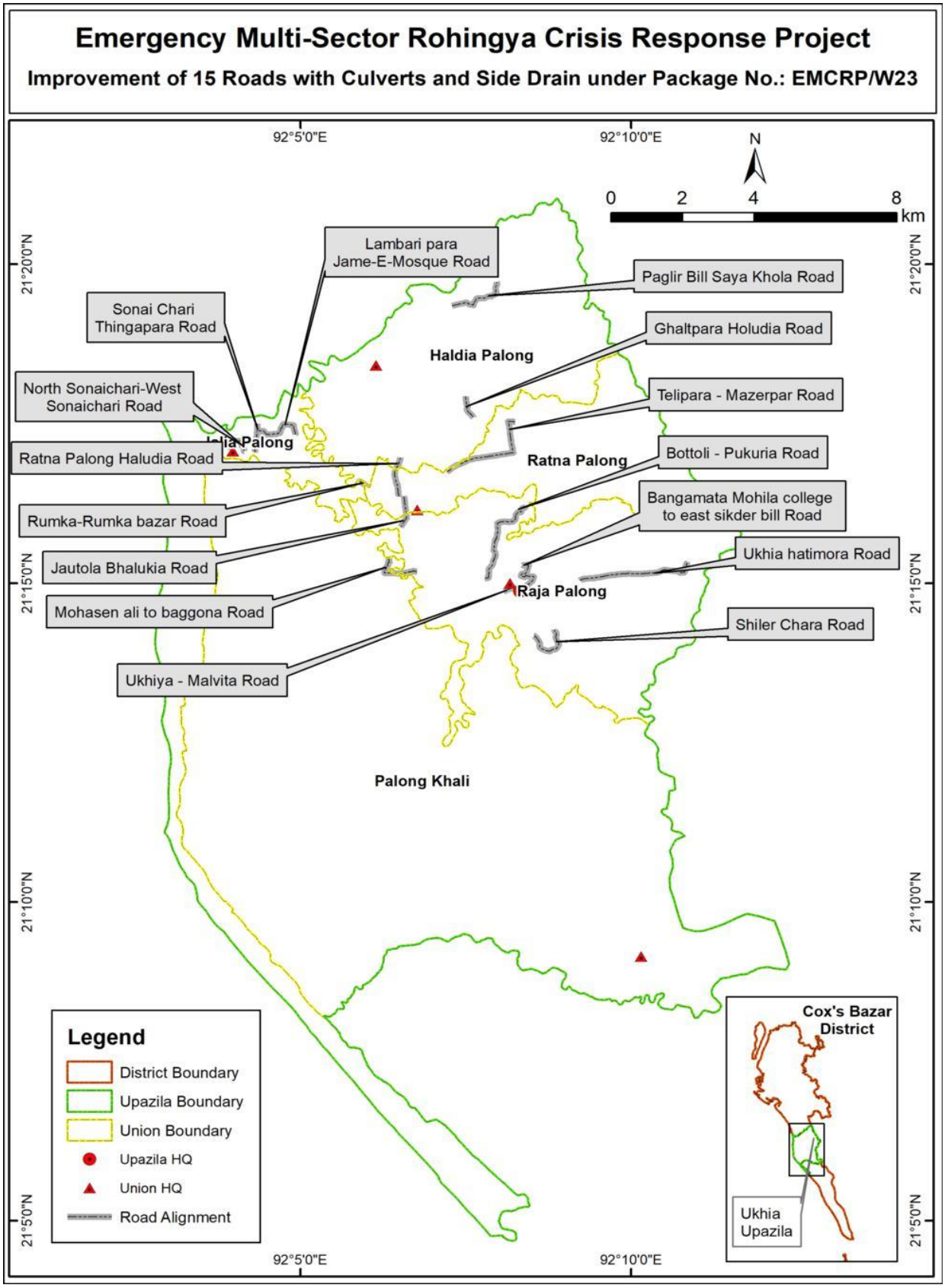


Figure 1.2.1: Map illustrating Bangamata Mohila college to east sikder bill Road Id:422945079 location in the Ukhiya Upazila

1.3 Proposed intervention items for this component

The Bangamata Mohila college to east sikder bill Road Id: 422945079 (W23/14) under work package W23 have been proposed with specific need basis dimensions to accommodate and ensure best quality interventions for local stakeholders. In context of governing environmental circumstances and geo-meteorological conditions, protection work items have been added to construction design for safety and sustainability of each proposed roads. These roads are abutting agriculture hence, construction and improvement works will descent these roads into new circumstances in some parts. These items have been included on the basis of field survey and analysis of these conditions. Please follow the table to acknowledge these items.

Table 1.3.1: Proposed safety interventions of component

W23-14: Bangamata Mohila college to east sikder bill Road Id:422945079
03 nos. Cross Drain (dimension: 0.975mX 0.975m) at Ch. 770m, Ch. 805m, Ch. 1024m and **03 nos. Cross Drain** (dimension: 0.750mX 0.750m) at Ch. 110m, Ch. 313m, Ch.431m, and **04 nos. RCC Box Culverts** (dimension: 2.0mX2.0m) at Ch. 243m, Ch. 530m, Ch.710m, Ch.1278m, **13m RCC U-Drain** (.600mX.600m), **166.0m L-Drain** at different chainage, **85.0m Toe wall** (2.0 height) and 90**.0m Toe wall**(1.5m height) and **138m RCC Palisading (brick) work**, **19.0m brick Toe wall**(1.0m height). **Road safety** work and **Environmental Mitigation and Enhancement** works are also included. Description of safety works and environmental enhancement works can be found in BOQ attached in Appendix-03.

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS

2.1 Methodology

Public participation and community consultation have been taken up as an integral part of environmental assessment process of the project. As part of the impact assessment, participatory public consultation was conducted in areas of concern for proposed roads by the field level staffs and consultants from PIU and D&SC. The consultation meeting was attended by disparate social groups representing local habitants, separate age groups, social class and occupations. In some cases, IUCN employees in charge of elephant watch tower were present where frequent elephant movements occur. The participants were also selected from different segments of stakeholders, and some of whom will have major active roles before, during and even after the construction works. Therefore, the meeting was organized in an informed, expressive and unbiased manner, wherefrom different views and concerns came across which will be properly taken care of during the design and construction phases. In order to serve our screening process, relevant items were thrown towards the audience to discuss and troubleshoot confusing or worrying matters regarding the proposed intervention under package work. Impacts in regards to environment, socio-economic matters during pre-construction, construction and post construction phase have been put forth. Possible mitigation measures and relevant needs have turned out during these sessions as well. Moreover, their comprehension as a stakeholder has been up lifted in light of project guidelines.

However, public consultation is a living process as the types of problems/ difficulties, involved parties or stakeholders and mode of settlement or resolution processes are more likely to differ with

time. Thus, consultation with different parties or stakeholders will be continued throughout the sub-project implementation period and records of resolutions, whatsoever and wherever possible, will be kept in writing at the site and made available on any enquiries or requests by all parties concerned.

Most of the possible impacts under this component development have been put through review for locating impediments or possible adversity effecting future environment and socio-economic conditions. In order to comprehend surrounding features and impacts which may stipulate with it, screening has acknowledged having a Project Influence Area (PIA) of 0.5-kilometer radius. Sensitive findings have been identified if any, and relevant mitigation or minimization measures were suggested to subdue such complication for over the project construciton period. Moreover, evaluation was inspired to enhance environmental features and include monitoring initiatives under ESMP budget to ensure exertion of environmental improvement propositions. Contractor's responsibility has been taken into account while identifying possible impacts through sets of intervention accounts. These steps have been initiated strictly following ESMF guidelines and requirements. Environmental screening procedure was motivated by ingredients highlighted in Appendix-2 of ESMF. During survey, detail chainage length of the sub-projects was taken into account for detailing environmental and socio-cultural features within 100 meters buffer zone of both Left and Right side from the center line of the road. Longitudinal intervals of 300 meters have helped to identify positions of sensitive or near-sensitive socio-cutural features. These findings are illustrated in **Annexure-01**.

2.2 Important features/establishments within the PIA

Initial screening process is conducted through direct involvement of PIU and D&SC in the influence area of the proposed component, which allows to raise significant questions and ideas towards participants. In combination of both field walk-through and inputs of audience, a register of existing features is formed. Allow the following table to describe such elements in all the work package components.

Table 2.2.1: Important features within Project Influence Area for W23.14

Component's name under W-23	Direction	Important features/ establishment (approx. distance from the proposed site)
Bangamata Mohila college to east sikder bill Road Id:422945079	North	Notunpara Ziya Chowdhury GPS (200m), Goru bazar Graveyard(200m), Goru bazar mosque(200m)
	South	Ukhiya Govt. High School(600m), Ukhiya Model GPS (600m), Ukhiya Jame Mosque(600m), Households(30m), Ukhya Station(150m)
	East	Range Office(50m), Gilatoli Madrassa(230m)
	West	Malvita Mosque(230m), Malvita Graveyard(230m), Bongomata college(10m)

2.3 Issues and Recommendations raised by the Participants

After inauguration has set in motion, their valuable opinions and remarks came pouring out. At this point, we find our field base knowledge for assessment attributed impact degrees and possibilities. Please follow the table 2.3.1 given below to recognize participants' inputs arranged in relevance with this component. Consultation meeting summary, attendance sheets and pictures of separate meetings with proposed location for this subproject component can be found in Table 2.3.2 and Annexure-02 and Annexure-03 respectively.

Table 2.3.1: Issues and Recommendations raised by the Participants

COMPONENT'S NAME UNDER W-23.14	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
BANGAMATA MOHILA COLLEGE TO EAST SIKDER BILL ROAD ID:422945079	•In Shikdar beel, Gilatoli, Malvita, Taipalong, Gowalmara, Digulia area, this proposed road is previously BC developed in first 200m and rest is HBB and earthen condition. From Ch: 300m to Ch: 600m the road has declined from higher grounds here the road needs toe wall for protection of surrounding low-lying settlements. They feel this improvement with BC is highly needed for them to ensure quality road for better communication facility. • Big vehicles cannot use this road due to having short crest. In some occasions, big vehicles move over towards open fields adjacent of this road in order to pass through. •Possible dust and noise pollution during the construction works. •Safety of children and adults at the sites during construction works. •Elephant movement not present. •Local community wish to have a better drainage system along with the road in order to allow waters from higher grounds to find an uninterrupted pathway not causing harm to nearby households or agriculture fields and wash away top soil of adjacent grounds residing alongside the road. It will protect the top soil for future growth of crops and aid vegetable farming or homestead gardens. Abutting the road, the chainage consists of	• Local people considered that the selected site is suitable for the construction of this road from both the technical and social-environmental (Direct savings in the cost of operating vehicles, time savings by travelers and freight, wider effects can less accident rates, this road is waterproof and also dust free, much more durable) point of view. It will provide better mobility and access to services in due time. •The road should consider water flow during rainy seasons thereby ensuring the construction is not affected by mass water flow. •Enough pathway is expected for vehicle movement so that comfort travel is achieved. •Construction site safety should be ensured to avoid any mishaps or accidents during work periods. •They considered small lumbering and suggested tree plantation initiatives. •They also requested to involve the local community to construction work and they will welcome any outside key labor. •During construction period, alternate route to pass through this area is available. •Since the road is passing alongside homestead gardens and agriculture fields, the intervention will invite air pollution on moderate level during construction period. However, preventive actions and measures can be taken to keep air quality from degrading. •Priority for jobs should also consider women. •Participants, made certain that they will provide surveillance over raw materials and material storage area. •They have also ascertained that the selected site is free from any events related to resettlement and major environmental impacts. The adverse environmental impacts that may come

COMPONENT'S NAME UNDER W-23.14	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
	homestead gardens. These features should not be disturbed in construction period. •The participants have expressed their greater interest for this intervention and believes this will bring nothing but prosperity for the entire catchment dwellers. •Household fences along the road should not be affected while construction • No trees should be harmed for preparation of this road • Available pathway to usher material delivering vehicles • Labor shed availability in the target location • Material storage is available	in the way of air quality, noise, solid waste, occupational health & safety during the construction period, and will be of short duration, yet proper management/conservative options should be adopted. • Open spaces are available along the road which can be used for material storage and labor camp. • Shikder beel road (this connects with Bongomata road) is available as connecting road for material delivery. • Electricity is available and contractor can install tube wells as deemed necessary.

Table 2.3.2: Consultation Meetings Summary

Road Package Number	Date DD-MM-YYYY	Venue	Main Participant Groups	No. of Participants	Remarks (If any)
W23-14	07-10-2020	Borhan Cooling Corner Shop	Host Community	21	W23(4) and W23(14) has the same community. The consultations for these two components were conducted with same audience.

3. ENVIRONMENTAL SCREENING

3.1 General

This section identifies the potential impacts that the various elements of the proposed Project may have on the physical, biological and socio-economic environment within half a kilometer of the radial distance around the site. Environmental Assessment (EA) based on this screening study for the Sub-project has been conducted to identify and determine which potential Project impacts may be significant and therefore require the application of reasonable and effective management and/or mitigation measures.

In order to realize the exact physical, biological, socio-economic and environmental impacts of the proposed sub-project sites and the influence area in regards to the implementation measures, an extensive field visit was carried out in each proposed sub-project PIA. Environmental Screening form, as adopted in **Appendix 2** of the Environmental and Social Management Framework of EMCRP, was administered for identifying the impacts and their extents.

The screening data and information for this subproject component and details screening summary have been formulated and shown in **Appendix-01.**

3.2 Major Findings

A complete view of current environmental conditions of individual sub-projects in relation to interested queries has been congregated in order to understand the degree of impacts corresponding with marked interventions. Interestingly, most sub-project has correspondence with its surrounding features and upholds interchangeable impacts. However, the degree is not an interchangeable factor since scale is not parallel to each of these components which is where, mitigation measure differentiation is implied. There are some cases where unique circumstances have been met with while environmental screening took place which is also accounted for and should be a matter of concern for other parts of the ESMF initiative. The significant issues observed for this subproject component is enlisted in following Table 3.2.1 with pertaining impacts. Moreover, impacts that are adventitious has also been embraced for promoting best practices.

Table 3.2.1: Concerning environmental issues relating to each proposed subproject and influence area for W23.14

COMPONENT'S NAME UNDER W-23.14	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
BANGAMATA MOHILA COLLEGE TO EAST SIKDER BILL ROAD ID:422945079	It is not located within any major environmentally sensitive area.	It will not cause any severe negative effects to the environmental settings of the area neither to important environmental features.
	Construction period will induce air pollution while preparing for bitumen and loading-unloading raw materials. Impacts on air quality during the construction phase may turn to negative. The main impacts include dust generation from crushers, vehicles and the transportation of all types of construction materials.	It will invite waste production which may in turn cause minor air pollution due to deposited dust and airborne particles less than PM_{10}. Dust pollution may slightly suffocate photosynthesis however this can be minimized through regular water sprinkling as suggested in ESMP.
	Noise emission from construction machineries and equipment can cause nuisance to local residents and workers.	The ambient noise level might have potential to increase temporarily and intermittently in the close vicinity of active construction fronts.
	No agriculture, fish farming and significant vegetation coverage is located in the ROW nor does it stand over such items. Nonetheless agriculture fields and homestead gardens/forest are found beside the road.	No agriculture land or any forest coverage will get degraded or lost for construction. Liquid waste such as left-over oils or chemicals might run into these adjacent features.
	Construction works will involve chemical usage and preparation of on-site add-ons to the road.	The runoff from work site may enter existing pond and frustrate the water quality which will

COMPONENT'S NAME UNDER W-23.14	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
	Generating scraps and residues.	be acute however.
	Few amounts of bush (sapling) will be cut down during construction phase at different chainage.	No severe damage will occur or damage to habitat will be faced. It can be managed by introducing small plantation incentives around the proposed location.
	Elephant Movement is not present in the vicinity of the subproject location.	No impact is expected
	No heavy earth excavation work will be involved.	Consequently air, noise and dust pollution will be occurred within a small-scale during construction period only.
	Construction related activities and setting up of labor camps along with associated facilities and their management can cause adverse impacts.	Noise pollution from pilling or drilling, air pollution caused by dust or gaseous emissions from vehicle movement, running of motorized equipment and land clearing, odors and soil pollution from leaking of latrines and fecal sludge, will more likely to take place.
	Chemical spills or improper disposal of construction waste materials due to lack of worker training and misconduct of contractor's safety initiatives.	During the construction period, soil may get contaminated from activities such as handling of hazardous construction materials (such as fuel, lubricants, paints, and solid waste and sewage).
	Vibration effects generated from pilling, drilling or other construction works	Any vibration would result in nuisance effects to nearby faunal species, and but will be localized and temporary and will unlikely to result in structural damages to buildings or walls of the adjacent private properties.
	Sensitive environmental, cultural, archaeological, religious sites within 1 kilometer of site includes including Notunpara Ziya Chowdhury GPS (200m), Goru bazar Graveyard(200m), Goru bazar mosque(200m) to the north. Ukhiya Govt. High School(600m), Ukhiya Model GPS (600m), Ukhiya Jame Mosque(600m), Households(30m), Ukhya Station(150m) to the south. Range Office (50m) and Gilatoli Madrassa (230m) to the east. Malvita Mosque(230m), Malvita Graveyard(230m), Bongomata college(10m) to the west.	No disturbance to all these establishments/features is anticipated due to construction activities for the sufficient distance from the construction site, and strict construction site management system-including restrictive work schedule during the daytime only, water-sprinkling twice a day on and around the site, safe storage of materials, etc.

A few incidents of human elephant conflict have been reported in 2018. The IUCN has conducted a study on such conflict. With the support from UNHCR, IUCN has been marking elephant routs and corridors and informing local communities and stakeholders of avoiding the marked areas. As part of the mitigation options, different initiatives have been undertaken, such as formation and capacity development of Elephant Response Teams (ERTs); providing equipment to ERTs to divert in-coming elephants; and setting up elephant deterrent tools (e.g. trip alarms and watch-towers). Though the current chances of occurrence of conflicting incidence are zero, any recurrence would be managed

by the ERTs and they will be called if there appears any minute possibility to recur. A map of elephant movement is given in Annexure 04.

In order to offset the loss or attenuating the environmental degradation, a set of mitigation measures will be adopted, on top of general practice of standard construction procedure or following the relevant codes of practices.

3.3 Climate Change Impact Screening

3.3.1 General Overview of the area

Cox's Bazar is one of the coastal districts of Bangladesh and is prone to the effects of climate change due to its geomorphological siting and climate induced effects. The hilly tracts of Cox's Bazar could foster further environmental crisis brought on by indiscriminate deforestation and diminishing groundwater reservoirs, which have been taken place in recent months as the Rohingya crisis evolved. A recent study conducted by World Bank[3] has found that Cox's Bazar will be the worst-hit district in South Asia as average temperatures rise and rainfall patterns become disruptive, by 2050, if greenhouse gas emissions continue unabated.

The hilly region of the country, especially the part in Cox's Bazar is characteristically of muddy soil structure, not of any rocky formation and the stability comes from the roots of the trees. Also rainfall, proximity to the sea, elevation, and land cover are very important factors for analyzing the risk of cyclone. Denudation of trees from hilltops in order for the huge settlement of Rohingya people has already increased the vulnerability to the risk of hill collapse by destabilizing the terrain. Also deforestation at a rapid speed uncovers the land and raise the risk of occurrence of cyclones, as forests protect land from high wind and storm surges where demolishing the trees would make the area vulnerable.

Together with the above-mentioned hazardous situation, again due to sudden extraction of huge amount of groundwater, availability of potable water from shallow tube wells that pump water up from about 150 feet has already reached to a critical level. Averting the problem requires new tube wells to be plumbing deeper into the poorly mapped aquifer, but going deeper than 700 feet in some places may cause salt water to contaminate freshwater resources.

In this case, it is possible that a stationary position of the freshwater-saltwater transition zone can be established via proper management of pumping in the confined aquifer.

The groundwater resource is seen to suffer more from the climate change impact. The impact on groundwater due to climate change impact include

- Sea-level rise could result in a transgression of the sea and a loss of land area. This could also lead to the secondary effect of population migration in the new coastal band due to migration of the coastal population from the encroaching sea, thereby increasing domestic water needs in the new coastal area.

[3] https://openknowledge.worldbank.org/bitstream/handle/10986/28723/9781464811555.pdf

- Transgression of the coast implies that saline storm surges of 1 or more meters depth would penetrate beyond the new coast to new land areas. Storm surges transport saline water far inland of the coast and much of this floodwater may infiltrate the ground in areas where the aquifer is not fully saturated. Even where the aquifer is saturated, denser saline water may sink into the aquifer during the flood and later from pools of saltwater that remain following the flood[4].

- It has been identified that the salinity is found in the shallow aquifers along the coastline. So the salinity which are found in the groundwater are of lesser concern as salinity will subside over time

- Several researches show that through modeling of groundwater flow that the depletion of groundwater in the host community will persist up until 2022 and the replenishment of water will take place.

Considering the general climate change effects in Cox's Bazar area and offsetting the aggravating environmental situation due to the mass arrival of Rohingya communities, several specific measures including tree planation in sub-project areas, rainwater harvesting from every disaster shelter, construction of drainage facilities along the road length and installing thunder arrester across the areas, have been suggested and will be implemented.

3.3.2 Site Specific Screening and outcome

Climate Change impact on a particular subproject is tough to deduce as the highest resolution of climate model simulation done over Bangladesh is 50km. Depending on the simulation ensemble of Cox's Bazar district, the temperature and precipitation are likely to increase with time.

Site specific climate change impacts are often not so easy to measure or deduce plausibly while the site is confined to a narrow strip of roadways, and associated mitigation or offsetting measures are really hard to plot on the impact areas, though an overall set of measures are often considered in practical aspect. Fig:1 shows the inundation risk map of the subprojects under W-23, none of the subprojects are in vicinity of the severe river flood inundation area. So the risk of flooding is low around the sub-project area

[4] "Implications of Climate Change for Fresh Groundwater Resources in Coastal Aquifers in Bangladesh", World Bank report.2010

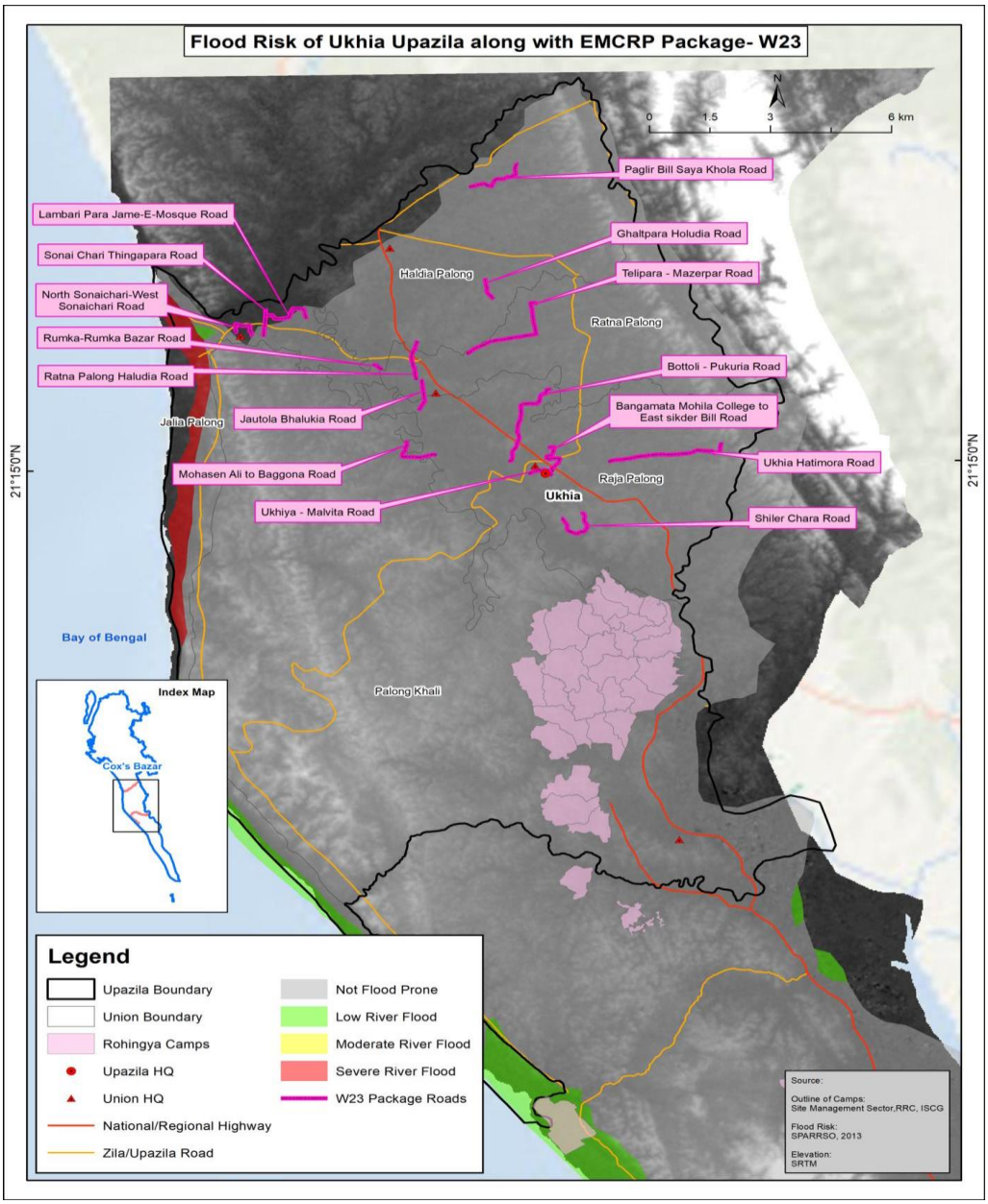


Figure 3.3.2.1: Flood inundation risk map near the subprojects.

Also, in order to avoid the devastation caused by the thunderstorm, state-of the-art thunder arrester (lightning protection system) has been suggested to install having a coverage area of 25,434 sq.m for a single arrester. In addition, tree planation on the road slope/ within the premises is also suggested to sooth the temperature effect and increase the water retaining capacity of soil, at the same time.

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

4.1 General

Considering the environmental settings of the sub-project area, it can be assumed that possible impacts would be largely construction-related, and could be addressed through adoption of good engineering practices; good housekeeping; better *in-situ* construction materials management; and observance of health and safety protocols during the implementation period.

Table 4.1.1: Site Specific Impact and Mitigation Plan under package W23.14

Component's name under W-23.14	Impacts	Mitigation plan
Bangamata Mohila college to east sikder bill Road Id:422945079	There are mostly settlements as shops and households located adjacent to the sub-project and a Range Office (50m) to the east which can be subject to air pollution. However, none are on the ROW.	Contractor must adhere to the best practice debris management procedure and regular adoption of dust control measures (spraying of water at least twice a day) to minimize the effect to the level best.
	Some part of the proposed road is passing by the agricultural land. **Box culvert** and **cross drain** will be constructed to terminate rainwater for one side to another side during rainy season and also help for rapidly remove excess soil water to reduce or eliminate waterlogging during monsoon and return soils to their natural field capacity and will help to maintain the water balance of both roadside agricultural land to provide a sustainable irrigated agricultural system. It will also help to prevent flood and not to allow water to overflow and also help to divert water for farming. Some high land is found beside the road. So, **L-Drain** will be constructed for drainage high land eel water during rainy season. **U-drain** is also considered for drainage facility that runs along the road for uninterrupted water flow. Some low land is found beside the proposed road so **protection wall** and **palisading work** will be constructed during construction period for used to "correct" the natural slope. There are points on the road where slope preparation cannot be done due to having low lying agriculture lands and water bodies. Slope preparation refers to resettlement issues as well in those locations. In such cases **Toe Wall** is proposed which helps to restrain the horizontal surface pressure. This is an adaptation technique and a precaution measure to not allow any damage to sideline existing low-lying features. There are low lands along the road where agriculture fields and ponds are present. This also excludes high chance of soil quality degradation.	**03 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 770m, Ch. 805m, Ch. 1024m and **03 nos. Cross Drain** (dimension: 0.750mX 0.750m) at Ch. 110m, Ch. 313m, Ch.431m, and **04 nos. RCC Box Culverts** (dimension: 2.0mX2.0m) at Ch. 243m, Ch. 530m, Ch.710m, Ch.1278m, **13m RCC U-Drain** (.600mX.600m), **166.0m L-Drain** at different chainage, **85.0m Toe wall**(2.0 height) and 90**.0m Toe wall**(1.5m height) and **138m RCC Palisading (brick) work**, **19.0m brick Toe wall**(1.0m height). **Road safety** work and **Environmental Mitigation and Enhancement** works are also included.

Further construction related activities which may result in adverse impacts in the surrounding environment of the sub project component must be kept under close consideration and appropriate mitigation and management measures will be taken with due care and vigilance. Once the effects are minimized to its least level and controlled efficiently, it will turn into a welcoming and beneficial project for the local communities. The component specific environmental management plans have been outlined in **Appendix-2**. The mitigation measures as well as monitoring program of ESMP have also been incorporated in the management plan.

Environmental quality enhancement: Under the additional financing to the EMCRP project, Forest Department of the Government of Bangladesh will afforest along 200 km of road length area, primarily under the Ukhiya and Teknaf Upazila of Cox's Bazar district in order to offset the environmental and ecological devastation, that had been occurred due to the evolution of Rohingya Crisis, to an achievable level. Many of these road lengths will go through and by the Rohingya Camps, up on the hill and are already denuded of trees or vegetation. Local Government Engineering Department (LGED) will allocate and channelize the finance to the Forest Department under the said additional financing component and oversee the progress of works with due diligence. However, this enhancement work will improve the environmental quality of the area and reinstate some parts of the ecosystem services to those areas, though primarily.

4.2 Health and Safety Measure under COVID Situation

Apart from the established Occupational Health and Safety (OHS) measures being followed in construction sites, offices, and labor camps, a set of additional measures has to be taken and practiced throughout the daily cycle by each labor, staff and any involved parties, due to the ongoing pandemic coronavirus situation. Staffs and consultants at PIU and D&S, along with the pool of consultants under different firms/agencies for different services, and all the representatives or staffs of construction contractors and suppliers have to play much sensitive, (pro-) active and responsible roles in abiding by the rules and measures by themselves and getting the involved workers and different stakeholders adhered to the same. A detailed guideline containing a set of measures with shared responsibilities has been sketched out in order to fight the exposure and further spread of this potentially fatal situation. This plan or guideline shall constitute an integral part of ESMP measures for every sub-project, though is not included in this report to keep it concise and specific, and the contractor is required to keep the copy of that guideline at every site office.

However, among many other relevant issues, the guidelines emphasize on following line of directives:

a. Contractor must designate one of his employees as H&S/Safeguards supervisor to lead, coordinate and interface in order to fight the COVID 19 situation under the direct guidance of COVID focal at PIU of EMCRP project.
b. All workers, supervising and supporting engineers and staffs, consultants, service providers and other concerned parties must adhere to the personal health and hygiene rules, social distancing, and other protective measures in full in order to protect themselves and contain the infections any further. Necessary training and awareness campaign will be aligned with the specific sub-project scenario and prevailing conditions.

c. General practice of cleaning and hygiene has to be maintained in all project/site offices and camp sites, and supply of necessary PPEs and cleaning /disinfecting materials along with proper use of those is to be ensured.
d. Public consultation and stakeholder engagement are to be carried out considering the prevailing risks of virus transmission in the target areas, scope of interventions and level of ICT penetrations among the target stakeholders, and so on.
e. Necessary protocols have to be established and maintained in case of handling a sick employee or worker, and appropriate compensation to a sick disengaged labor is required to be given with due documentation.
f. Budgeting for suggested protective measures, along with necessary supervision and monitoring for the required interventions has to be ensured.

Following the additional health and safety measures presented in that guideline, sub-project component specific BOQ items have been inserted to supplement the budget considering the country-specific situation, capacities, and scope of interventions. The additional cost to Health and Safety Measures under COVID 19 situation is shown in **Appendix-3.**

4.3 Cost of Environmental Enhancement Works in BOQ

In consideration to the above-mentioned environmental impacts and their mitigation measures for this sub-project component, a set of items are included in the BOQ of this sub-project component. Social Safeguard Personnel for Environmental and Social Management for Work Package EMCRP/W23 has also been added in the whole BOQ in order to take supervision and leadership to organize Environmental Management under Environmental Enhancement Works. The total costing and estimation have included enhancements such as Grass turfing plans, Tree plantation initiatives, Dust Suppression mechanisms. On the other hand, in order to ensure health safety and sanitary measures of workers PPE, First Aid Box, Labor shed, Environmental management, drinking water facility with water tests, Temporary latrine for both male and female as well as waste disposal systems has been accounted for. Ensuring sustainable labor performance in regards to environmental and social considerations motivational training has been taken into account. An overview of the estimation is given below and the detailed estimated cost to implement the ESMP is shown in **Appendix-3**.

5. LIMITATION OF THIS STUDY

Bangladesh government has imposed a nationwide lockdown to curb the spread of the novel coronavirus in the wake of series of deaths and infections. Authorities declared a ban on passenger travel on all sector from March 24 while all public transport on roads have been suspended from March 26 to stem the spread of virus, officially known as COVID-19. All office works have been postponed and an intended visit to the sites for further consultation with the relevant stakeholders has had to cancel due to this crisis. Therefore, some relevant information and arrangement needs waiting for recovering this pandemic crisis.

6. CONCLUSION AND RECOMMENDATIONS

The overall conclusion is that if the mitigation, compensation and enhancement measures are implemented in full, there will be no significant negative environmental impacts in regards to the selection of location, design, construction, and/or operation procedure of the proposed component. There will in fact be tremendous benefits from recommended mitigation and enhancement

measures and major improvements in quality of life, opportunities in business, trading jobs and ensuring social safety and security will be achieved once the scheme is in operation.

The conclusions of the Screening study can be summarized as follows:

- The communities will receive large benefits through improved infrastructural facilities, transportation & communication etc.
- The short-term negative impacts that may come by the way of air quality, noise, solid waste, occupational health & safety need to be minimized through the management plan.
- The project will create employment for those who live in the vicinity of the construction site and will provide them a short-term economic gain.
- The green belt development, if necessary, for the road site, with large-growing trees at the periphery of the site will give the places a more natural and pleasing appearance.
- A comprehensive Environmental and Social Management Plan (ESMP) has been prepared to mitigate and reduce the adverse impacts that will come out from the Subproject activities.

Implementation of this component will have large positive impacts to the communities in terms of improved infrastructural transportation & communication facilities, which would eventually develop the socio-economic condition of the catchment areas. So, strong recommendation should be put in place to implement the sub-project within shortest possible period of time, and with great care and efficiency.

Annexure-01: Important Environmental Features (IEFs) near site

Detail Environmental features within 100m of the both sides from the center line were collected @300m longitudinal intervals. The findings of the survey for the aforementioned road can be seen in the table below:

Table: Detailed Chainage length and features of the Sub-Project component

Road Name	Bangamata Mohila college to east sikder bill Road Id:422945079 **(W23-14)**	**Total Chainage**	1228.0m

Chainage (m)	**Left**	**Right**	**Features**
000-300	L		Tin fence, bush, settlement, household, guide wall, household connecting road to the left, trees, road turned right, Bongomata mohila college, tin fence, bamboo fence, electric pole, household, tin fence, low ground,
		R	Building, shop, tin fence, guide wall, tree, solar lamp, tin fence, bamboo bush, bamboo fence, trees, household, low ground, tin fence, household, tin fence
300-600	L		Tin fence, wired fence with RCC pole, household connecting road to the left, low ground with bamboo garden, tin fence, household, tin fence, bamboo fence, electric pole, household, small trees, households, bamboo fence, households on high ground,
		R	Tin fence, brick wall, household, tin fence, bamboo fence, households, bamboo fence, shop, tin fence, household, bamboo fence, households on low grounds
600-900	L		High grounds with households, bamboo trees, brick wall, households, crop field, guide wall, households, trees, bamboo trees, high ground, households, bamboo trees, households on high ground, settlements, bamboo tree,
		R	Households, bamboo fence, bamboo trees, shop, culverts, tin fence, brick wall, households, brick wall
900-1228	L		High ground, bush, settlements, settlements, (road turned left), bamboo fence, trees, electric pole, crop field, electric pole, crop field, trees, bamboo fence, swamp, open space, brick wall, household, shop, high ground, bamboo fence, crop field, crop field, (the road turned left), crop field
		R	Tin fence, brick wall, settlement, electric pole, bamboo fence, household, tin fence, settlement, crop field, pond, mosque

Annexure-02: Attendance of consultation meetings for W23/14

EMCRP/W.14

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)

জরুরী ভিত্তিতে রোহিঙ্গা সংকট মোকাবেলায় মাল্টি সেক্টর প্রকল্প

Local Government Engineering Department (LGED)

Public Consultation Participants List

Focus Group Discussion

সময়: 2:15 P.M তারিখ: 07/10/2020

উপ-প্রকল্প/কার্যক্রমের নাম: Bangamata Mohilla college to east Sinkin Bill Road

যে স্থানে হচ্ছে: Borhan Calling Corner Shop, Malvita

ইউনিয়ন: Rajapalong ওয়ার্ড নং: 05 মৌজার নাম: Ukhiya 4750 উপজেলা: Ukhiya জেলা: কক্সবাজার

সাব প্রজেক্ট নং: EMCRP/W23:14

অংশগ্রহণকারীদের তালিকা (পরিচয় ও স্বাক্ষর)

ক্রম নং	নাম	বয়স	পুরুষ/মহিলা	গ্রাম	স্বাক্ষর / টিপসই
০১	মোঃ আবদুল আজিজ	৬০	পুরুষ	আমতলি	
০২	মরজুম বিবি	৫১	পুরুষ	11	
০৩	কুদরত আলম	৬০	11	11	
০৪	মোঃ কবির	৫৫	11	11	
০৫	মোহাম্মদ ইলিয়াস	৪৮	11	11	
০৬	ফজিল চৌধুরী	৬২	11	আমতলি	
০৭	(মোঃ) কুদ্দুস আলম	৬৫	11	বিজয়ের চিন	
০৮	কুদরত আলম	৬০	11	11	
০৯	কুদ্দুস আলম	৪২	11	11	
১০	কুদ্দুস আলমিন	৬৯	11	11	
১১	মোঃ ইলিয়াস	২০	11	11	
১২	ইসাকুর	৬২	11	11	
১৩	মোঃ ইব্রাহীম খলিল	২৯	11	11	
১৪	সিরাজুল করিম	৪২	11	11	
১৫	কুদ্দুস হক	৫৬	11	11	
১৬	নুরুজ্জামান ওসমান		mup	//	
১৭	মোছাঃ শিমাছোয়ার আক্তার	২৩		11	
১৮	সুরবিদা	৬০	11	11	

EMCRP/W23.14

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)

স্থানীয় সরকার প্রকৌশল অধিদপ্তর

Local Government Engineering Department (LGED)

Public Consultation Participants List

Focus Group Discussion

সময়: 02:15 PM তারিখ: 07/10/2020

উপ-প্রকল্প/কার্যক্রমের নাম: Bangamata Mohilla college to east Sinder Bill Road

যে বিষয়ে হবে: Borhan calling Corner shop, Malvita

ইউনিয়ন: Rasapalong ওয়ার্ড নং: 05 জেলা: Ukhiya উপজেলা: Ukhiya জেলা: কক্সবাজার

সাব প্রজেক্ট নং: EMCRP/W23.14

অংশগ্রহণকারীদের তালিকা (পরিচয় ও স্বাক্ষর)

ক্রম নং	নাম	বয়স	পুরুষ/মহিলা	গ্রাম	স্বাক্ষর / টিপসই
১৯	মোঃ আবদুল হক	৭৮	পুরুষ	বিজয়ার ছড়া	
২০	মইনুল ইসলাম	৩১	"	"	
২১	মোঃ আবদুল্লাহ	৪০	"	"	

Figure: Attendance of consultation meeting for W23-14

Annexure-03: Pictures of sub-project component location and surrounding features with public consultation













Figures: Present condition of Bangamata Mohila college to east sikder bill Road Id: 422945079 (W23-14) & Public Consultation meeting with Host community

Appendix-1: Environmental Screening Form for examining sub-project component

Environmental Screening Form for Sub-project W23-14

Sub-Project Description Form:

EMCRP/W23- Improvement of 15 roads and construction of culverts with side drains under Cox's Bazar District

Name of Sub-Project: Bangamata Mohila college to east sikder bill Road Id:422945079

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Estimated total cost of sub-project (in Taka): 417,036,298.10 Tk.

Estimated construction period duration: 1 year

Estimated total cost of the component (in Taka): **19,288,173.80 Tk.**

Estimated Operation and Maintenance period (life of sub-project): Project design life more than 15 (Fifteen) years but Government policies on how long projects can operate in the camps.

District: Cox's Bazar **Sub-District**: Ukhiya **Union**: Rajapalong

Name of Community/Local Area: Shikdar beel, Gilatoli, Malvita, Taipalong, Gowalmara, Digulia

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):

The Sub-Project is categorized as a village road-A with a proposed design of Bituminous Carpeting through construction of Earth Work. Interventions include **03 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 770m, Ch. 805m, Ch. 1024m and **03 nos. Cross Drain** (dimension: 0.750mX 0.750m) at Ch. 110m, Ch. 313m, Ch.431m, and **04 nos. RCC Box Culverts** (dimension: 2.0mX2.0m) at Ch. 243m, Ch. 530m, Ch.710m, Ch.1278m, **13m RCC U-Drain** (.600mX.600m), **166.0m L-Drain** at different chainage, **85.0m Toe wall** (2.0 height) and **90.0m Toe wall** (1.5m height) and **138m RCC Palisading** (brick) work, **19.0m brick Toe wall** (1.0m height). **Road safety** work and **Environmental Mitigation and Enhancement** works are also included. Road safety works are also included in the project activity.

Estimated footprint / land area for this sub-project is 6,017.2 sq. meter

Brief description of sub-project site: (e.g. present land use, Important Environmental Features (IEFs) near site, etc.:

Proposed road is situated within the catchment area of Shikdar beel, Gilatoli, Malvita, Taipalong, Gowalmara, Digulia stretching 1228 meters. This road starts from Forest road and ended in the middle of Malvita (in the west) and Shikder Beel (to the north). Being one of the local communities of Ukhia upazila these locations are very familiar to any other part of rural Bangladesh having mosques, village households, agriculture fields to grow crops and vegetation that serves as subsistent gardening. The surrounding area is dominated with agriculture practices as rice production, betel leaf production, vegetable farming etc. Majority of the surrounding space of this intervention is covered with homestead gardens and forests. However, there are no significant eco-sensitive features on the pathway of this proposed road.

Overall Comments

The proposed component of the sub-project (Road construction) is not located within any remarkable environmentally sensitive area and will not cause any severe affect to the environmental settings of the area, thus not going to create intimidation to important environmental features. No drainage congestion/water loggings have been observed in the road area. But, some local trees like betel nut tree, rain tree, mango tree, bamboo bushes etc., or additional vegetation may need to clear out due to construction activities, with appropriate offsetting measures to be taken. No agricultural productive soil will be used for the purpose. Earth will be compacted for stabilization. The inputs will be mainly at construction phase and limited within project boundary. Moreover, mitigation measures will be taken according to the ESMP for minimizing the air, dust and noise pollution.

It has been revealed that this project's scopes of works do not intend to overtake their area of lodgment and funding entity has no intention to do so. Moreover, other issue has also been brought to their attention that drainage system and a bridge have also been included into the evaluation of this project since runoff from higher grounds are also a concerning matter during rainy season.

People of the subproject area are very much optimistic about the success of the project and are also eager to participate in the project activities. The subproject is environmentally sustainable and socially acceptable. The local community attended in the participatory public consultation meeting. Their community representatives as teachers, shop owners, farmers and elders have no objection to the construction this infrastructure in the proposed site; the community also appreciated the initiative of LGED to ensure safe access and better portability. The public consultation meeting results confirmed that improvement of this road will increase socio-economic interest in the communities and make lives easier for these people. They also requested to construct the road in accessible width so that small auto and motor vehicles can pass easily. On another matter, locals requested to involve the local community to construction works and material storage monitoring duties.

The road is not located within any identified environmentally sensitive area, and therefore, does not seem to cause any adverse impact on the important environmental features. No significant impact is expected on the ecosystem and biodiversity, no agricultural land/ activities or fish farming will be disturbed, due to the construction of the sub projects. Only forest is found as homestead forest on high grounds of the location.

Types of waste to be generated during construction and operation phase:
During construction period solid waste will be generated due to construction activities. The types of wastes are brick pit, unused sand, wood, gravels, bitumen etc. The types of wastes are gravel, stones, rock, wood, copper wires, concrete, iron, plastic etc. Negligible amount of plastic will come as residue. Moreover, liquid waste will include chemicals of bitumen leftovers, motor oils, used oil, Degreasing solvents etc. Human wastes and kitchen wastes will be generated from labor camps as well.

Sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site including elephant migration routes and remaining forests:

Within the influence area of the subproject no historical sites were identified. Sensitive environmental, cultural, archaeological, religious sites within 1 kilometer of site includes including Notunpara Ziya Chowdhury GPS (200m), Goru bazar Graveyard(200m), Goru bazar mosque(200m) to the North. Ukhiya Govt. High School(600m), Ukhiya Model GPS (600m), Ukhiya Jame Mosque(600m), Households(30m), Ukhya Station(150m) to the south. Range Office(50m), Gilatoli Madrassa(230m) to the east and Malvita Mosque(230m), Malvita Graveyard(230m), Bongomata college(10m) to the west. Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists.

Mostly human settlements are found around the sub-project area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). Elephant migration routes were about 5-6 km away from this sub-project. No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below

Section A: Sub-Project Overview

Description of sub-project/component interventions:

This intervention will include the following items;

- **03 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 770m, Ch. 805m, Ch. 1024m
- **03 nos. Cross Drain** (dimension: 0.750mX 0.750m) at Ch. 110m, Ch. 313m, Ch.431m,
- **04 nos. RCC Box Culverts** (dimension: 2.0mX2.0m) at Ch. 243m, Ch. 530m, Ch.710m, Ch.1278m,
- **13m RCC U-Drain** (.600mX.600m)
- **166.0m L-Drain** at different chainage
- **85.0m Toe wall** (2.0 height)
- **90.0m Toe wall** (1.5m height)
- **138m RCC Palisading** (brick) work,
- **19.0m brick Toe wall** (1.0m height).
- **Road safety** work and **Environmental Mitigation and Enhancement** works are also included (description of such items can be found in BOQ)

Sub-project Location:

Important Features	
ID	422945079
District	Cox's Bazar
Upazila	Ukhiya
Union	Rajapalong
WARD	05
Proposed Chainage	1228m
Road Type	Village Road-A
Proposed Intervention Type	BC
Distance from Upazila HQ	1km

Road Starting Point Coordinates and name	Latitude: 21.24840^0 N Longitude: 92.14058^0 E Road starts from Forest Road
Road Ending Point Coordinates and name	Latitude: *21.25468^0 N* Longitude: *92.13933^0 E* Ends in Malvita and Shikdar beel

Land ownership
Government Land

Expected construction period: 1 Year

Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water bodies, etc. and historical or socio-cultural assets): Please also explain any analysis on alternative location was conducted:

Notunpara Ziya Chowdhury GPS (200m), Goru bazar Graveyard (200m), Goru bazar mosque (200m) to the North. Ukhiya Govt. High School(600m), Ukhiya Model GPS (600m), Ukhiya Jame Mosque(600m), Households(30m), Ukhya Station(150m) to the south. Range Office (50m), Gilatoli Madrassa (230m) to the east and Malvita Mosque(230m), Malvita Graveyard(230m), Bongomata college(10m) to the west. Within the influence area of the subproject no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (checked with local IUCN representative).

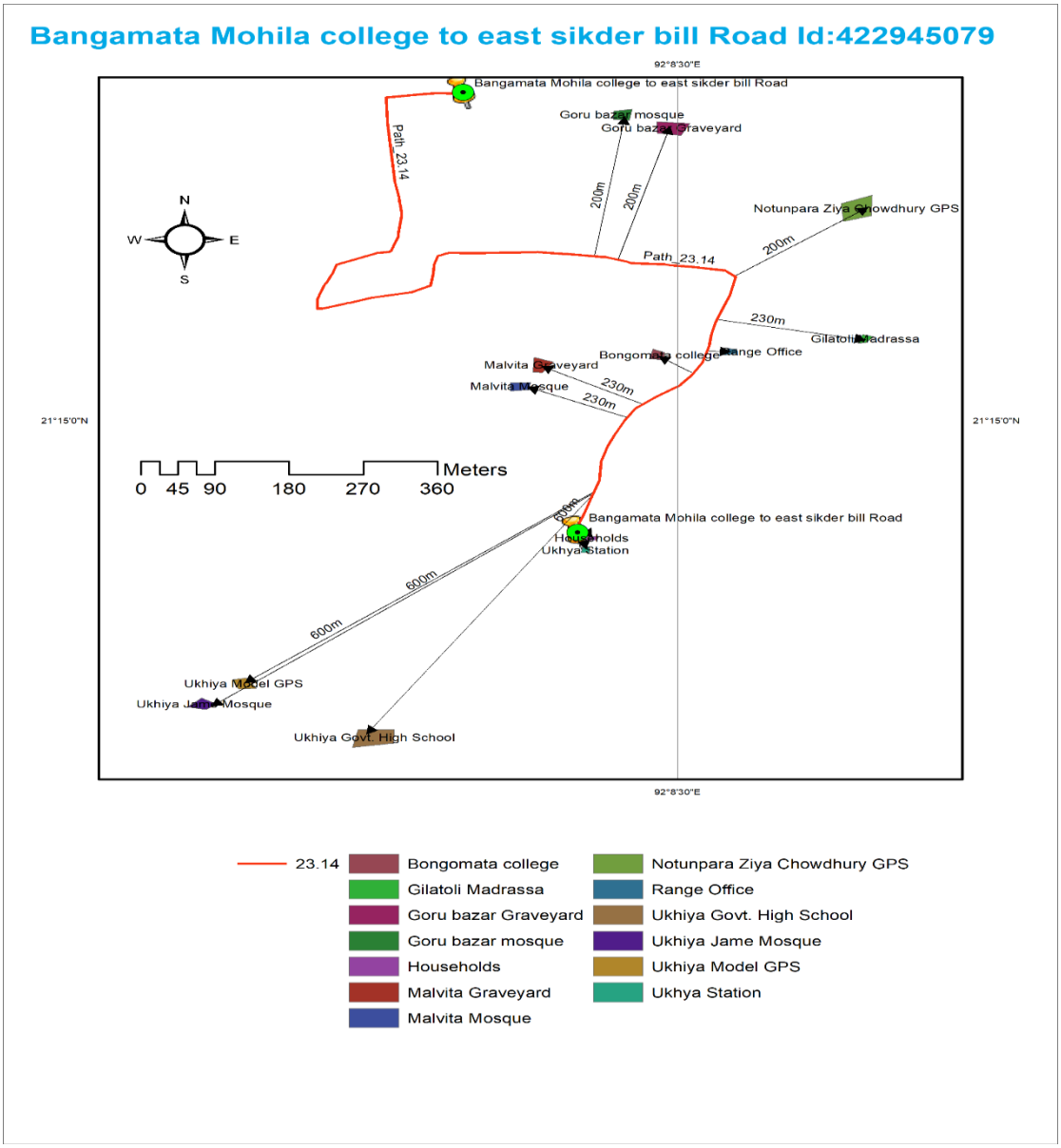
Section B: Environmental Screening

***B.1*: Environmental feature of sub-project location**

Description of cultural properties (if applicable, including distance from site):
Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests:

Notunpara Ziya Chowdhury GPS (200m), Goru bazar Graveyard (200m), Goru bazar mosque (200m) to the North. Ukhiya Govt. High School(600m), Ukhiya Model GPS (600m), Ukhiya Jame Mosque(600m), Households(30m), Ukhya Station(150m) to the south. Range Office (50m), Gilatoli Madrassa (230m) to the east and Malvita Mosque (230m), Malvita Graveyard(230m), Bongomata college(10m) to the west. There are no other sensitive environmental, cultural, archaeological sites within the catchment area of this sub-project.

A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas (within 30m buffer zone) are shown below.



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive features found in the footprint area, except matured vegetation on the sides of the road which are homestead gardens and forest. Several mosques, madrasa and local settlement were found during the survey. It will not be affected by the construction works, as the activities will be carried out within the existing subproject boundary and necessary preventive and mitigation measures will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*

No. There is no existence of Elephant corridor/ route now, which have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February

2018 and later June 05, 2018).

(2) potential impacts on remaining forests in/around camps Yes/No
N/A (This activity will be confined within the existing subproject boundary)

(3) Other issues: N/A

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:
Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of vehicle-related pollutants 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/ preventable by mitigation measures.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, tractor, trailer, etc. move on roads adjacent to sub-project throughout the day and night generate noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation):

Landslide potential is low. There is low possibility of soil erosion or landslide during construction period of targeted sub-project. The impacts are negative but very small scale, site-specific within a relatively small area and adjustable by mitigation measures.

Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH):

Groundwater is the main source of potable water in the Sub-project area. The shallow depth is about 80 feet to 100 feet and deep tube well depth is 700 to 800 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 600-800ft (Field survey, 2019). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer.

Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to

681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)
Status of wildlife movement: **N/A** (None of the information was found about the wildlife movement in or across the area)
State of forestation: Patches of vegetation containing large and matured trees are present in local and homestead gardens across the road side of the proposed subproject area which are located within 200m radial distance.
Summary of water balance analysis (For water supply scheme only): **N/A**

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g. status of access road or any other facility required for sub-project to be viable): An access point called Shikder beel road (this connects with Bongomata road) is available. It is possible to carry construction materials on these roads to the construction site with limited traffic flow to avoid congestion.
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction: Toilet and water supply facilities will be ensured by the contractor in the vicinity of the construction area for all the components of the sub-project, electric connection will be established with the accommodation facility due for the workforce. Electricity is available in the area.
Possible location of labor camps: Labor camp can be established along the road since there are available open private lands. However, this will have to be done with the consent of land owner under a mutual agreement, with the supervision of the Engineer in charge.
Requirement and type of raw materials (e.g. sand, stone, wood, etc.): i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction.
Identification of access road for transportation (Yes/No): Yes. Shikder beel road (this connects with Bongomata road) is available as connecting road
Location identification for raw material storage: Adjacent to labor camp or different location is available. However, this will need placement on open

fields and should be consulted with local committee. Material storage area must be well fenced and materials will be covered with tarpaulins.
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.): Earth/ mud, plastics, brick chips, dust from bricks during construction of project components will be produce. Also, sludge will be produced from labor camp latrines and kitchen waste mostly composing of organic matters as fiber, starch, carbohydrates and proteins. 10% of the kitchen waste may be classified as plastics or non-biodegradables. Solid waste may amount to 20 kg daily and sludge may amount to 5 kg per day.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g. Solids wastes, liquid wastes, etc.): **Solid waste:** Residual waste from the labor camps will be generated. Equipment maintenance/vehicles on-site and scrap material will occur during construction works which are mostly solid waste. Leftover oils or spills from machinery can be a high probability generating liquid waste. Waste from civil works. And the quantity will be tentatively 150 kg. **Liquid waste**: During construction period fecal sludge will be generated from the labor camp and the quantity would be nearly 6 kg per day, which would be reduced in weight in course of time. Leftover oils or spills from machinery can be a high probability generating liquid waste.
Type and quantity of raw materials used (wood, bricks, cement, water, etc.): **Type:** i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction. **Quantity**: It is difficult to give exact figures of construction waste produced on a typical construction site.
Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards: No vegetation is present in the right of way. Specific soil amount is not needed for the project. The current condition explains that there is no aggregated soil on the right of way.
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) The possibility is Medium, for stagnant water bodies to occur. Because water usage will be higher during the construction period. By default, this area has no water logging troubles due to being natural channels. Moreover, no possibilities of stagnation of water in long run. So, local communities have stated that they do not have severe troubles with mosquitos or other disease vectors.

Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No pre-existing waterbody or drainage is present
Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. Because under this intervention, there is very little scope of damage to terrestrial or aquatic ecosystems or endangered species.
Activities that can lead to landslides, slumps, slips and other mass movements in road cuts: Scope of work leading to low scale effects of landslide. The impacts are negative but short-term and site-specific. It can be managed through mitigation measures.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description) Low, since both sides of the road is more or less similar elevation. The concentrated outflow will be managed since the sub-project has included drains.
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials. The existing HBB and BFS part of the road is adequate for traffic movement however, contractors will have to maintain traffic plan so that local transports do not find it difficult to pass during construction work.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: No
Chance of long-term or semi-permanent destruction of soils: (High/Medium/Low with description) No
Possibility of odor and water, soil quality impacts from SWM and FSM disposal system: (High/Medium/Low with description) No
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) There is no possibility of stagnant water bodies remained for encouraging mosquito breeding and

other disease vectors, during the operation phase.
Likely direct and indirect impacts on economic development in the project areas by the sub-project: Construction or implementation of a road project substantially contributes to the development of the project areas. It surely improves the communication network, reduces the transport time, increases the trade and business in/around the areas, and ensures access to better living conditions with amenities, better educational and job opportunities and health facilities. Thus, the direct and indirect impacts on economic development in the project areas would be enormous by this sub-project.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No existing drainage channels or surface water bodies found in the project area; therefore, no such effect can be anticipated
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. There are no protected areas in or around project sites, and no known areas of ecological interest.
Activities leading to landslides, slumps, slips and other mass movements in road cuts: The entire sub-project component area is nearly flat; thus, no such type of impacts is anticipated.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) No
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: Improved communication will definitely increase the traffic/ vehicular movement, which must increase the light and noise pollution, but air pollution effect will not be increased significantly, as the proposed BC road will reduce the pollution generated from dust on the muddy road, especially during the dry season and if the vehicles are maintained in good conditions

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

Section D: Environmental Screening Summary of the Work Package-W23.14

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
1: Sub-Project Interventions	**Air quality**	Under the subproject intervention the overall score is **low**.	• Limiting earthworks; • Watering of dry exposed surfaces and stockpiles of aggregates at least twice daily, as necessary; • Requiring trucks delivering aggregates or bricks and cement to have tarpaulin cover and Limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Covering of trucks; • Records of air quality inspection;	Visual monitoring of air quality and if requires, air quality test (CO, $PM_{2.5,10}$) once in construction period in winter season.
	Soil impacts	Under the sub-project intervention the overall score is **low.**	• Precautions might be taken when rainstorms are likely, when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms. • The earthwork sites where exposed land surface is vulnerable to runoff shall be consolidated and/or covered. • The material stockpile sites shall be far away from surface water bodies and areas prone to surface run-off. Loose materials shall be bagged and covered. • Channels, earth bunds, netting, tarpaulin and or sand bag barriers	Construction Contractor monitored by Consultant and PIU	• No visible degradation to nearby drainages, • *khals* or water bodies due to soil erosion. • Rain storms in construction phase.	Monitoring as weekly basis.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
			shall be used on site to manage surface water runoff and minimize erosion. • The overall slope of the work areas and construction yards shall be kept to a minimum to reduce the erosive potential of surface water flows elsewhere.			
	Hydrology (surface and groundwater)	Under the subproject intervention the overall score is **low**.	• All precautions to store chemicals/oil/fuel properly so that no chance of spill. • Workers must specify waste dump locations to avoid littering which in turn might negatively affect surface and ground water. • Monitor water quality according to the environmental management plan.	Construction Contractor and monitored by Consultant and PIU	• Areas for stockpiles, storage of fuels and lubricants and waste materials; • Records of water quality inspection; Water Quality Test • (National Drinking Water Quality Standard Parameters)if requires; • No visible degradation to nearby drainages, *khals* or water bodies due to construction	Water quality test (mainly GW) twice during the construction period in six months interval.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
					activities. • Records should be kept and logged.	
2: Pre-construction Phase	**Sanitation, water supply**	Under the subproject intervention the overall score is **low**.	• Provide suitable housing, adequate supplies of potable water, and toilet and bathing facilities within labor camp area for the assigned laborer. • Provide means for disposing of wastewater from toilets, baths and food preparation areas either through a septic tank and soak away, or holding tank with removal by vacuum truck. • Records for any type of training or awareness building sessions must be kept at site.	Construction Contractor and monitored by Consultant and PIU	• Site-specific H&S Plan; • Records of supply of uncontaminated water; • Record of Health &Safety orientation trainings; • Condition of sanitation facilities for workers	Visual inspection by PIU and supervision consultants on monthly basis
	Transportation	Under the subproject intervention the overall score is **low.**	• Contractor should verify vehicles for the suitability of carrying, loading and unloading of materials	Construction Contractor and monitored by Consultant and PIU	• Record of regular inspection. • Record of accidents/incidents	Monthly monitoring.
	Storage of construction materials	Under the subproject	• Orienting concerned person and team assigned for the construction work.	Construction Contractor and monitored by	• List of materials and sources of materials;	During implementation phase, as necessary

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
		intervention the overall score is **low**.		Consultant and PIU		with discussion with PIU, Consultant
3: Construction Phase	**Wastes**	Under the sub-project intervention the overall score is **low.**	• Prepare and implement on-site waste water runoff and labor camp waste management plan approved by PIU and consultants. • Wastes must be placed in the designated bins which must be regularly emptied. These shall remain within demarcated areas and shall be designed to prevent wastes from being blown out by wind. • All waste must be removed from the site and transported to a disposal site.	Construction Contractor and monitored by Consultant and PIU	• Complaints from community; • Regular inspection of waste management activity; • Waste disposal record.	As work weekly progresses
	Cut and fill Activities (Cutting of hill slope and earth removal from borrow areas caused for soil erosion and landslides)	Under the sub-project intervention, the overall score is low.	• During construction cut and fill will be balanced as far as is possible. Designs shall ensure that as far as possible all cut and fill activities are balanced • Proper care will be taken during cutting and filling so that slope or toe of the road embankment remain within the right of way and does not disturb the crop.	Contractor, environmental specialist of D&SC	• Location of road alignment and slope.	Daily as work progresses

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
	Storage of materials	Protected and safety storage to be needed for construction materials storage. Not interrupt natural land contours, disturbance in natural drainage patterns and logging of water and the overall score is **low.**	• With the assistance from site management committee in Camp to identify the storage site and other requirements, which will be approved by PIU and consultants.	Construction Contractor and monitored by Consultant and PIU	• List of materials and sources of materials; • Storage areas for materials and equipment.	Monthly basis during implementation phase, as necessary with discussion with PIU, Consultant
	Removal of Vegetation (May cause soil erosion and their deposition on nearby crop field, affecting soil quality and productivity)	Under the sub-project intervention, the overall score is **low.**	• If during detailed design cutting of trees is required, compensatory plantation for trees lost at a rate of 5 trees for every tree cut. • Prevent workers or any other person from removing and damaging any flora (plant/vegetation) and fauna.	Contractor, environmental specialist of D&SC	• Complaints from community;	Daily

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
	Noise pollution	Under the subproject intervention the overall score is **low.**	• Consultation with affected people; not to operate noisy equipment during working period; • No noisy work after 5.00 pm. • Sound suppression for equipment; • Ear protection for workers. • Conduct noise quality monitoring as per EMP.	Construction Contractor and monitored by Consultant and PIU	• Number of complaints from stakeholders; • Use of silencers in noise-producing equipment and sound barriers; • Noise Level following decibel meter (dB)	Inspection by PIU and supervision consultants on monthly basis;
	Air pollution	Under the subproject intervention the overall score is **low.**	• Water spraying for dust control; construction materials with potential for significant dust generation shall be covered; no smoke emitting equipment; and limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor and monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Records of air quality inspection.	Visual observation and monitoring of air quality during construction period.
	Road Safety and Accidents	Under the subproject intervention the overall score is **low.**	• Erection of suitable signage at construction sites • Direct observation and discussion with local people • Restrict the transport of oversize loads. • Operate construction vehicles to non-peak periods (night) to minimize the traffic disruption. • Enforce on-site and access road speed limits.	Construction Contractor, environmental specialist of D&Sc.	• Complaints from communities, pedestrians	Day basis during work time

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
			• The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc. • Local residents should be kept informed about planned Works			
4. Post Construction	**Road Safety**	Under the issue the overall score is **low**.	• Install traffic signs for speed limit, speed breaker where needed, Mile post and create adequate ***traffic*** detours, and sufficient ***signage*** & ***warning*** signs, Post speed limits and suitable bending on the road. • The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc.	Construction Contractor, environmental specialist of D&Sc	• Road signage and safety instruments at suitable locations and chainage	Immediately after the construction work is over.
	Tree re plantation	Under the issue the overall score is **low**.	• Replantation of trees during monsoon period • Maintain of trees properly • Check survival of trees and replant the dead trees	Construction Contractor, environmental specialist of D&Sc	• Number of complaints from stakeholders; • Records of trees number and tree plantation inspection	Immediately after the construction work is over.
5. Operatio	**Maintenance of road and**	Under the issue	• No advertisement/boardings shall be allowed within the Right of Way	LGED	• Number of complaints from	During Operation under LGED's

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
nal Phase	**assets** (Road accidents may increase due to higher number of vehicles using the roads at increased speeds)	the overall score is **low**.	limits of the project road. • Regular maintenance and cleaning of assets such as sign boards, road safety sign etc. shall be undertaken. • Clear smooth speed breaker/rough surfaces should be clear in views. • Regular maintenance of road surface and shoulders.		stakeholders	regular maintenance program in each 3 years.

* Overall Impact Score: High = Likely to cause long-term E&S impacts; Medium = Likely to cause temporary impacts; Low = Likely to cause little, short-term impacts

**Post-construction phase denotes the time period contractor use to clear and clean up the sites after the construction work is ended, perform tree plantation, grass turfing, and minor rectification till the official handing over the site to LGED, or owner of the site.

Recommendation for further environmental and social assessment and/or site specific environmental and social management plan: Yes

**If yes, please specify what assessments/plans would be required.* Mention some recommendation on E&S assessment …. ESMP

If site specific environmental and social management plan (ESMP) is followed the impacts can be mitigated and monitored. ESMP is attached.

Appendix-2: Environmental and Social Management Plan (ESMP)

ESMP for Access and evacuation Roads; *(LGED/EMCRP-W23.14): Bangamata Mohila College to east sikder bill Road, Id: 422945079*

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
Pre-Construction Stage	Loss of land / and other physical assets	• No land acquisition is allowed within this sub-project activities So, there are no any mitigation measures according to this impact.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of livelihood	• Under this subproject, there is no scope of negative impact of adjacent livelihoods	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Stakeholders Engagement	• All of the project stakeholders should be consulted • Separate community level consultation meeting with the potential affected HHs • Consultation meeting with host communities about the project objectives and scope of works	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of right to access	• Project to ensure thorough analysis of alternatives that access enjoyed by the community remains intact. • In case of unavoidable circumstances, alternative access will be provided.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Site Selection & implementing interventions: Human-elephant conflict	• Selection of sub-project sites and all implementing interventions must take place outside of the elephant corridor/influence area.	PIU	Environmental Consultant of PIU, PSC
Pre-Construction Stage	Site Preparation: Soil Erosion; Alteration of natural drainage	• Our selected sites avoided the low land near the water bodies or natural flow path to avoid the flash flood or any kind or surface runoff.	PIU & Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Tubewell location within the construction site is not near to any kinds of latrine and soaks well which could be contaminated by those. • After completing the development, we restored the place as like before to avoid the cut and fill operational problems. • This site is in the local community, so we discussed with the local community to avoid any conflicts related local habitation, culture. • Sub project intervention mustavoid of natural disturbance of existing slop and natural drainage. • The contractor ensuring sound environment for the local residents near the sub project site.		
Construction Activity	Noise from construction works	• Construction activities mostly will finish at day time within 05 PM, and must confirm proper measures for avoiding any disturbance. • All Personal Protective Equipments (PPEs) must be ensured in sites before starting any kinds of construction works.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Dust	• Acceptable range of emission of CO, particulate matter [SPM (**Suspended particulate matter)**, PM2.5, 10] and Hydrocarbons must be maintained through good construction work practices • Dust generation must be limited as a result of clearing, leveling and site grading operations with using water florescent manually and through water	Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		pipes. • Dust generation due to vehicle movement on connecting road shall be controlled by watering the path at limited level		
Construction Activity	Safety Issues	• Unauthorized entry is completely prohibited in our site and take necessary measures for preventing this problem • Before works started Contractor must provide proper training and guidelines on health and safety issues to the labors and associated staffs. • Records of every training must be kept at site. • All kinds of Child labour are completely prohibited in every site. • Every construction materials storage site will be well fenced by Tin and safety caution tape.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Traffic Management	• Contractors will maintain proper route for traffic management which is to beconsulted with and confirmed by the Executive Engineer of Cox's Bazar.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Conflicts with existing users due to the scarcity of resource base.	• A detailed assessment of the available resources and consent of the local representative for withdrawal of water from existing surface water sources shall be taken. • If ground water is withdrawn, adequate approvals from the appropriate department need to be undertaken before setting up bore wells. • Any type of consent letter or agreement for	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		withdrawing water from either surface or underground sources will be kept on site. • Local community must be consulted before any construction works starts.		
Construction Activity	Increase in road accidents	• Maintain safety measures during the movement of heavy machinery and equipment. • Local community will be trained up on traffic management and awareness.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Labour Base Camp: Conflicts with the local residents	• Awareness building session will be undertaken about prevention of child abuse, child marriage, GBV, sexual harassment, trafficking of women and children as well as illegal drug trade. Written records of this awareness building session shall be kept on site. • Work force should be prohibited from disturbing the flora, fauna including hunting of animals, wildlife hunting, poaching and tree felling. • Adequate facilities ensuring sanitation for labour camps will be put in place • Treated water will be made available at site for drinking purpose. • Adequate accommodation arrangements for labour forces. • Labor code of conduct is to be disclosed through consultation.	Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Construction Activity	Waste Management: Improper management and handling of	Preparation of a waste management plan covering the following aspects:	Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
	hazardous and non-hazardous waste during construction.	• Residual waste from the temporary accommodation facilities for labor Waste and from equipment maintenance/vehicles on-site • After completion of construction works. So, recycling process is not applicable. • Proper consents for hazardous waste management.		
Construction Activity	Health & Safety Risks: • The potential for exposure to safety events such as tripping, working at height activities, fire from hot works, smoking, failure in electrical installation, mobile plant and vehicles, and electrical shocks. • Exposure to health events during construction activities such as manual handling and musculoskeletal disorders, hand-arm vibration, temporary or permanent hearing loss, heat stress, and dermatitis.	• All construction equipment will be properly inspected timely. • The risk assessment will be prepared and communicated prior to the commencement of work for all types of work activities on site. • Preparation of proper walkways and clearly designation as a walkway has to be ensured; all walkways shall be provided with good conditions underfoot; signposted and with adequate lighting. • Proper Signpost at any slippery areas will be ensured in construction site. • Fire extinguishers will be located at identified fire points around the site. The extinguishers must be appropriate to the nature of the potential fire. • This sub project has Proper communicative emergency response plan (ERP) with all parties, the ERP to consider such things as specific foreseeable emergency situations, organizational roles and authorities' responsibilities and expertise, emergency response and evacuation procedure and personnel will	PIU & Contractor	Environmental Consultant as well as Social Development and Gender Specialists of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		be trained and drilled to test and ensure the coherence with the plan. • All people of construction site will be concerned about the safety and maintenance of Electrical equipment; works will be carried out on live systems. • Provision to first aid box in sub-project areas will be ensured. • Proper Emergency evacuation response plan will exist in sub-project area. • All safety equipment will be available in sub-project site (safety, size, power, efficiency, ergonomics, cost, user acceptability etc.), the lowest vibration tools will be provided that are suitable and can do the works. • Awareness training will be given to all personnel involved during the construction phase in order to highlight the heat related illnesses of working in hot conditions such as heat cramps, heat exhaustion, heat stroke, and dehydration. Written records of this awareness training shall be kept on site. • Adequate quantities of drinking water will be available at all Sites, on different locations within the site. • Provision to maintain proper PPE wherever necessary and to ensure that there are satisfactory washing and changing facilities. • Provision to ensure all workers exposed to a risk are aware of the possible dangers and also given thorough		

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		training on how to protect themselves and there should be effective supervision to ensure that the correct methods are being used.		
Operation &Maintenance	Noise disturbances to fauna	• Provision to maintain noise and vibration from the operation and maintenance of machinery and equipment by proper monitoring and measures. • Provision to take necessary lighting, caution for the works and necessary maintenance should be done in day light.	PIU	Environmental Consultant of PIU, PSC. Union Member
Construction activity	Odours and pollution caused by leaking latrines and faecal sludge, and solid wastes impacting surrounding water bodies, flora and fauna	• Preventative maintenance schedule should be followed. • Solid organic wastes should be stored in bins and/ or skips and emptied regularly at a designated waste disposal area away from the camp site. If no designated site is available within the reach, a dug-hole at a nearby place can be used with periodic filling with soil layer for preventing pollution and generating nutrient rich compost soil over time.	PIU	Environmental Consultant of PIU, PSC. Union Member
Decommissioning during the project implementation period (including site clearance after the construction)	The impacts are similar to those listed in construction stage: • Pollution from waste materials • Health & Safety risks to workers and local community	• Contractor must prepare a demolition and waste management plan including following directive aspects given hereunder.	PIU / Contractor	Environmental Consultant of PIU, and Executive Engineer of Cox's Bazar

Waste Management Plan:

The Contractor shall develop a waste management plan for various specific waste streams (e.g., reusable waste, flammable waste, construction debris, food and organic waste etc.) prior to commencing of construction and submit to LGED for approval. The plans must include following principles or series of actions, which will be carried out/followed by the contractor and supervised by the Field level Environmental Specialist and Social Development Specialist.

For wastes:

- The quantity of waste materials shall be minimized by 3R (Reduce, Recycle and Reuse) approach, and wastes shall be segregated accordingly, wherever practical; and stored in designated places/facilities in the site.
- Construction site shall be maintained in a cleaner, tidy and safe condition and appropriate facilities shall be provided and maintained as temporary storage of all wastes before transportation and final disposal.
- Hazardous waste viz. waste oil etc. will be collected and stored in a paved and bounded area and subsequently sold to authorized recyclers.
- The scrap material generated from related construction activities will be collected and stored separately in the stack yard and sold to local recyclers.
- All wastes generated during construction shall be disposed off in an environmentally acceptable manner. This will include consideration of the nature and location of disposal site, so as to cause less environmental impact.
- Other leftover non-hazardous wastes, including construction debris shall be transported to an approved disposal site by pick up tracks or back loaded vehicles with proper care.
- Organic wastes produced in the camp site during the construction period shall be collected and transported in vehicles covered with tarps or nets to prevent spilling waste along the route to the designated disposal site;
- Burning of any type of wastes in the construction site shall be prohibited completely.

Prepared by: Harogopal Kabiraj, Environmental Focal Person, +8801714980171

Tanvir Ahsan Haque, Environmental Specialist, +8801688117059

Ms. Sadia Azad, Disaster and Climate Change Specialist, PIU.

Reviewed by: Md. Saiful Islam, Field Level Environmental Specialist, +8801913442006

Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.14

In consideration to the above-mentioned environmental impacts and their mitigation measures for all sub-projects, individual BOQ for each component has been prepared. Following tables will illustrate such items of enhancement and impact mitigation works as well as considering the emerged situation of COVID-19, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites.

Cost of Environmental Enhancement Works for W23-14 in BOQ

Sl no.	Description of item	Quantity	Unit price	Total amount
1.	**Grass Turfing** Turfing on embankment top and slope & any critical place with good quality turf supplied by the contractor of not less than 225mm square in dimension including placing and watering till grass is fully grown, etc. all complete as per direction of E.I.C. (Payment to be made only when grass is fully grown)	3674 Sq.m	@38.15 Tk. Per sqm	140178.36
2.	**Dust suppression measures** Dust suppression measures like water sprinkling on aggregates/unpaved roads, in and around the work site and as per direction of E-I-C	1228m	@ 2.56 BDT	3143.68
3.	**Water Supply and Sanitation** Providing and maintaining adequate portable water supply, sanitation, and cleanliness facilities at camp site and work site to the entire satisfaction of Engineer-in-charge. **Temporary Toilet:** Construction of temporary toilets in work site/ rest area complete as per design and specifications and approved by the Engineer-in-Charge. There should be 1 camp in each site. In each camp, there should be 1 no of toilet for women and 1 no of toilet for men.	2 nos.	@12822.86 per toilet	25,645.72
4.	**First Aid Box** Supplying, equipping and maintaining adequate first-aid box throughout the working period at worksite and site office, and erect conspicuous notice boards directing where these are situated and providing all requisite emergency medical first aid kits, including complying with the government medical or labour requirements at all times, and provide, equip and maintain	1 no.	LS @5000 Tk. Per box	5,000

	necessary dressing kits throughout the working period for attending minor injuries, etc. all complete as per requirement and full satisfaction of Engineer-in-charge.			
5.	**Drinking Water Facilities** Providing continuous adequate drinking water supply at worksite and site office as well by installing necessary tube-well/s where applicable or any other means depending on local situation, also providing essential arrangement for storing drinking water by supplying portable best quality water tank equivalent to Gazi/Padma of adequate capacity depending on the number of users, including supplying 1 (one) no. best quality water filter of minimum capacity 30 liters with necessary kits, etc. all complete as per satisfaction and direction of the Engineer-in-charge.	2 no.	LS @ Tk. 30,000	60,000
6.	**Traffic Management** Maintaining traffic management at worksite from time of commencement of contractor's activities to time of completion activities, including ensuring that the road is safe for users, providing a safe working area for those involved in work on trafficked network and minimizing any disruption to smooth flow of traffic (this includes providing necessary barricades, warning signs/lights, guide signs, flagmen, maintaining diversion roads by cutting, filling, constructing, etc. or by any other means) in accordance with the full satisfaction of the Engineering-in-charge.	1 no.	LS @ Tk. 15,000	15,000
7.	**Personal Protection Equipment for Workers** Providing and maintaining appropriate (safe design, fit and comfort) personal protection equipment (PPE) to ensure the highest possible protection for employees in establishing and maintaining a safe and healthful working environment at workplace, including demonstrating, providing training on proper understanding and development of skill in the use of PPE, including supplying (i) best quality safety jacket, (ii) suitable hand protection gloves, (iii) appropriate foot protection shoes, (iv) best quality safety helmets, face shields, ear muffs etc. (v) suitable eye protection goggles	LS	LS @ Tk 30,000	30,000
8.	**Tree plantation** Tree plantation to compensate the felled down trees and enhance the ecological condition in the subproject area- preferably local fruits, flowers, medicinal and ornamental trees- Mango, Jackfruit, Jam, Kathbadam, Chalta, Krisnachura, Bokul, Jarul, Polash, Kadom, Shimul, Neem, Arjun,	160 nos.	@ Tk. 1000	160,000

	Amloki, Horitoki, Bohera, Mahogany, Palm Tree, Chambal, Rain Tree, Shil koroi, Satim, Sishu (including protection, fencing and conservation during project defect liability period): Preferably at both sides of Road where space is available (fencing as per LGED rate schedule 5.26.14) (Contractors will also be instructed by the consultant and PIU prior to the tree plantation work) at an interval of 10 feet.			
9.	**Motivation training** Motivation training (twice: before and after construction start) of the Upazila Engineer 'sand Contractor's representatives on safety practice and as per direction of the E.I.C.	1 no.	LS @ Tk. 10,000	10,000
10.	**Waste disposal facility** Temporary camp site waste disposal facility improvement 2 nos. (1 no of organic waste and 1 no of inorganic waste disposal facility) and as per direction of E.I.C.	LS	@ Tk. 5000	5,000
11.	**Water Test (Drinking Water samples)** Water samples are to be collected periodically (half yearly) from the tube well at labor shed area for laboratory analysis of different parameters such as pH, arsenic, iron, chloride, hardness, total dissolved solids, nitrate, nitrite, coliform, electrical conductivity etc. all complete as per direction of E.I.C. (including the cost of actual fees for testing from reputed laboratory and report) as desired by E.I.C.	LS	@ Tk. 5000	5,000
12.	**Working labour shed:** Construction of Labor shed (Size: 30'x20') with C.I sheet Roofing, Tarza fencing and brick soling floor as per requirement and direction of the E-I-C.	1 no.	LS @ Tk. 30,000	30,000
13.	**Environmental management** Environmental management costs of the Environment & Social/ Safeguard Personnel for Environmental and Social Management and Monitoring during construction and operation phase for their salary & transport (Net payment excluding Tax &VAT). And as per direction of the E.I.C. **(One Safeguard Personnel for R3, R5, R7, R11 & R14)**	1 person	Monthly basis @Tk. 35,000.00 for 12 months. One person covering 5 roads i.e.35,000Tk.*12months*(1/5 one road).	84,000.00
	Subtotal Bill: Environmental facilities			**572,967.76**

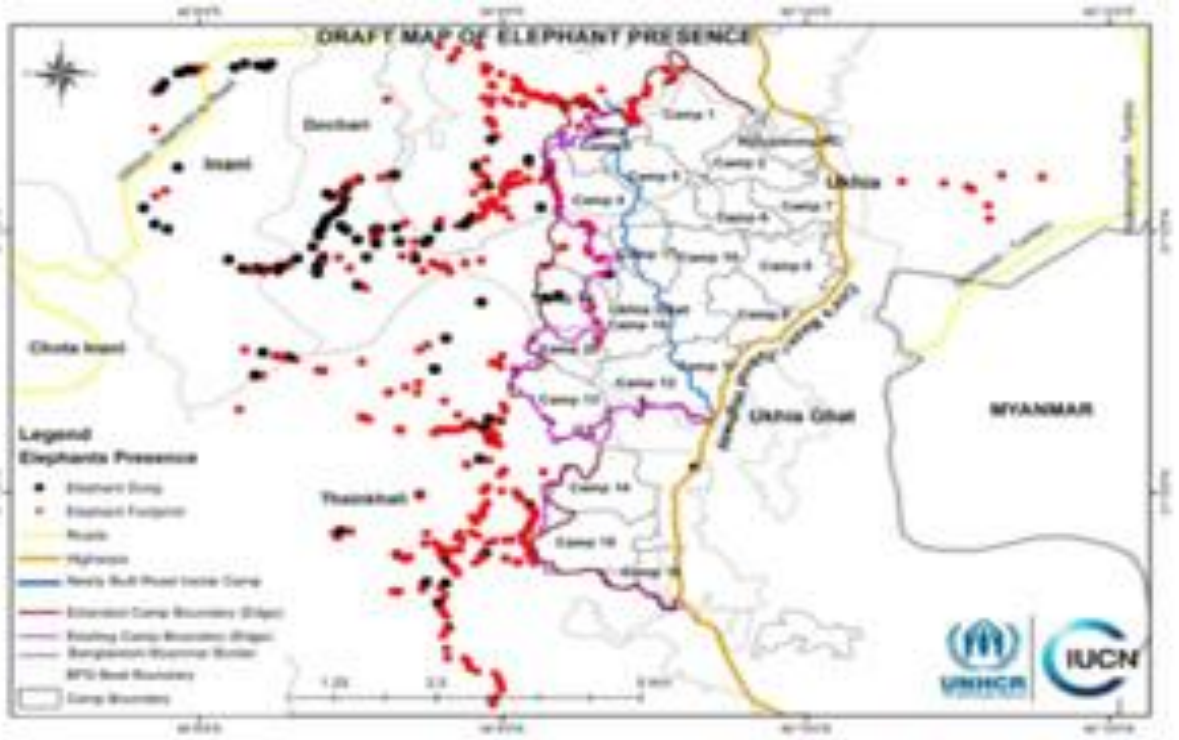
Cost of H&S Measures under COVID 19 Situations for W23-14

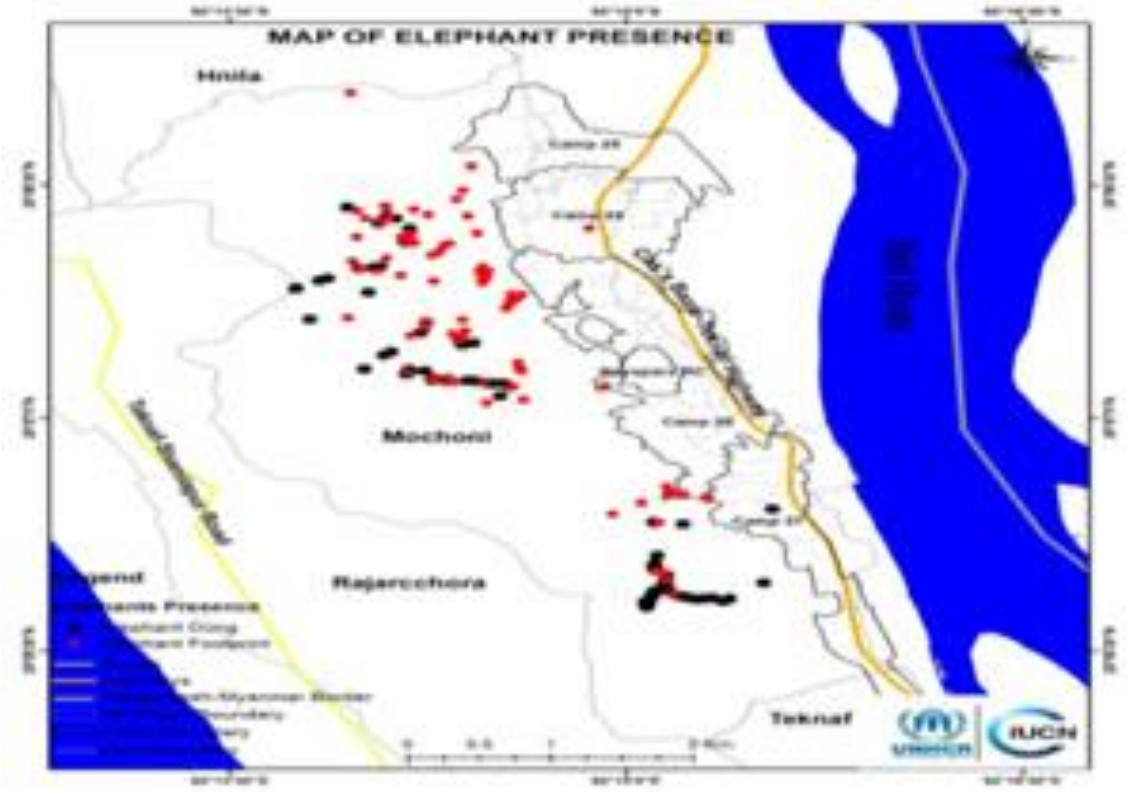
Considering the emerged situation, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites. The cost is estimated counting 15 workers for 270 active working days (9 months in a year) in a contract period for one site under this package (EMCRP/W-23.14).

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
1.	Non-Contact IR Digital Thermometer	01 nos. in each site	N/A	N/A	5,000.00	1	5,000.00	Each site office will have a thermometer for checking body temperature every morning at the entrance of the working site
2.	Wash Basin with Small Water Tank, Bucket and Mug (or piped water supply)	01 nos. in each site	N/A	01 nos. in each camp	10,000.00	2	20,000.00	Wash basin to be installed at favorable locations immediately after the entrance to the facility
3.	Trash bin (covered)/Paddle Bin	01 nos. in each site	N/A	01 nos. in each camp	550.00	2	1,100.00	
4.	Bar Soaps (150 gm each)	41		51	50.00	92	4,600.00	To be placed in a case/holder on the basin, for washing hands for max. 37 people a day and showering of 32 workers in each labor camp.
5.	Hand Sanitizer (2 nos. 250 ml bottle and 5 liter Can for Refill)	2 bottles and 1 Can for each site	N/A	N/A	4,000.00	1	4,000.00	2 bottles and a 5 litre can for each Site office
6.	Face Shield/ Protective Safety	9 nos. for each site		N/A	400.00	9	3,600.00	For labors who work in close contact, 9 in each site

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
	Goggles							
7.	One time Mask (Disposable) for Contractors' Staffs	5 nos. each day in each site		N/A	12.00	1350	16,200.00	Reusing N95/KN95 mask will not be a manageable option in field scenario, one time disposable medical/surgery mask a good option instead.
8.	Cloth mask for Workers	N/A	15 nos. for each labor camp		35.00	270	9,450.00	A worker will use a mask for 15 days with everyday washing
9.	Floor Cleaner (1 litre Can)	1.5 Can	N/A	3 Can	250.00	4.5	1,125.00	
10.	Detergent Cleaner	N/A	1.500 kg in each camp/month		400.00	13.50	5,400.00	To be used for washing clothes, masks and tools & equipment, etc.
11.	Miscellaneous cost				20,000.00	1	20,000.00	Contingency cost for medical emergency and compensation for workers, subject to proper documentation
	Grand Total						**90,475.00**	

Appendix-4: Elephant Migration Routes Map





Elephant presence map (latest information published on 24 May 2018)

Appendix-5: Location Map of Sub-project component

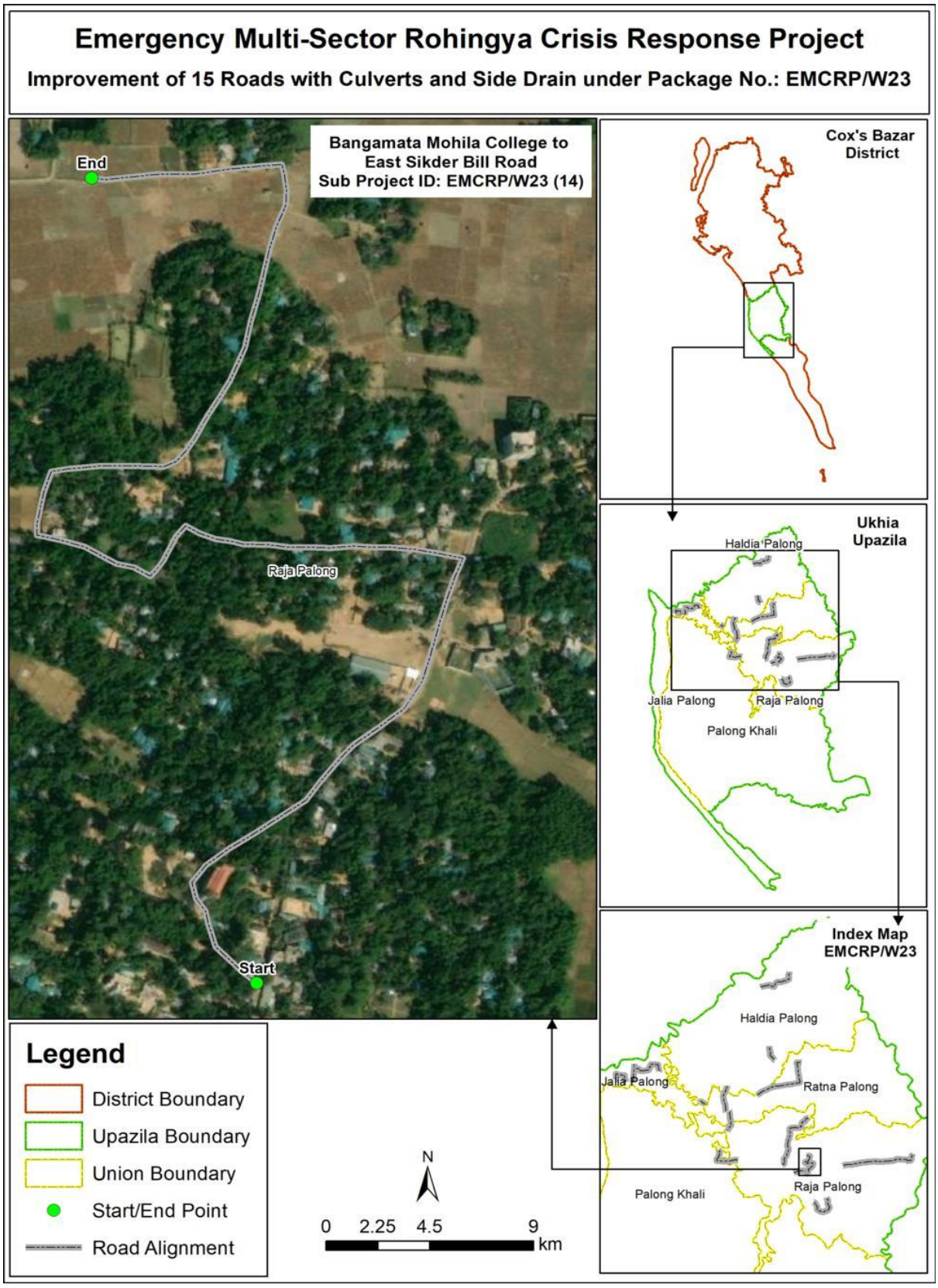
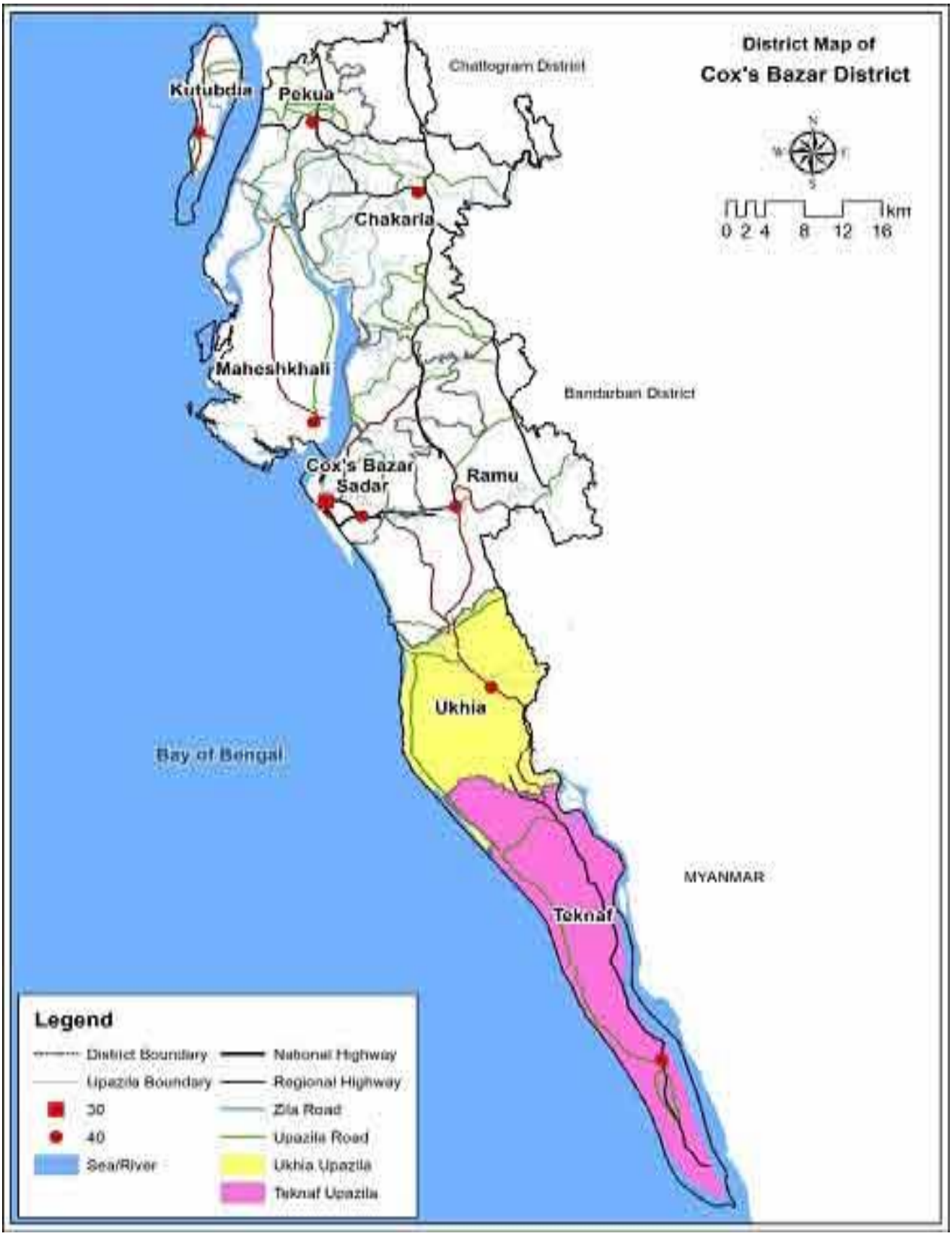
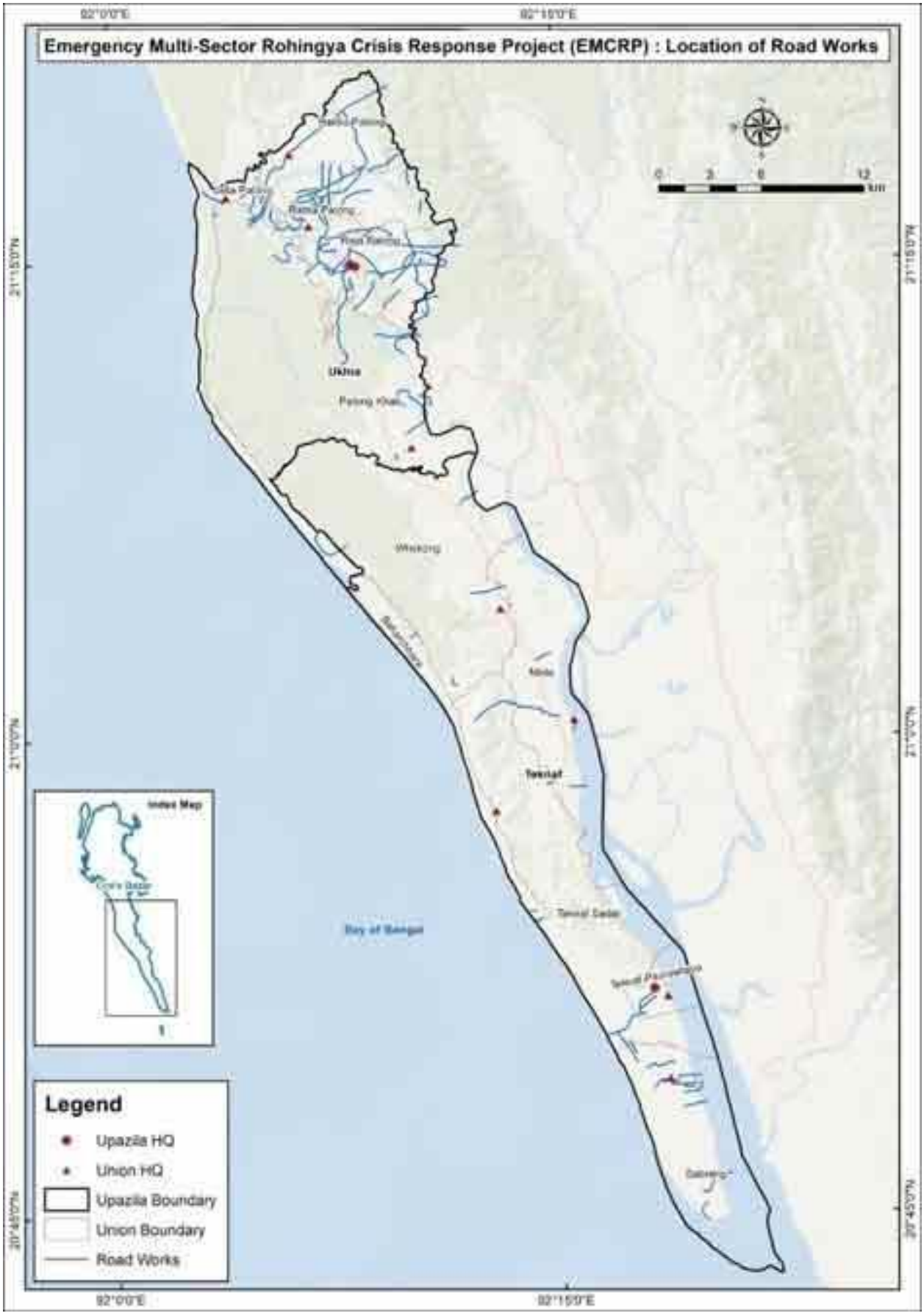


Figure: Location Map of W23-14



District map showing Ukhiya and Teknaf Upazila



Upazila map locating proposed roads

GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH
Ministry of Local Government, Rural Development and Co-operatives
Local Government Division
Local Government Engineering Department

Emergency Multi Sector Rohingya Crisis Response Project (EMCRP)

Project ID: P167762 **IDA Credit No. 5561-BD**





Environmental Screening Report

For Paglir bill saya Khola Road Id:422945082 with culverts and side drain under Cox's Bazar District.

Under the package no. EMCRP/W23

Funded by:

THE WORLD BANK
IBRD • IDA

Government of the People's Republic of Bangladesh & World Bank

Design and Supervision Consultancy:

Development Design Consultants Ltd.

October-2020

Contents

1. INTRODUCTION 1

1.1 Project background 1

1.2 Elementary information of Work Package Component of W23.15 2

1.3 Proposed intervention items for this component 4

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS 4

2.1 Methodology 4

2.2 Important features/establishments within the PIA 5

2.3 Issues and Recommendations raised by the Participants 6

3. ENVIRONMENTAL SCREENING 7

3.1 General 7

3.2 Major Findings 8

3.3 Climate Change Impact Screening 10

3.3.1 General Overview of the area 10

3.3.2 Site Specific Screening and outcome 11

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) 12

4.1 General 12

4.2 Health and Safety Measure under COVID Situation 14

4.3 Cost of Environmental Enhancement Works in BOQ 15

5. LIMITATION OF THIS STUDY 15

6. CONCLUSION AND RECOMMENDATIONS 15

Annexure-01: Important Environmental Features (IEFs) near site 17

Annexure-02: Attendance of consultation meetings for W23/15 19

Annexure-03: Pictures of sub-project component location and surrounding features with public consultation 21

Appendix-1: Environmental Screening Form for examining sub-project component 22

Appendix-2: Environmental and Social Management Plan (ESMP) 41

Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.15 49

Appendix-4: Elephant Migration Routes Map 54

Appendix-5: Location Map of Sub-project component 55

ACRONYMS

BOQ	Bill of Quantities
BFS	Brick Flat Soiling
D&SC	Design and Supervision Consultant
DoE	Department of Environment
DRP	Displaced Rohingya people
EA	Environmental Assessment
EC	Electrical Conductivity
EMCRP	Emergency Multi-Sector Rohingya Crisis Response Project
ESMP	Environmental and Social Management Plan
ERP	Emergency Response Plan
ESMF	Environmental and Social Management Framework
FDMN	Forcibly Displaced Myanmar National
FGD	Focus Group Discussion
FSM	Faecal Sludge Management
GBV	Gender Based violence
GPS	Government Primary School
GRM	Grievance Redress Mechanism
HBB	Herring Bone Bond
IEFs	Important Environmental Features
ISCG	Inter Sector Coordination Group
IUCN	International Union for Conservation of Nature
IWM	Institute of Water Modeling
LGED	Local Government Engineering Department
PIA	Project Influence Area
PIU	Project Implementation Unit
PMU	Project Management Unit
PPE	Personal Protective Equipment
PSC	Project Steering Committee
SMC	School Management Committee
SPM	Suspended Particulate Matter
SWM	Solid Waste Management
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
UNHCR	The United Nations High Commissioner for Refugees
VAT	Value-Added Tax
WB	World Band

1. INTRODUCTION

1.1 Project background

An estimated 730,000[1] people of Rohingya community has fled to neighboring Cox's Bazar district of Bangladesh since August 25, 2017 to escape extreme violence in Rakhine State of Myanmar, which caused the total number of Forcibly Displaced Myanmar National (FDMN) in the district to be about 923,033[2]. This huge number of displaced population account for about one-third of the total population of Cox's bazar, a district which was already facing many development challenges and suffering from resource-constrained social service delivery system even before the crisis evolved and the mass exodus of FDMN has worsened the situation further. Almost all of these displaced people are hosted in Ukhiya and Teknaf Upazila of Cox's Bazar, in extremely congested settlements in areas having very minimal access to basic infrastructure and services and is prone to natural disasters. The Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP) has been designed in order to reduce the vulnerability of Forcibly Displaced Myanmar National (FDMN) along with people from the host communities in Teknaf and Ukhiya Upazila under Cox's Bazar District, to different disasters and improve the social service delivery system and disaster resilience to both the communities. This project will follow a sustainable development pathway that is resilient to disaster and climate change effects.

The objective of the Project is to provide greater protection for the FDMN and host communities through:

- Reducing the vulnerability to natural disasters
- Improving social service delivery system and providing better communication facility through physical interventions
- Improving water and sanitation facilities
- Reducing vulnerability to accidental fire
- Provisioning better educational facilities and
- Strengthening and scaling up of GBV prevention services to the FDMN

The project is jointly being implemented by Local Government Engineering Department (LGED), Department of Public Health Engineering (DPHE) and Ministry of Disaster Management and Relief (MoDMR) under their respective mandate and scope of works. Apart from the interventions in Addressing Gender and Social Inclusiveness and Preventing Gender Based Violence with the Support from UNFPA and building Communication and Awareness among all affected parties through an effective engagement of BCCP (Bangladesh Center for Communication Programs) in the areas, LGED is implementing a good number of infrastructural facilities, namely improvement of hat bazars, roads (both inside and outside of the camps), bridges, culverts, construction of School cum multi-purpose disaster shelters, Satellite Fire Stations, Relief Distribution Center, Community Service Center and many other different types of facilities. Given the project interventions, sensitivity of the areas and volume of people in or around the sites, the project is more likely to trigger certain Operational Policies and Bank Procedures, namely Environmental Assessment (OP/BP 4.01), Natural Habitat (OP/BP 4.04), Forest (OP/BP 4.36) and Physical Cultural Resources (OP /BP 4.11).

[1] ISCG: Situation Report Rohingya Refugee Crisis, (September 27, 2018)

[2] IOM Needs and Population Monitoring round 12 as of October 10, 2018

1.2 Elementary information of Work Package Component of W23.15

It is imperative to recognize proposed components under Work Package-23.15 in Ukhiya Upazila in order to assess and verify its interventions according to stipulated screening requisites from WB. Acknowledging this matter, such details are accounted for as given below in Table 1.2.1 along with visual presentation (General Upazila Map) given in Figure 1.2.1. Aerial map for this component is given in Appendix -5.

Table 0-1.2.1: Basic Featured Information of components [Sources of data: Field survey, 2020: DDC & LGED]

Component's name under W-23	GPS Coordinates	Distance from Upazila HQ	Union	Ward	Project Influence areas locations	Pre-existing condition of Road	Proposed Road type	Road dimension(m) (Length X Width) = Footprint (sq.m) *
Paglir bill saya Khola Road Id:422945082	**Starting Point** $21^0$19'21.0" N $92^0$07'17.4" E **Ending Point** $21^0$19'43.0" N $92^0$07'58.4" E	20	Haldiapalong	2 & 3	Paglirbill, Sayakhola, Borobill & Lengurbill	BFS & Earthen	Bituminous Carpeting (BC)	(2310mX4.9m) = 11,319 sq. m

*Note: Roads are proposed to have average carriage way of 3.7m with 0.6m shoulder on each side; special conditions may prompt further adjustments while in construction period. However, footprint for roads is calculated with an average of 4.9 meters.

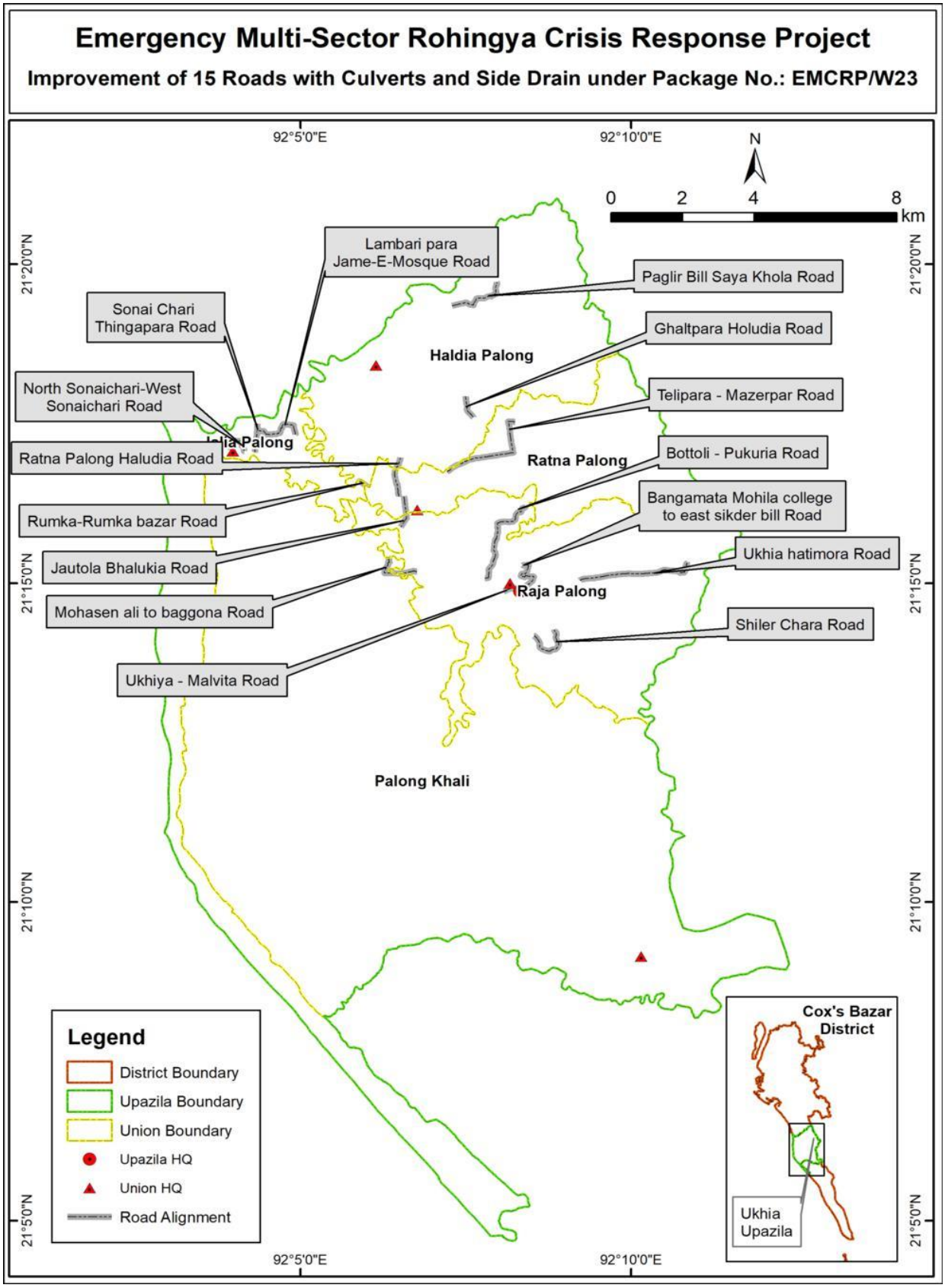


Figure 1.2.1: Map illustrating Paglir bill saya Khola Road Id: 422945082 location in the Ukhiya Upazila

1.3 Proposed intervention items for this component

The Paglir bill saya Khola Road Id: 422945082 (W23/15) under work package W23 have been proposed with specific need basis dimensions to accommodate and ensure best quality interventions for local stakeholders. In context of governing environmental circumstances and geo-meteorological conditions, protection work items have been added to construction design for safety and sustainability of each proposed roads. These roads are abutting agriculture hence, construction and improvement works will descent these roads into new circumstances in some parts. These items have been included on the basis of field survey and analysis of these conditions. Please follow the table to acknowledge these items.

Table 1.3.1: Proposed safety interventions of component

W23-15: Paglir bill saya Khola Road Id:422945082
Construction of 18 nos. Cross Drain (dimension: 0.975mX 0.975m) at Ch. 133.0m, Ch. 209.0m, Ch. 392.0m, Ch. 527.0m, Ch. 685.0m, Ch. 788.0m,Ch. 910.0m, Ch. 950.0m, Ch. 1042.0m, Ch. 1281.0m, Ch. 1535.0m, Ch. 1638.0m, Ch. 1708.0m, Ch. 1805.0m, Ch. 1866.0m, Ch. 1940.0m, Ch. 2034.0m & Ch. 2110.0m of chainage, construction of **02 nos. Box Culvert** (dimension: 2.0mX2.0m) at Ch. 1428.0m & Ch. 2273.0m of chainage and **01 no. Box Culvert** (dimension: 3.0mX2.0m) at Ch. 90.0m of chainage, construction of **Protective work** (152.0m Toe wall, 1.5m & 2.0m height & 21.0m Brick Palisading) at different Chainage, construction of **1438.0m L-drain** at different Chainage, Construction of **Earth** works, **Road safety** works and **Environmental Mitigation and Enhancement** works. Description of safety works and environmental enhancement works can be found in BOQ attached in Appendix-03.

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS

2.1 Methodology

Public participation and community consultation have been taken up as an integral part of environmental assessment process of the project. As part of the impact assessment, participatory public consultation was conducted in areas of concern for proposed roads by the field level staffs and consultants from PIU and D&SC. The consultation meeting was attended by disparate social groups representing local habitants, separate age groups, social class and occupations. In some cases, IUCN employees in charge of elephant watch tower were present where frequent elephant movements occur. The participants were also selected from different segments of stakeholders, and some of whom will have major active roles before, during and even after the construction works. Therefore, the meeting was organized in an informed, expressive and unbiased manner, wherefrom different views and concerns came across which will be properly taken care of during the design and construction phases. In order to serve our screening process, relevant items were thrown towards the audience to discuss and troubleshoot confusing or worrying matters regarding the proposed intervention under package work. Impacts in regards to environment, socio-economic matters during pre-construction, construction and post construction phase have been put forth. Possible

mitigation measures and relevant needs have turned out during these sessions as well. Moreover, their comprehension as a stakeholder has been up lifted in light of project guidelines.

However, public consultation is a living process as the types of problems/ difficulties, involved parties or stakeholders and mode of settlement or resolution processes are more likely to differ with time. Thus, consultation with different parties or stakeholders will be continued throughout the sub-project implementation period and records of resolutions, whatsoever and wherever possible, will be kept in writing at the site and made available on any enquiries or requests by all parties concerned.

Most of the possible impacts under this component development have been put through review for locating impediments or possible adversity effecting future environment and socio-economic conditions. In order to comprehend surrounding features and impacts which may stipulate with it, screening has acknowledged having a Project Influence Area (PIA) of 0.5-kilometer radius. Sensitive findings have been identified if any, and relevant mitigation or minimization measures were suggested to subdue such complication for over the project construciton period. Moreover, evaluation was inspired to enhance environmental features and include monitoring initiatives under ESMP budget to ensure exertion of environmental improvement propositions. Contractor's responsibility has been taken into account while identifying possible impacts through sets of intervention accounts. These steps have been initiated strictly following ESMF guidelines and requirements. Environmental screening procedure was motivated by ingredients highlighted in Appendix-2 of ESMF. During survey, detail chainage length of the sub-projects was taken into account for detailing environmental and socio-cultural features within 100 meters buffer zone of both Left and Right side from the center line of the road. Longitudinal intervals of 300 meters have helped to identify positions of sensitive or near-sensitive socio-cutural features. These findings are illustrated in **Annexure-01**.

2.2 Important features/establishments within the PIA

Initial screening process is conducted through direct involvement of PIU and D&SC in the influence area of the proposed component, which allows to raise significant questions and ideas towards participants. In combination of both field walk-through and inputs of audience, a register of existing features is formed. Allow the following table to describe such elements in all the work package components.

Table 2.2.1: Important features within Project Influence Area for W23.15

Component's name under W-23	Direction	Important features/ establishment (approx. distance from the proposed site)
Paglir bill saya Khola Road Id:422945082	North	Alauddin large jame mosque & madrasah (450m), Brick field (70m)
	South	Monir baper mosque & madrasah (450m), Paglirbill GPS (1km), Lengurbill Darul Mokam central mosque & graveyard (400m), Rustom Ali Chowdhury Dakhil Madrasah (420m)
	East	Boktatoli station (500m), Boktatoli jame mosque (500m), Middle sayakhola mosque (300m), Borobill GPS (500m), Middle sayakhola

Component's name under W-23	Direction	Important features/ establishment (approx. distance from the proposed site)
		graveyard (300m), Sayakhola chorra (8m)
	West	Paglirbill community clinic (100m), Shikderpara station (250m), West Sayakhola Kashem Ulum jame mosque (200m)

2.3 Issues and Recommendations raised by the Participants

After inauguration has set in motion, their valuable opinions and remarks came pouring out. At this point, we find our field base knowledge for assessment attributed impact degrees and possibilities. Please follow the table 2.3.1 given below to recognize participants' inputs arranged in relevance with this component. Consultation meeting summary, attendance sheets and pictures of separate meetings with proposed location for this subproject component can be found in Table 2.3.2 and Annexure-02 and Annexure-03 respectively.

Table 2.3.1: Issues and Recommendations raised by the Participants

COMPONENT'S NAME UNDER W-23.15	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
PAGLIR BILL SAYA KHOLA ROAD ID:422945082	• In Paglirbill, Sayakhola, Borobill and Lengurbill villages area, this proposed road is previously BFS and earthen developed. • Big vehicles cannot use this road due to having short crest. In some occasions, big vehicles move over towards open fields adjacent of this road in order to pass through •Possible dust and noise pollution during the construction works. •Safety of children and adults at the sites during construction works. •Elephant movement is not present. •Local community wish to have a better drainage system along with the road in order to allow waters from higher grounds to find an uninterrupted pathway not causing harm to nearby households or agriculture fields and wash away top soil of adjacent grounds residing alongside the road. It will protect the top soil for future growth of crops and aid vegetable farming or homestead gardens. Abutting the road, the chainage	• Local people considered that the selected site is suitable for the construction of this road from both the technical and social-environmental (Direct savings in the cost of operating vehicles, time savings by travelers and freight, wider effects can less accident rates, this road is waterproof and also dust free, much more durable) point of view. It will provide better mobility and access to services in due time. They feel this improvement with BC is highly needed for them to ensure quality road for better communication facility. •The road should consider water flow during rainy seasons thereby ensuring the construction is not affected by mass water flow. •Enough pathway is expected for vehicle movement so that comfort travel is achieved. •Construction site safety should be ensured to avoid any mishaps or accidents during work periods. •They considered small lumbering and suggested tree plantation initiatives. •They also requested to involve the local community to construction work and they will welcome any outside key labor. •During construction period, alternate route to pass through this area is available. •Since the road is passing alongside homestead gardens and agriculture fields, the intervention will

COMPONENT'S NAME UNDER W-23.15	ISSUES RAISED AND DISCUSSED	RECOMMENDATIONS AND COMMENTS
	consists of homestead gardens. These features should not be disturbed in construction period. •The participants have expressed their greater interest for this intervention and believes this will bring nothing but prosperity for the entire catchment dwellers. •Household fences along the road should be affected while construction, however its will be adjusted during construction period. • Some medium trees should be harmed for preparation of this road • Available pathway to usher material delivering vehicles • Labor shed availability in the target location • Material storage is available • Proposed road passes around 50m width Paglirbill khal, which is seasonally streamed with water, Specially in rainy seasons.	invite air pollution on moderate level during construction period. However, preventive actions and measures can be taken to keep air quality from degrading. • Women should be recruited equally, wherever possible. •Participants, made certain that they will provide surveillance over raw materials and material storage area. •They have also ascertained that the selected site is free from any events related to resettlement and major environmental impacts. The adverse environmental impacts that may come in the way of air quality, noise, solid waste, occupational health & safety during the construction period, and will be of short duration, yet proper management/conservative options should be adopted. • Open spaces are available along the road which can be used for material storage and labor camp. • Electricity is available and contractor can install tube wells as deemed necessary. •Participants expressed their opinion to make a bridge on Paglirbill khal due to easily traffic movement.

Table 2.3.2: Consultation Meetings Summary

Road Package Number	Date DD-MM-YYYY	Venue	Main Participant Groups	No. of Participants	Remarks (If any)
W23-15	07-10-2020	Paglirbill Abdur Rahman's Shop	Host Community	22	-

3. ENVIRONMENTAL SCREENING

3.1 General

This section identifies the potential impacts that the various elements of the proposed Project may have on the physical, biological and socio-economic environment within half a kilometer of the radial distance around the site. Environmental Assessment (EA) based on this screening study for the Sub-project has been conducted to identify and determine which potential Project impacts may be

significant and therefore require the application of reasonable and effective management and/or mitigation measures.

In order to realize the exact physical, biological, socio-economic and environmental impacts of the proposed sub-project sites and the influence area in regards to the implementation measures, an extensive field visit was carried out in each proposed sub-project PIA. Environmental Screening form, as adopted in **Appendix 2** of the Environmental and Social Management Framework of EMCRP, was administered for identifying the impacts and their extents.

The screening data and information for this subproject component and details screening summary have been formulated and shown in **Appendix-01.**

3.2 Major Findings

A complete view of current environmental conditions of individual sub-projects in relation to interested queries has been congregated in order to understand the degree of impacts corresponding with marked interventions. Interestingly, most sub-project has correspondence with its surrounding features and upholds interchangeable impacts. However, the degree is not an interchangeable factor since scale is not parallel to each of these components which is where, mitigation measure differentiation is implied. There are some cases where unique circumstances have been met with while environmental screening took place which is also accounted for and should be a matter of concern for other parts of the ESMF initiative. The significant issues observed for this subproject component is enlisted in following Table 3.2.1 with pertaining impacts. Moreover, impacts that are adventitious has also been embraced for promoting best practices.

Table 3.2.1: Concerning environmental issues relating to each proposed subproject and influence area for W23.15

COMPONENT'S NAME UNDER W-23.15	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
PAGLIR BILL SAYA KHOLA	It is not located within any major environmentally sensitive area.	It will not cause any severe negative effects to the environmental settings of the area neither to important environmental features.
	Construction period will induce air pollution while preparing for bitumen and loading-unloading raw materials. Impacts on air quality during the construction phase may turn to negative. The main impacts include dust generation from crushers, vehicles and the transportation of all types of construction materials.	It will invite waste production which may in turn cause minor air pollution due to deposited dust and airborne particles less than PM_{10}. Dust pollution may slightly suffocate photosynthesis however this can be minimized through regular water sprinkling as suggested in ESMP.
	Noise emission from construction machineries and equipment can cause nuisance to local residents and workers.	The ambient noise level might have potential to increase temporarily and intermittently in the close vicinity of active construction fronts.
	No drainage system, fish farming and significant vegetation coverage is located in the ROW nor does it stand over such items. Nonetheless brick field, high land (tila), electric pole agriculture	No agriculture land or any forest coverage will get degraded or lost for construction. Liquid waste such as left-over oils or chemicals might run into these adjacent features.

COMPONENT'S NAME UNDER W-23.15	FINDINGS IN REGARDS TO ENVIRONMENTAL CONCERNS	RELEVANT IMPACTS
ROAD ID:422945082	fields and homestead gardens/forest are found beside the road.	
	Construction works will involve chemical usage and preparation of on-site add-ons to the road. Generating scraps and residues.	The runoff from work site may enter existing pond and frustrate the water quality which will be acute however.
	Fair amounts of bush (sapling) clearings may need cutting at different chainage.	No severe damage will occur or damage to habitat will be faced. It can be managed by introducing small plantation incentives around the proposed location.
	Elephant Movement is not present in the vicinity of the subproject location.	No impact is expected here
	No heavy earth excavation work will be involved.	Consequently air, noise and dust pollution will be occurred within a small-scale during construction period only.
	Construction related activities and setting up of labor camps along with associated facilities and their management can cause adverse impacts.	Noise pollution from pilling or drilling, air pollution caused by dust or gaseous emissions from vehicle movement, running of motorized equipment and land clearing, odors and soil pollution from leaking of latrines and fecal sludge, will more likely to take place.
	Chemical spills or improper disposal of construction waste materials due to lack of worker training and misconduct of contractor's safety initiatives.	During the construction period, soil may get contaminated from activities such as handling of hazardous construction materials (such as fuel, lubricants, paints, and solid waste and sewage).
	Vibration effects generated from mixing, grinding, pilling, drilling or other construction works	Any vibration would result in nuisance effects to nearby faunal species, and but will be localized and temporary and will unlikely to result in structural damages to buildings or walls of the adjacent private properties.
	Sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site are at north side Alauddin boro jame mosque & madrasah (450m) and a brick field at south side. Monir baper mosque & madrasah (450m), Paglirbill GPS (1km), Lengurbill Darul Mokam central mosque & graveyard (400m), Rustom Ali Chowdhury Dakhil Madrasah (420m), at east side Boktatoli station (500m), Boktatoli jame mosque (500m), Middle sayakhola mosque (300m), Borobill GPS (500m), Middle sayakhola graveyard (300m), Sayakhola chorra (8m) and west side Paglirbill community clinic (100m), Shikderpara station (250m), West Sayakhola Kashem Ulum jame mosque (200m).	No disturbance to all these establishments/features is anticipated due to construction activities for the sufficient distance from the construction site, and strict construction site management system-including restrictive work schedule during the daytime only, water-sprinkling twice a day on and around the site, safe storage of materials, etc.

A few incidents of human elephant conflict have been reported in 2018. The IUCN has conducted a study on such conflict. With the support from UNHCR, IUCN has been marking elephant routs and corridors and informing local communities and stakeholders of avoiding the marked areas. As part of the mitigation options, different initiatives have been undertaken, such as formation and capacity development of Elephant Response Teams (ERTs); providing equipment to ERTs to divert in-coming elephants; and setting up elephant deterrent tools (e.g. trip alarms and watch-towers). Though the current chances of occurrence of conflicting incidence are zero, any recurrence would be managed by the ERTs and they will be called if there appears any minute possibility to recur. A map of elephant movement is given in Annexure 04.

In order to offset the loss or attenuating the environmental degradation, a set of mitigation measures will be adopted, on top of general practice of standard construction procedure or following the relevant codes of practices.

3.3 Climate Change Impact Screening

3.3.1 General Overview of the area

Cox's Bazar is one of the coastal districts of Bangladesh and is prone to the effects of climate change due to its geomorphological siting and climate induced effects. The hilly tracts of Cox's Bazar could foster further environmental crisis brought on by indiscriminate deforestation and diminishing groundwater reservoirs, which have been taken place in recent months as the Rohingya crisis evolved. A recent study conducted by World Bank[3] has found that Cox's Bazar will be the worst-hit district in South Asia as average temperatures rise and rainfall patterns become disruptive, by 2050, if greenhouse gas emissions continue unabated.

The hilly region of the country, especially the part in Cox's Bazar is characteristically of muddy soil structure, not of any rocky formation and the stability comes from the roots of the trees. Also rainfall, proximity to the sea, elevation, and land cover are very important factors for analyzing the risk of cyclone. Denudation of trees from hilltops in order for the huge settlement of Rohingya people has already increased the vulnerability to the risk of hill collapse by destabilizing the terrain. Also deforestation at a rapid speed uncovers the land and raise the risk of occurrence of cyclones, as forests protect land from high wind and storm surges where demolishing the trees would make the area vulnerable.

Together with the above-mentioned hazardous situation, again due to sudden extraction of huge amount of groundwater, availability of potable water from shallow tube wells that pump water up from about 150 feet has already reached to a critical level. Averting the problem requires new tube wells to be plumbing deeper into the poorly mapped aquifer, but going deeper than 700 feet in some places may cause salt water to contaminate freshwater resources.

In this case, it is possible that a stationary position of the freshwater-saltwater transition zone can be established via proper management of pumping in the confined aquifer.

[3] https://openknowledge.worldbank.org/bitstream/handle/10986/28723/9781464811555.pdf

The groundwater resource is seen to suffer more from the climate change impact. The impact on groundwater due to climate change impact include

- Sea-level rise could result in a transgression of the sea and a loss of land area. This could also lead to the secondary effect of population migration in the new coastal band due to migration of the coastal population from the encroaching sea, thereby increasing domestic water needs in the new coastal area.

- Transgression of the coast implies that saline storm surges of 1 or more meters depth would penetrate beyond the new coast to new land areas. Storm surges transport saline water far inland of the coast and much of this floodwater may infiltrate the ground in areas where the aquifer is not fully saturated. Even where the aquifer is saturated, denser saline water may sink into the aquifer during the flood and later from pools of saltwater that remain following the flood[4].

- It has been identified that the salinity is found in the shallow aquifers along the coastline. So the salinity which are found in the groundwater are of lesser concern as salinity will subside over time

- Several researches show that through modeling of groundwater flow that the depletion of groundwater in the host community will persist up until 2022 and the replenishment of water will take place.

Considering the general climate change effects in Cox's Bazar area and offsetting the aggravating environmental situation due to the mass arrival of Rohingya communities, several specific measures including tree planation in sub-project areas, rainwater harvesting from every disaster shelter, construction of drainage facilities along the road length and installing thunder arrester across the areas, have been suggested and will be implemented.

3.3.2 Site Specific Screening and outcome

Climate Change impact on a particular subproject is tough to deduce as the highest resolution of climate model simulation done over Bangladesh is 50km. Depending on the simulation ensemble of Cox's Bazar district, the temperature and precipitation are likely to increase with time.

Site specific climate change impacts are often not so easy to measure or deduce plausibly while the site is confined to a narrow strip of roadways, and associated mitigation or offsetting measures are really hard to plot on the impact areas, though an overall set of measures are often considered in practical aspect. Fig: 1 shows the inundation risk map of the subprojects under W-23, none of the subprojects are in vicinity of the severe river flood inundation area. So the risk of flooding is low around the sub-project area

[4] "Implications of Climate Change for Fresh Groundwater Resources in Coastal Aquifers in Bangladesh", World Bank report.2010

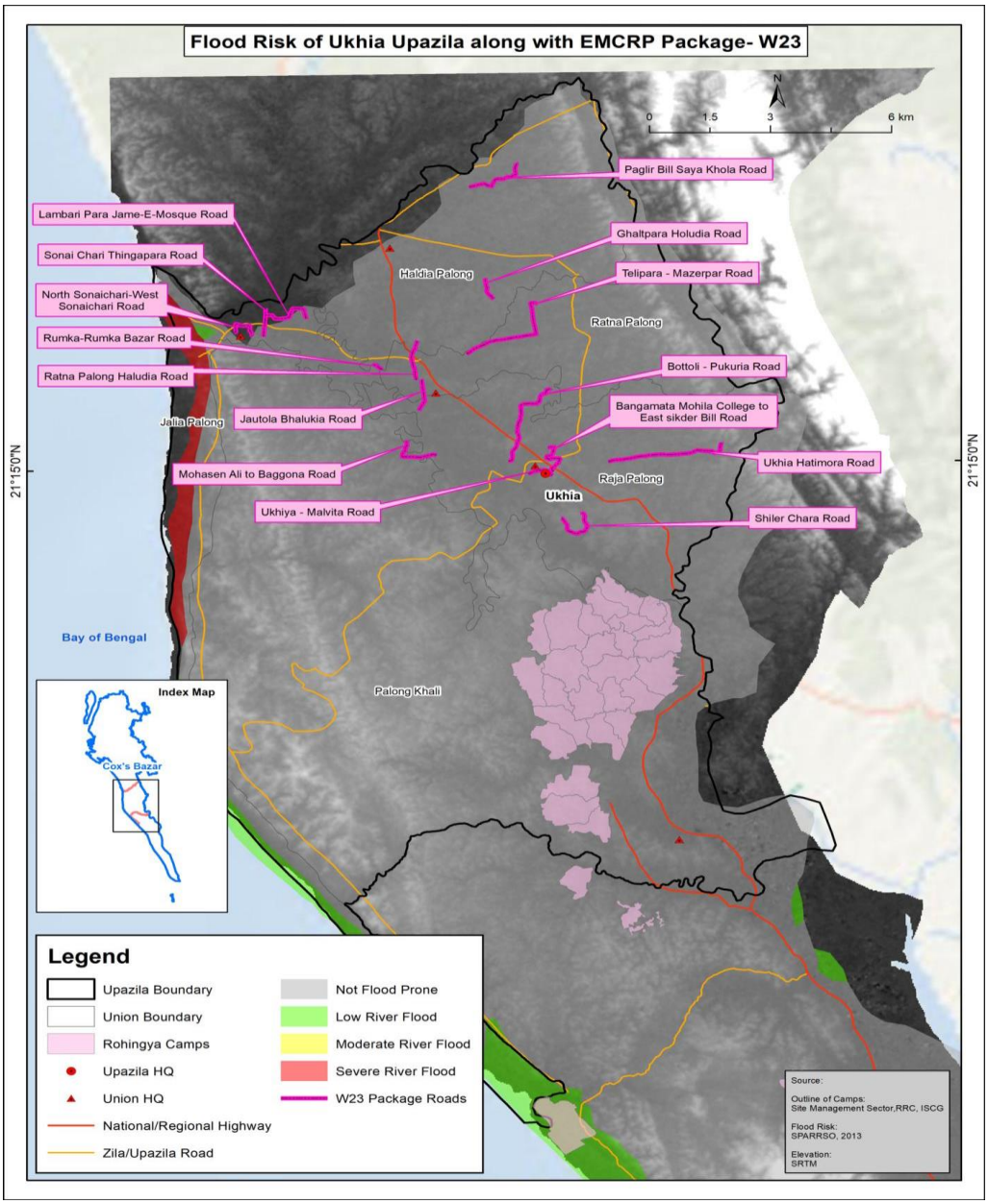


Figure 3.3.2.1: Flood inundation risk map near the subprojects.

Also, in order to avoid the devastation caused by the thunderstorm, state-of the-art thunder arrester (lightning protection system) has been suggested to install having a coverage area of 25,434 sq.m for a single arrester. In addition, tree planation on the road slope/ within the premises is also suggested to sooth the temperature effect and increase the water retaining capacity of soil, at the same time.

4. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

4.1 General

Considering the environmental settings of the sub-project area, it can be assumed that possible impacts would be largely construction-related, and could be addressed through adoption of good engineering practices; good housekeeping; better *in-situ* construction materials management; and observance of health and safety protocols during the implementation period.

Table 4.1.1: Site Specific Impact and Mitigation Plan under package W23.15

Component's name under W-23.15	Impacts	Mitigation plan
Paglir bill saya Khola Road Id:422945082	Brick field (70m) at north and Sayakhola chorra (8m) to the east. Further, some settlements located adjacent to the sub-project area might get affected during the construction period with the generated debris and dust, though for the time being.	Contractor must adhere to the best practice debris management procedure and regular adoption of dust control measures (spraying of water at least twice a day) to minimize the effect to the level best.
	Proposed subproject area arises water logging problem during the monsoon sometimes. On the other hand, some part of the proposed road is passing by the agricultural land. Box culvert and cross drain will be constructed to terminate rainwater for one side to another side during rainy season and also help for rapidly remove excess soil water to reduce or eliminate waterlogging during monsoon and return soils to their natural field capacity and will help to maintain the water balance of both roadside agricultural land to provide a sustainable irrigated agricultural system. It will also help to prevent flood and not to allow water to overflow and also help to divert water for farming. Some high land is found beside the road. So L-Drain will be constructed for drainage high land eel water during rainy season. Some low land is found beside the proposed road so protection wall and palisading work will be constructed during construction period for used to "correct" the natural slope. There are points on the road where slope preparation cannot be done due to having low lying agriculture lands and water bodies. Slope preparation refers to resettlement issues as well in those locations. In such cases Toe Wall is proposed which helps to restrain the horizontal surface pressure. This is an adaptation technique and a precaution measure to not allow any damage to sideline existing low-lying features. There are low lands along the road where agriculture fields and ponds are present. This also excludes high chance of soil quality degradation.	Proposed safety structures are **18 nos. Cross Drain** (dimension: 0.975mX 0.975m) at different chainage and **02 nos. Box Culvert** (dimension: 2.0mX2.0m) at Ch. 1428.0m & Ch. 2273.0m of chainage and **01 no. Box Culvert**(dimension: 3.0mX2.0m) at Ch. 90.0m of chainage, **Protective work** (152.0m Toe wall, 1.5m & 2.0m height & 21.0m Brick Palisading) at different Chainage, **1438.0m L-drain** at different Chainage, **Earth** works, **Road safety** works and **Environmental Mitigation and Enhancement** works.

Further construction related activities which may result in adverse impacts in the surrounding environment of the sub project component must be kept under close consideration and appropriate mitigation and management measures will be taken with due care and vigilance. Once the effects are minimized to its least level and controlled efficiently, it will turn into a welcoming and beneficial project for the local communities. The component specific environmental management plans have been outlined in **Appendix-2**. The mitigation measures as well as monitoring program of ESMP have also been incorporated in the management plan.

Environmental quality enhancement: Under the additional financing to the EMCRP project, Forest Department of the Government of Bangladesh will afforest along 200 km of road length area, primarily under the Ukhiya and Teknaf Upazila of Cox's Bazar district in order to offset the environmental and ecological devastation, that had been occurred due to the evolution of Rohingya Crisis, to an achievable level. Many of these road lengths will go through and by the Rohingya Camps, up on the hill and are already denuded of trees or vegetation. Local Government Engineering Department (LGED) will allocate and channelize the finance to the Forest Department under the said additional financing component and oversee the progress of works with due diligence. However, this enhancement work will improve the environmental quality of the area and reinstate some parts of the ecosystem services to those areas, though primarily.

4.2 Health and Safety Measure under COVID Situation

Apart from the established Occupational Health and Safety (OHS) measures being followed in construction sites, offices, and labor camps, a set of additional measures has to be taken and practiced throughout the daily cycle by each labor, staff and any involved parties, due to the ongoing pandemic coronavirus situation. Staffs and consultants at PIU and D&S, along with the pool of consultants under different firms/agencies for different services, and all the representatives or staffs of construction contractors and suppliers have to play much sensitive, (pro-) active and responsible roles in abiding by the rules and measures by themselves and getting the involved workers and different stakeholders adhered to the same. A detailed guideline containing a set of measures with shared responsibilities has been sketched out in order to fight the exposure and further spread of this potentially fatal situation. This plan or guideline shall constitute an integral part of ESMP measures for every sub-project, though is not included in this report to keep it concise and specific, and the contractor is required to keep the copy of that guideline at every site office.

However, among many other relevant issues, the guidelines emphasize on following line of directives:

a. Contractor must designate one of his employees as H&S/Safeguards supervisor to lead, coordinate and interface in order to fight the COVID 19 situation under the direct guidance of COVID focal at PIU of EMCRP project.
b. All workers, supervising and supporting engineers and staffs, consultants, service providers and other concerned parties must adhere to the personal health and hygiene rules, social distancing, and other protective measures in full in order to protect themselves and contain the infections any further. Necessary training and awareness campaign will be aligned with the specific sub-project scenario and prevailing conditions.

c. General practice of cleaning and hygiene has to be maintained in all project/site offices and camp sites, and supply of necessary PPEs and cleaning /disinfecting materials along with proper use of those is to be ensured.
d. Public consultation and stakeholder engagement are to be carried out considering the prevailing risks of virus transmission in the target areas, scope of interventions and level of ICT penetrations among the target stakeholders, and so on.
e. Necessary protocols have to be established and maintained in case of handling a sick employee or worker, and appropriate compensation to a sick disengaged labor is required to be given with due documentation.
f. Budgeting for suggested protective measures, along with necessary supervision and monitoring for the required interventions has to be ensured.

Following the additional health and safety measures presented in that guideline, sub-project component specific BOQ items have been inserted to supplement the budget considering the country-specific situation, capacities, and scope of interventions. The additional cost to Health and Safety Measures under COVID 19 situation is shown in **Appendix-3.**

4.3 Cost of Environmental Enhancement Works in BOQ

In consideration to the above-mentioned environmental impacts and their mitigation measures for this sub-project component, a set of items are included in the BOQ of this sub-project component. Social Safeguard Personnel for Environmental and Social Management for Work Package EMCRP/W23 has also been added in the whole BOQ in order to take supervision and leadership to organize Environmental Management under Environmental Enhancement Works. The total costing and estimation have included enhancements such as Grass turfing plans, Tree plantation initiatives, and Dust Suppression mechanisms. On the other hand, in order to ensure health safety and sanitary measures of workers PPE, First Aid Box, Labor shed, Environmental management, drinking water facility with water tests, Temporary latrine for both male and female as well as waste disposal systems has been accounted for. Ensuring sustainable labor performance in regards to environmental and social considerations motivational training has been taken into account. An overview of the estimation is given below and the detailed estimated cost to implement the ESMP is shown in **Appendix-3**.

5. LIMITATION OF THIS STUDY

Bangladesh government has imposed a nationwide lockdown to curb the spread of the novel coronavirus in the wake of series of deaths and infections. Authorities declared a ban on passenger travel on all sector from March 24 while all public transport on roads have been suspended from March 26 to stem the spread of virus, officially known as COVID-19. All office works have been postponed and an intended visit to the sites for further consultation with the relevant stakeholders has had to cancel due to this crisis. Therefore, some relevant information and arrangement needs waiting for recovering this pandemic crisis.

6. CONCLUSION AND RECOMMENDATIONS

The overall conclusion is that if the mitigation, compensation and enhancement measures are implemented in full, there will be no significant negative environmental impacts in regards to the selection of location, design, construction, and/or operation procedure of the proposed component. There will in fact be tremendous benefits from recommended mitigation and enhancement

measures and major improvements in quality of life, opportunities in business, trading jobs and ensuring social safety and security will be achieved once the scheme is in operation.

The conclusions of the Screening study can be summarized as follows:

- The communities will receive large benefits through improved infrastructural facilities, transportation & communication etc.
- The short-term negative impacts that may come by the way of air quality, noise, solid waste, occupational health & safety need to be minimized through the management plan.
- The project will create employment for those who live in the vicinity of the construction site and will provide them a short-term economic gain.
- The green belt development, if necessary, for the road site, with large-growing trees at the periphery of the site will give the places a more natural and pleasing appearance.
- A comprehensive Environmental and Social Management Plan (ESMP) has been prepared to mitigate and reduce the adverse impacts that will come out from the Subproject activities.

Implementation of this component will have large positive impacts to the communities in terms of improved infrastructural transportation & communication facilities, which would eventually develop the socio-economic condition of the catchment areas. So, strong recommendation should be put in place to implement the sub-project within shortest possible period of time, and with great care and efficiency.

Annexure-01: Important Environmental Features (IEFs) near site

Detail Environmental features within 100m of the both sides from the center line were collected @300m longitudinal intervals. The findings of the survey for the aforementioned road can be seen in the table below:

Table: Detailed Chainage length and features of the Sub-Project component

Road Name	Paglir bill Saya Khola Road Id:422945082 **(W23-15)**	**Total Chainage**	2310.0m

Chainage (m)	**Left**	**Right**	**Features**
000-300	L		Ground of brick field, culvert, tin shed household, paddy land, open space, Sayakhola station, steel shape bridge on Paglirbill khal
		R	Electric pole, brick field, high land, open land, vegetables garden
300-600	L		Bamboo bushes on high land, shop, open land, paddy land, vegetables garden, household connecting road, net fencing, tin shed earthen households, bamboo fencing, electric pole, bamboo bushes, bamboo fencing, betel nut garden, electric pole, paddy land
		R	Bamboo bushes on high land, electric pole, open space, bamboo bushes, tin shed earthen household, high land (tila), bamboo bushes, bamboo fencing, household connecting road, bamboo bushes, trees
600-900	L		Mango trees garden, local trees, bamboo bushes, household connecting roads, bamboo bushes, paddy land
		R	Bamboo bushes on high lands, paddy land, electric pole, open space, electric pole, tin shed earthen household, bamboo fencing
900-1200	L		Paddy land, pond, bamboo bushes, household connecting road, tin shed earthen household, betel leaf yard, trees, settlements, betel leaf yard
		R	Tubewell, settlement on high land, mosque, betel leaf yard, shop, electric pole, household connecting road, bamboo fencing, betel leaf yard
1200-1500	L		Betel leaf yard, bamboo fencing, electric pole, open space, mosque, high land (tila), settlements, paddy land, household connecting road, bushes on high land
		R	Bamboo bushes on high land, bushes, shop, betel leaf yard, tila, betel nut garden, open space, household connecting road, ditch, local drain, electric
1500-1800	L		Betel leaf yard, bamboo bushes on high land, bamboo fencing, tin shed earthen household, bamboo fencing, sugarcane garden, bamboo bushes on high land, connecting road, shop
		R	Open space, betel leaf yard, bamboo made household, mango trees, vegetables garden, trees, shop, bamboo fencing, betel leaf yard
1800-2100	L		Bamboo fencing, earthen household, bamboo bushes, electric pole, tin shed household, paddy land, trees, bamboo bushes, high land, settlement, bamboo bushes on high land
		R	Bamboo fencing, tin shed household, bamboo bushes, household connecting road, paddy land, bamboo bushes, bamboo made household, high land, open land, paddy land

2100-2310	L		Tin shed household, betel leaf yard, bamboo fencing, bamboo bushes on high land, betel leaf yard, paddy land, bamboo bushes on high land
		R	Paddy land, bamboo fencing, bamboo bushes on high land, bamboo made household, ditch, electric poles, paddy land, household on high land

Annexure-02: Attendance of consultation meetings for W23/15

EMCRP/W23.15

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)

অগ্রাধীন ভিত্তিতে রোহিঙ্গা সংকট মোকাবেলায় বহুমুখী সেক্টর প্রকল্প

Local Government Engineering Department (LGED)

Public Consultation Participants List

Focus Group Discussion

সময় : 11:45 AM তারিখ : 07.10.2020

উপ-প্রকল্প/কমপোনেন্ট এর নাম : পাগলির বিল ঘূর্ণিঝোলা সড়ক

সভা বিষয়ক স্থান : পাগলির বিল আবদুর রহমানের চা'র দোকান

ইউনিয়ন : হলদিয়াপালং ওয়ার্ড নং : ২ মৌজা : মরিচ্যাপালং উপজেলা : উখিয়া জেলা : কক্সবাজার

সব পাতার সংখ্যা : ২৩(তেইশ)

অংশগ্রহণকারীদের তালিকা (পরিচয় ও স্বাক্ষর)

ক্রম নং	নাম	বয়স	পুরুষ/মহিলা	গ্রাম	স্বাক্ষর / টিপসই
০১	Ali Ahmed (আলী আহমেদ)	৬৪	পুরুষ	পাগলির বিল	
০২	মো: হাছেন আলম	২২	পুরুষ	৭	
০৩	আহমদ হোছেন	২২	"	"	
০৪	হবির আহমদ	২৭	"	"	
০৫	কেফায়েত উল্লাহ	২৭	"	"	
০৬	মোহাম্মদ আলম	২৭	"	"	
০৭	ফয়জাল উল্লাহ	২৪	"	"	
০৮	আবদুল হাকিম	৭০	"	"	
০৯	মিজানুর আহমেদ	৩৫	"	"	
১০	নবি আহমদ	৫০	"	"	
১১	বাবুর রহমান	৫২	"	"	
১২	হাসনা বিবি	৪৫	"	"	
১৩	মোঃ বাকের	২২	"	"	
১৪	রমিজ বিবি	২০	"	"	
১৫	নুরুল আমিন	২৭	"	"	
১৬	ছেরু আলী	৩৫	"	"	
১৭	আতিকুল হক	২৫	"	"	

EMCRP/W23.15

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)

স্থানীয় ভিত্তিতে রোহিঙ্গা সংকট মোকাবেলায় বহুমুখী সেক্টর প্রকল্প

Local Government Engineering Department (LGED)

Public Consultation Participants List

Focus Group Discussion

সময়: 11:45 AM তারিখ: 07.10.2020

উপ-প্রকল্প/কমপোনেন্ট এর নাম: পাগলিনালা ড্রেন নির্মাণ

যে বিষয়ে হবে: পাগলিনালা ড্রেন নির্মাণ

ইউনিয়ন: ইলদিয়াপালং ওয়ার্ড নং: ২ মৌজা: ইলদিয়াপালং উপজেলা: উখিয়া জেলা: কক্সবাজার

মোট পৃষ্ঠা সংখ্যা: ২৩ (১৪)

অংশগ্রহণকারীদের হাজিরা (পরিচয় ও স্বাক্ষর)

ক্রম নং	নাম	বয়স	পুরুষ/নারী	গ্রাম	স্বাক্ষর / টিপসই
১৮	করিম উল্লাহ	৫০	পুং	পাগলিনালা	করিম উল্লাহ
১৯	মো: ইউনুস	২৫	"	"	
২০	নুরুল কবির	৪২	"	"	
২১	[illegible]	৬২	"	"	[illegible]
২২	নুরুল আলম	৪০	"	"	

Figure: Attendance of consultation meeting for W23-15

Annexure-03: Pictures of sub-project component location and surrounding features with public consultation



Starting point of Paglir bill saya Khola Road



Steel Shape Bridge over paglirbill khal which is on the pathway of road



High land and local trees on the sides of the road



Paddy land, Electric pole & bushes on the sides of the road



Earthen condition and bamboo bushes on the way to road



Consultation meeting with local community

Figures: Present condition of Paglir bill saya Khola Road (W23-15) & Public Consultation meeting with Host community

Appendix-1: Environmental Screening Form for examining sub-project component
Environmental Screening Form for Sub-project W23-15

Sub-Project Description Form:

Name of Sub-Project: (Improvement of 15 Roads with culverts and side drain under Cox's Bazar District. EMCRP/W23).

Name of the component: Paglir bill saya Khola Road Id: 422945082

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Estimated total cost of sub-project (in Taka): 417,036,298.10 Tk.

Estimated construction period duration: 1 year

Estimated total cost of the component (in Taka): **41,797,563.75 Tk.**

Estimated Operation and Maintenance period (life of sub-project): Project design life more than 15 (Fifteen) years but Government policies on how long projects can operate in the camps.

District: Cox's Bazar **Sub-District**: Ukhiya **Union**: Haldiapalong

Name of Community/Local Area: Paglirbill, Sayakhola, Borobill & Lengurbill

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):

The Sub-Project is categorized as a village road and improvement with Bituminous Carpeting (BC) options. For drainage of rain water Construction of **18 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 133.0m, Ch. 209.0m, Ch. 392.0m, Ch. 527.0m, Ch. 685.0m, Ch. 788.0m,Ch. 910.0m, Ch. 950.0m, Ch. 1042.0m, Ch. 1281.0m, Ch. 1535.0m, Ch. 1638.0m, Ch. 1708.0m, Ch. 1805.0m, Ch. 1866.0m, Ch. 1940.0m, Ch. 2034.0m & Ch. 2110.0m of chainage, construction of **02 nos. Box Culvert** (dimension: 2.0mX2.0m) at Ch. 1428.0m & Ch. 2273.0m of chainage and **01 no. Box Culvert** (dimension: 3.0mX2.0m) at Ch. 90.0m of chainage and due to the low land in different chainage for **Protective work** (152.0m Toe wall, 1.5m & 2.0m height & 21.0m Brick Palisading) at different Chainage, for existing high land besides the road construction of **1438.0m L-drain** at different Chainage as well as **Earth** works, **Road safety** works and **Environmental Mitigation and Enhancement** works has been included in the estimation.

Estimated footprint / land area for this sub-project is 11,319 sqm.

Brief description of sub-project site: (e.g. present land use, Important Environmental Features (IEFs) near site, etc.:

This proposed Paglir bill saya Khola Road belongs to Paglirbill, Sayakhola, Borobill & Lengurbill villages at Haldiapalong union, Ward-2 & 3 under Ukhiya Upazila. This road has started from Masjid-Paglirbill road stretching 2310 meters from West side to North side, along with brick field, settlements, crosses Paglirbill khal, bamboo bushes, boundary wall, shops, trees, electric pole, mosques, ditches, homestead gardens etc.

Overall Comments

The proposed component of the sub-project (Road improvement) is not located within any remarkable environmentally sensitive area and will not cause any severe affect to the environmental settings of the area, thus not going to create intimidation to important environmental features. No drainage congestion/water loggings have been observed in the road area. No agricultural productive soil will be used for the purpose. Earth will be compacted for stabilization. The inputs will be mainly at construction phase and limited within project boundary. Moreover, mitigation measures will be taken according to the ESMP for minimizing the air, dust and noise pollution.

It has been revealed that this project's scopes of works do not intend to overtake their area of lodgment and funding entity has no intention to do so. Moreover, other issue has also been brought to their attention that drainage system and a bridge have also been included into the evaluation of this project since runoff from higher grounds are also a concerning matter during rainy season.

People of the subproject area are very much optimistic about the success of the project and are also eager to participate in the project activities. The subproject is environmentally sustainable and socially acceptable. The local community attended in the participatory public consultation meeting. Their community representatives as teachers, shop owners, farmers and elders have no objection to the construction this infrastructure in the proposed site; the community also appreciated the initiative of LGED to ensure safe access and better portability. The public consultation meeting results confirmed that improvement of this road will increase socio-economic interest in the communities and make lives easier for these people. They also requested to construct the road in accessible width so that small auto and motor vehicles can pass easily. Water flow from undulated terrains is a factor that should be considered for construction because 1 week worth of rain invites water flow which makes this surrounding area logged in several places. On another matter, locals requested to involve the local community to construction works and material storage monitoring duties.
The road is not located within any identified environmentally sensitive area, and therefore, does not seem to cause any adverse impact on the important environmental features. No significant impact is expected on the ecosystem and biodiversity, no agricultural land/ activities or fish farming will be disturbed, due to the construction of the sub projects. Only forest is found as homestead forest on high grounds of the location.

Types of waste to be generated during construction and operation phase:

During construction period solid waste will be generated due to construction activities. The types of wastes are brick pit, unused sand, wood, gravels, bitumen etc. The types of wastes are gravel, stones, rock, wood, copper wires, concrete, iron, plastic etc. Negligible amount of plastic will come as residue. Moreover, liquid waste will include chemicals of bitumen leftovers, motor oils, used oil, degreasing solvents etc. Human wastes and kitchen wastes will be generated from labor camps as well.

Sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site including elephant migration routes and remaining forests:

Within the influence area of the subproject no historical sites were identified. This sub-project is situated within Paglirbill, Sayakhola, Borobill & Lengurbill villages at Haldiapalong union, Ward-2 & 3 of Ukhiya Upazila, Cox's Bazar. Some sensitive environmental, cultural, archaeological, religious sites near (within 1km) of site are at north side Alauddin boro jame mosque & madrasah (450m) and a brick field (70m) at south side Monir baper mosque & madrasah (450m), Paglirbill GPS (1km), Lengurbill Darul Mokam central mosque & graveyard (400m), Rustom Ali Chowdhury Dakhil Madrasah (420m), at east side Boktatoli station (500m), Boktatoli jame mosque (500m), Middle sayakhola mosque (300m), Borobill GPS (500m), Middle sayakhola graveyard (300m), Sayakhola chorra (8m) and west side Paglirbill community clinic (100m), Shikderpara station (250m), West Sayakhola Kashem Ulum jame mosque (200m). Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists.

Some human settlements and homestead garden are found around the sub-project area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). Elephant migration routes were about 24-25 km away from this sub-project. No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below:

Section A: Sub-Project Overview

Description of sub-project/component interventions:
The Sub-Project is categorized as a village road. Based on field survey, this sub-project involves of Herring Bone Bond (HBB). According to the design this sub-project will be developed with Bituminous Carpeting (BC) from Ch. 00 to Ch. 372m.

Subproject interventions:

- **Bituminous Carpeting (BC)** options.
- **18 nos. Cross Drain** (dimension: 0.975mX 0.975m) at Ch. 133.0m, Ch. 209.0m, Ch. 392.0m, Ch. 527.0m, Ch. 685.0m, Ch. 788.0m,Ch. 910.0m, Ch. 950.0m, Ch. 1042.0m, Ch. 1281.0m, Ch. 1535.0m, Ch. 1638.0m, Ch. 1708.0m, Ch. 1805.0m, Ch. 1866.0m, Ch. 1940.0m, Ch. 2034.0m & Ch. 2110.0m of chainage
- **02 nos. Box Culvert** (dimension: 2.0mX2.0m) at Ch. 1428.0m & Ch. 2273.0m of chainage and **01 no. Box Culvert** (dimension: 3.0mX2.0m) at Ch. 90.0m of chainage
- **Protective work** (152.0m Toe wall, 1.5m & 2.0m height & 21.0m Brick Palisading) at different Chainage
- **1438.0m L-drain** at different Chainage
- **Earth** works
- **Road safety** works and
- **Environmental Mitigation and Enhancement** works (description of such items can be found in BOQ)

Sub-project Location:

Important Features	
ID	422945082
District	Cox's Bazar
Upazila	Ukhiya
Union	Haldiapalong
WARD	2 & 3
Total Chainage	2310 m
Proposed Chainage	2310 m
Road Type	Village Road
Proposed Intervention Type	Bituminous Carpeting (BC)
Road Starting Point Coordinates	Latitude: $21^0$19'21.0" N Longitude: $92^0$07'17.4" E
Road Ending Point Coordinates	Latitude: $21^0$19'43.0" N Longitude: $92^0$07'58.4" E

Land ownership

Land is owned by Government.

Expected construction period: 1 year

Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water bodies, etc. and historical or socio cultural assets): Please also explain any analysis on alternative location was conducted:

Some existing interventions within the sub-project location at north side Alauddin boro jame mosque & madrasah (450m) and a brick field (70m) at south side Monir baper mosque & madrasah (450m), Paglirbill GPS (1km), Lengurbill Darul Mokam central mosque & graveyard (400m), Rustom Ali Chowdhury Dakhil Madrasah (420m), at east side Boktatoli station (500m), Boktatoli jame mosque (500m), Middle sayakhola mosque (300m), Borobill GPS (500m), Middle sayakhola graveyard (300m), Sayakhola chorra (8m) and west side Paglirbill community clinic (100m), Shikderpara station (250m), West Sayakhola Kashem Ulum jame mosque (200m). Within the influence area of the subproject no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (checked with local IUCN representative).

Section B: Environmental Screening

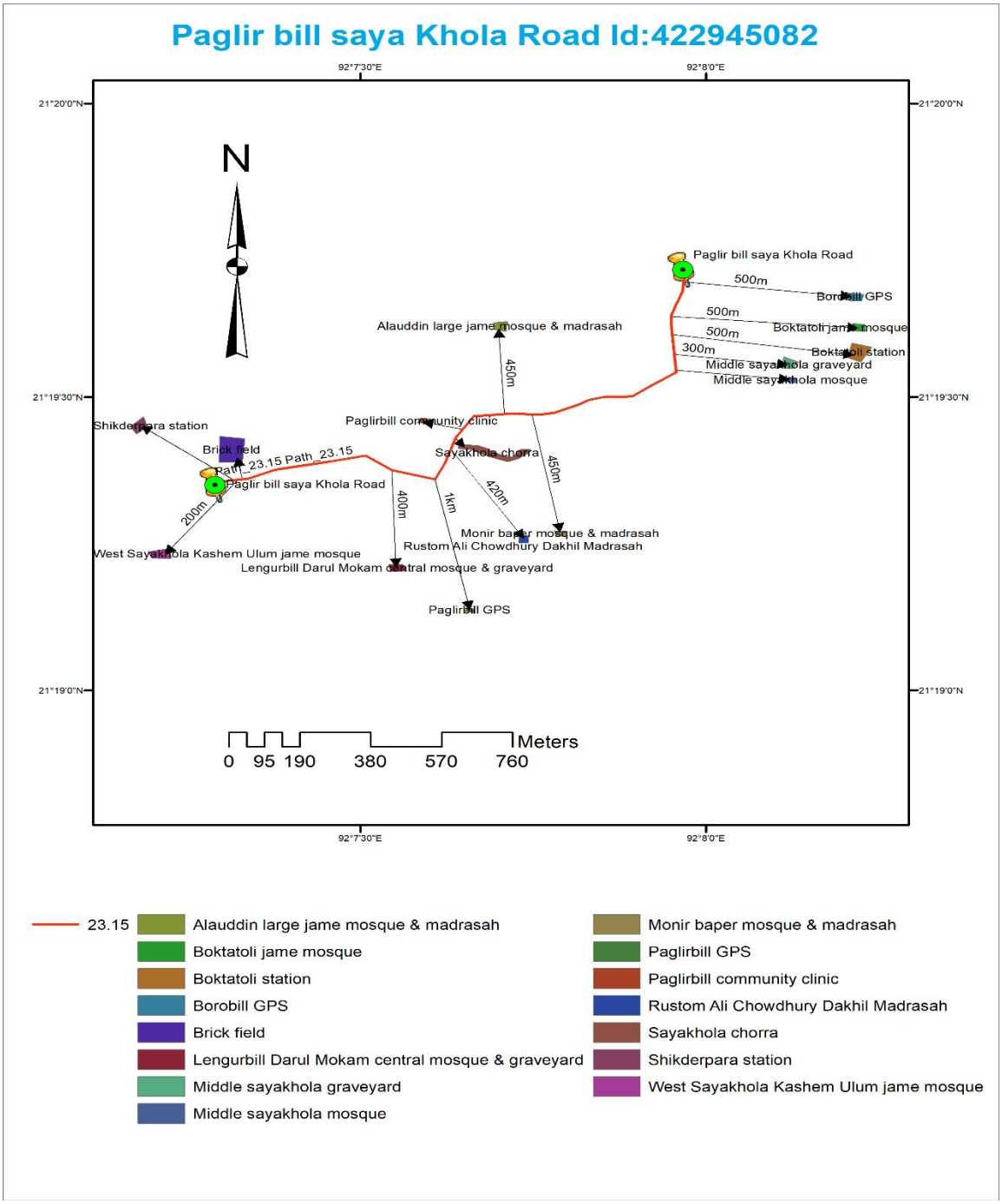
***B.1*: Environmental feature of sub-project location**

Description of cultural properties (if applicable, including distance from site): Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests:

Sensitive environmental, cultural, archaeological, religious sites within 1 kilometer of site including at Alauddin boro jame mosque & madrasah (450m) and a brick field (70m) at south side Monir baper mosque & madrasah (450m), Paglirbill GPS (1km), Lengurbill Darul Mokam central mosque &

graveyard (400m), Rustom Ali Chowdhury Dakhil Madrasah (420m), at east side Boktatoli station (500m), Boktatoli jame mosque (500m), Middle sayakhola mosque (300m), Borobill GPS (500m), Middle sayakhola graveyard (300m), Sayakhola chorra (8m) and west side Paglirbill community clinic (100m), Shikderpara station (250m), West Sayakhola Kashem Ulum jame mosque (200m). Apart from this structure no other sensitive environmental, cultural, archaeological, religious sites exists.

A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas are shown below.



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive areas found in the areas, except some matured vegetation around the site. Several mosques, school and human settlement were found during the survey. It will not be affected by the construction works, as the activities will be carried out within the existing subproject boundary and necessary preventive and mitigation measures will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*

No. There is no existence of Elephant corridor/ route now, which have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) Potential impacts on remaining forests in/around camps Yes/No

N/A (This activity will be confined within the existing subproject area)

(3) Other issues:
No more mentionable issues rose.

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:
Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of vehicle-related pollutants 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/ preventable by mitigation measures.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, tractor, trailer, etc. move on roads adjacent to sub-project throughout the day and night generate noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation):

Landslide potential is low. There is low possibility of soil erosion or landslide during construction period of targeted sub-project. The impacts are negative but very small scale, site-specific within a relatively small area and adjustable by mitigation measures.

Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH):

Groundwater is the main source of potable water in the Sub-project area. The shallow depth is about 60 feet to 70 feet and deep tube well depth is 700 to 800 feet. In the sub-project area, deep

groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 600-800ft (Field survey, 2019). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer. Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)
Status of wildlife movement: N/A (None of the information was found about the wildlife movement in or across the area)
State of forestation: Patches of vegetation containing large and matured trees across the road side of the proposed subproject area are located within 200m radial distance.
Summary of water balance analysis (For water supply scheme only): N/A

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g. status of access road or any other facility required for sub-project to be viable): Two roads called North Borobill primary school connecting road and Moriccha-Paglirbill connecting road are available for access. It is possible to carry the construction materials on this road to the construction site with limited traffic flow since this road has small corridor to pass large vehicles.
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction: Toilet and water supply facilities will be ensured by the contractor in the vicinity of the construction area for all the components of the sub-project, electric connection will be established with the accommodation facility due for the workforce. Electricity is available in the area.
Possible location of labor camps: Labor camp can be established along the road since there are available open private lands. One possible location will be besides the Sayakhola station. However, this will have to be done with the consent of land owner under a mutual agreement, with the supervision of the Engineer in charge.
Requirement and type of raw materials (e.g. sand, stone, wood, etc.): i) Bricks ii) Sand iii) cement iv) Gravel v) water vi) Aggregates vi) steels vii) Bitumen are the most common type of road materials used in construction.

Identification of access road for transportation (Yes/No): Yes. Two roads called North Borobill primary school connecting road and Moriccha-Paglirbill connecting road are available for access.
Location identification for raw material storage: Adjacent to labor camp or different location is available. However this will need placement on open fields and should be consulted with local committee. Material storage area must be well fenced and materials will be covered with tarpaulins.
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.): Earth/ mud, plastics, brick chips, dust from bricks during construction of project components will be produce. Also sludge will be produced from labor camp latrines and kitchen waste mostly composing of organic matters as fiber, starch, carbohydrates and proteins. 10% of the kitchen waste may be classified as plastics or non-biodegradables. Solid waste may amount to 30 kg daily and sludge may amount to 5 kg per day.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g. Solids wastes, liquid wastes, etc.): **Solid waste:** Residual waste from the labor camps will be generated. Equipment maintenance/vehicles on-site and scrap material will occur during construction works which are mostly solid waste. Leftover oils or spills from machinery can be a high probability generating liquid waste. Waste from civil works. And the quantity will be tentatively 200 kg. **Liquid waste**: During construction period fecal sludge will be generated from the labor camp and the quantity would be nearly 6 kg per day, which would be reduced in weight in course of time. Leftover oils or spills from machinery can be a high probability generating liquid waste.
Type and quantity of raw materials used (wood, bricks, cement, water, etc.): **Type:** i) Bricks, ii) Sand iii) cement iv) aggregates v) water vi) concretes vii) Bitumen are the most common type of road materials used in construction. **Quantity**: It is difficult to give exact figures of construction waste produced on a typical construction site.
Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards: No such vegetation is present in the right of way. Specific soil amount is not needed for the project. The current condition explains that there is no aggregated soil on the right of way.

Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) The possibility is Medium, for stagnant water bodies to occur. Because water usage will be higher during the construction period. By default, this area has no water logging troubles due to being natural channels. Moreover, no possibilities of stagnation of water in long run. So, local communities have stated that they do not have severe troubles with mosquitos or other disease vectors.
Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) Paglirbill khal is near about the sub project location, but not to disturbance or modification of existing drainage channel during construction phase.
Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. Because under this interventions, there is very little scope of damage to terrestrial or aquatic ecosystems or endangered species.
Activities that can lead to landslides, slumps, slips and other mass movements in road cuts: Scope of work leading to low scale effects of landslide. The impacts are negative but short-term and site-specific. It can be managed through mitigation measures.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description) Low, since both sides of the road is more or less similar elevation. The concentrated outflow will be managed since the sub-project has included drains.
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: No
Chance of long-term or semi-permanent destruction of soils: (High/Medium/Low with description) No

Possibility of odor and water, soil quality impacts from SWM and FSM disposal system: (High/Medium/Low with description) No
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) There is no possibility of stagnant water bodies remained for encouraging mosquito breeding and other disease vectors, during the operation phase.
Likely direct and indirect impacts on economic development in the project areas by the sub-project: Construction or implementation of a road project substantially contributes to the development of the project areas. It surely improves the communication network, reduces the transport time, increases the trade and business in/around the areas, and ensures access to better living conditions with amenities, better educational and job opportunities and health facilities. Thus, the direct and indirect impacts on economic development in the project areas would be enormous by this sub-project.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No existing drainage channels or surface water bodies found in the project area, therefore, no such effect can be anticipated
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. There are no protected areas in or around project sites, and no known areas of ecological interest.
Activities leading to landslides, slumps, slips and other mass movements in road cuts: The entire sub-project component area is nearly flat, thus no such type of impacts is anticipated.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) No
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: Improved communication will definitely increase the traffic/ vehicular movement, which must increase the light and noise pollution, but air pollution effect will not be increased significantly, as the proposed BC road will reduce the pollution generated from dust on the muddy road, especially during the dry season and if the vehicles are maintained in good conditions

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)**.**

Section D: Environmental Screening Summary of the Work Package-W23.15

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
1: Sub-Project Interventions	**Air quality**	Under the subproject intervention the overall score is **low**.	• Limiting earthworks; • Watering of dry exposed surfaces and stockpiles of aggregates at least twice daily, as necessary; • Requiring trucks delivering aggregates or bricks and cement to have tarpaulin cover and Limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Covering of trucks; • Records of air quality inspection;	Visual monitoring of air quality and if requires, air quality test (CO, $PM_{2.5,10}$) once in construction period in winter season.
	Soil impacts	Under the sub-project intervention the overall score is **low.**	• Precautions might be taken when rainstorms are likely, when a rainstorm is imminent or forecast, and actions to be taken during or after rainstorms. • The earthwork sites where exposed land surface is vulnerable to runoff shall be consolidated and/or covered. • The material stockpile sites shall be far away from surface water bodies and areas prone to surface run-off. Loose materials shall be bagged and covered. • Channels, earth bunds, netting, tarpaulin and or sand bag barriers	Construction Contractor monitored by Consultant and PIU	• No visible degradation to nearby drainages, • *khals* or water bodies due to soil erosion. • Rain storms in construction phase.	Monitoring as weekly basis.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
			shall be used on site to manage surface water runoff and minimize erosion. • The overall slope of the work areas and construction yards shall be kept to a minimum to reduce the erosive potential of surface water flows elsewhere.			
	Hydrology (surface and groundwater)	Under the subproject intervention the overall score is **low**.	• All precautions to store chemicals/oil/fuel properly so that no chance of spill. • Workers must specify waste dump locations to avoid littering which in turn might negatively affect surface and ground water. • Monitor water quality according to the environmental management plan.	Construction Contractor and monitored by Consultant and PIU	• Areas for stockpiles, storage of fuels and lubricants and waste materials; • Records of water quality inspection; Water Quality Test • (National Drinking Water Quality Standard Parameters)if requires; • No visible degradation to nearby drainages, *khals* or water bodies due to construction	Water quality test (mainly GW) twice during the construction period in six months interval.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
					activities. • Records should be kept and logged.	
2: Pre-construction Phase	**Sanitation, water supply**	Under the subproject intervention the overall score is **low**.	• Provide suitable housing, adequate supplies of potable water, and toilet and bathing facilities within labor camp area for the assigned laborer. • Provide means for disposing of wastewater from toilets, baths and food preparation areas either through a septic tank and soak away, or holding tank with removal by vacuum truck. • Records for any type of training or awareness building sessions must be kept at site.	Construction Contractor and monitored by Consultant and PIU	• Site-specific H&S Plan; • Records of supply of uncontaminated water; • Record of Health &Safety orientation trainings; • Condition of sanitation facilities for workers	Visual inspection by PIU and supervision consultants on monthly basis
	Transportation	Under the subproject intervention the overall score is **low.**	• Contractor should verify vehicles for the suitability of carrying, loading and unloading of materials	Construction Contractor and monitored by Consultant and PIU	• Record of regular inspection. • Record of accidents/incidents	Monthly monitoring.
	Storage of construction materials	Under the subproject intervention the	• Orienting concerned person and team assigned for the construction work.	Construction Contractor and monitored by Consultant and PIU	• List of materials and sources of materials;	During implementation phase, as necessary with discussion with

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
		overall score is **low**.				PIU, Consultant
3: Construction Phase	**Wastes**	Under the sub-project intervention the overall score is **low.**	• Prepare and implement on-site waste water runoff and labor camp waste management plan approved by PIU and consultants. • Wastes must be placed in the designated bins which must be regularly emptied. These shall remain within demarcated areas and shall be designed to prevent wastes from being blown out by wind. • All waste must be removed from the site and transported to a disposal site.	Construction Contractor and monitored by Consultant and PIU	• Complaints from community; • Regular inspection of waste management activity; • Waste disposal record.	As work weekly progresses
	Cut and fill Activities (Cutting of hill slope and earth removal from borrow areas caused for soil erosion and landslides)	Under the sub-project intervention, the overall score is low.	• During construction cut and fill will be balanced as far as is possible. Designs shall ensure that as far as possible all cut and fill activities are balanced • Proper care will be taken during cutting and filling so that slope or toe of the road embankment remain within the right of way and does not disturb the crop.	Contractor, environmental specialist of D&SC	• Location of road alignment and slope.	Daily as work progresses

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
	Storage of materials	Protected and safety storage to be needed for construction materials storage. Not interrupt natural land contours, disturbance in natural drainage patterns and logging of water and the overall score is **low.**	• With the assistance from site management committee in Camp to identify the storage site and other requirements, which will be approved by PIU and consultants.	Construction Contractor and monitored by Consultant and PIU	• List of materials and sources of materials; • Storage areas for materials and equipment.	Monthly basis during implementation phase, as necessary with discussion with PIU, Consultant
	Removal of Vegetation (May cause soil erosion and their deposition on nearby crop field, affecting soil quality and productivity)	Under the sub-project intervention, the overall score is **low.**	• If during detailed design cutting of trees is required, compensatory plantation for trees lost at a rate of 5 trees for every tree cut. • Prevent workers or any other person from removing and damaging any flora (plant/vegetation) and fauna.	Contractor, environmental specialist of D&SC	• Complaints from community;	Daily

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
	Noise pollution	Under the subproject intervention the overall score is **low.**	• Consultation with affected people; not to operate noisy equipment during working period; • No noisy work after 5.00 pm. • Sound suppression for equipment; • Ear protection for workers. • Conduct noise quality monitoring as per EMP.	Construction Contractor and monitored by Consultant and PIU	• Number of complaints from stakeholders; • Use of silencers in noise-producing equipment and sound barriers; • Noise Level following decibel meter (dB)	Inspection by PIU and supervision consultants on monthly basis;
	Air pollution	Under the subproject intervention the overall score is **low.**	• Water spraying for dust control; construction materials with potential for significant dust generation shall be covered; no smoke emitting equipment; and limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Construction Contractor and monitored by Consultant and PIU	• Location of stockpiles; • Number of complaints from stakeholders; • Records of air quality inspection.	Visual observation and monitoring of air quality during construction period.
	Road Safety and Accidents	Under the subproject intervention the overall score is **low.**	• Erection of suitable signage at construction sites • Direct observation and discussion with local people • Restrict the transport of oversize loads. • Operate construction vehicles to non-peak periods (night) to minimize the traffic disruption. • Enforce on-site and access road speed limits.	Construction Contractor, environmental specialist of D&Sc.	• Complaints from communities, pedestrians	Day basis during work time

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	**Frequency**
			• The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc. • Local residents should be kept informed about planned Works			
4. Post Construction	**Road Safety**	Under the issue the overall score is **low**.	• Install traffic signs for speed limit, speed breaker where needed, Mile post and create adequate ***traffic*** detours, and sufficient ***signage*** & ***warning*** signs, Post speed limits and suitable bending on the road. • The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required or as suggested by the Environmental Specialist of D&Sc.	Construction Contractor, environmental specialist of D&Sc	• Road signage and safety instruments at suitable locations and chainage	Immediately after the construction work is over.
	Tree re plantation	Under the issue the overall score is **low**.	• Replantation of trees during monsoon period • Maintain of trees properly • Check survival of trees and replant the dead trees	Construction Contractor, environmental specialist of D&Sc	• Number of complaints from stakeholders; • Records of trees number and tree plantation inspection	Immediately after the construction work is over.
5. Operatio	**Maintenance of road and**	Under the issue	• No advertisement/boardings shall be allowed within the Right of Way	LGED	• Number of complaints from	During Operation under LGED's

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/Institution Responsible	Monitoring Suggestions	
					Indicator	Frequency
nal Phase	**assets** (Road accidents may increase due to higher number of vehicles using the roads at increased speeds)	the overall score is **low**.	limits of the project road. • Regular maintenance and cleaning of assets such as sign boards, road safety sign etc. shall be undertaken. • Clear smooth speed breaker/rough surfaces should be clear in views. • Regular maintenance of road surface and shoulders.		stakeholders	regular maintenance program in each 3 years.

* Overall Impact Score: High = Likely to cause long-term E&S impacts; Medium = Likely to cause temporary impacts; Low = Likely to cause little, short-term impacts

**Post-construction phase denotes the time period contractor use to clear and clean up the sites after the construction work is ended, perform tree plantation, grass turfing, and minor rectification till the official handing over the site to LGED, or owner of the site.

Recommendation for further environmental and social assessment and/or site specific environmental and social management plan: Yes

**If yes, please specify what assessments/plans would be required.* Mention some recommendation on E&S assessment …. ESMP

If site specific environmental and social management plan (ESMP) is followed the impacts can be mitigated and monitored. ESMP is attached.

Appendix-2: Environmental and Social Management Plan (ESMP)

ESMP for Access and evacuation Roads; *(LGED/EMCRP-W23.15): Paglir bill saya Khola Road Id: 422945082*

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
Pre-Construction Stage	Loss of land / and other physical assets	• No land acquisition is allowed within this sub-project activities So, there are no any mitigation measures according to this impact.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of livelihood	• Under this subproject, there is no scope of negative impact of adjacent livelihoods	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Stakeholders Engagement	• All of the project stakeholders should be consulted • Separate community level consultation meeting with the potential affected HHs • Consultation meeting with host communities about the project objectives and scope of works	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of right to access	• Project to ensure thorough analysis of alternatives that access enjoyed by the community remains intact. • In case of unavoidable circumstances, alternative access will be provided.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Site Selection & implementing interventions: Human-elephant conflict	• Selection of sub-project sites and all implementing interventions must take place outside of the elephant corridor/influence area.	PIU	Environmental Consultant of PIU, PSC
Pre-Construction Stage	Site Preparation: Soil Erosion; Alteration of natural drainage	• Our selected sites avoided the low land near the water bodies or natural flow path to avoid the flash flood or any kind or surface runoff.	PIU & Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Tubewell location within the construction site is not near to any kinds of latrine and soaks well which could be contaminated by those. • After completing the development, we restored the place as like before to avoid the cut and fill operational problems. • This site is in the local community, so we discussed with the local community to avoid any conflicts related local habitation, culture. • Sub project intervention mustavoid of natural disturbance of existing slop and natural drainage. • The contractor ensuring sound environment for the local residents near the sub project site.		
Construction Activity	Noise from construction works	• Construction activities mostly will finish at day time within 05 PM, and must confirm proper measures for avoiding any disturbance. • All Personal Protective Equipments (PPEs) must be ensured in sites before starting any kinds of construction works.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Dust	• Acceptable range of emission of CO, particulate matter [SPM (**Suspended particulate matter)**, PM2.5, 10] and Hydrocarbons must be maintained through good construction work practices • Dust generation must be limited as a result of clearing, leveling and site grading operations with using water florescent manually and through water	Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		pipes. • Dust generation due to vehicle movement on connecting road shall be controlled by watering the path at limited level		
Construction Activity	Safety Issues	• Unauthorized entry is completely prohibited in our site and take necessary measures for preventing this problem • Before works started Contractor must provide proper training and guidelines on health and safety issues to the labors and associated staffs. • Records of every training must be kept at site. • All kinds of Child labour are completely prohibited in every site. • Every construction materials storage site will be well fenced by Tin and safety caution tape.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Traffic Management	• Contractors will maintain proper route for traffic management which is to beconsulted with and confirmed by the Executive Engineer of Cox's Bazar.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Conflicts with existing users due to the scarcity of resource base.	• A detailed assessment of the available resources and consent of the local representative for withdrawal of water from existing surface water sources shall be taken. • If ground water is withdrawn, adequate approvals from the appropriate department need to be undertaken before setting up bore wells. • Any type of consent letter or agreement for	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		withdrawing water from either surface or underground sources will be kept on site. • Local community must be consulted before any construction works starts.		
Construction Activity	Increase in road accidents	• Maintain safety measures during the movement of heavy machinery and equipment. • Local community will be trained up on traffic management and awareness.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Labour Base Camp: Conflicts with the local residents	• Awareness building session will be undertaken about prevention of child abuse, child marriage, GBV, sexual harassment, trafficking of women and children as well as illegal drug trade. Written records of this awareness building session shall be kept on site. • Work force should be prohibited from disturbing the flora, fauna including hunting of animals, wildlife hunting, poaching and tree felling. • Adequate facilities ensuring sanitation for labour camps will be put in place • Treated water will be made available at site for drinking purpose. • Adequate accommodation arrangements for labour forces. • Labor code of conduct is to be disclosed through consultation.	Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Construction Activity	Waste Management: Improper management and handling of	Preparation of a waste management plan covering the following aspects:	Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
	hazardous and non-hazardous waste during construction.	• Residual waste from the temporary accommodation facilities for labor Waste and from equipment maintenance/vehicles on-site • After completion of construction works. So, recycling process is not applicable. • Proper consents for hazardous waste management.		
Construction Activity	Health & Safety Risks: • The potential for exposure to safety events such as tripping, working at height activities, fire from hot works, smoking, failure in electrical installation, mobile plant and vehicles, and electrical shocks. • Exposure to health events during construction activities such as manual handling and musculoskeletal disorders, hand-arm vibration, temporary or permanent hearing loss, heat stress, and dermatitis.	• All construction equipment will be properly inspected timely. • The risk assessment will be prepared and communicated prior to the commencement of work for all types of work activities on site. • Preparation of proper walkways and clearly designation as a walkway has to be ensured; all walkways shall be provided with good conditions underfoot; signposted and with adequate lighting. • Proper Signpost at any slippery areas will be ensured in construction site. • Fire extinguishers will be located at identified fire points around the site. The extinguishers must be appropriate to the nature of the potential fire. • This sub project has Proper communicative emergency response plan (ERP) with all parties, the ERP to consider such things as specific foreseeable emergency situations, organizational roles and authorities' responsibilities and expertise, emergency response and evacuation procedure and personnel will	PIU & Contractor	Environmental Consultant as well as Social Development and Gender Specialists of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		be trained and drilled to test and ensure the coherence with the plan. • All people of construction site will be concerned about the safety and maintenance of Electrical equipment; works will be carried out on live systems. • Provision to first aid box in sub-project areas will be ensured. • Proper Emergency evacuation response plan will exist in sub-project area. • All safety equipment will be available in sub-project site (safety, size, power, efficiency, ergonomics, cost, user acceptability etc.), the lowest vibration tools will be provided that are suitable and can do the works. • Awareness training will be given to all personnel involved during the construction phase in order to highlight the heat related illnesses of working in hot conditions such as heat cramps, heat exhaustion, heat stroke, and dehydration. Written records of this awareness training shall be kept on site. • Adequate quantities of drinking water will be available at all Sites, on different locations within the site. • Provision to maintain proper PPE wherever necessary and to ensure that there are satisfactory washing and changing facilities. • Provision to ensure all workers exposed to a risk are aware of the possible dangers and also given thorough		

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		training on how to protect themselves and there should be effective supervision to ensure that the correct methods are being used.		
Operation &Maintenance	Noise disturbances to fauna	• Provision to maintain noise and vibration from the operation and maintenance of machinery and equipment by proper monitoring and measures. • Provision to take necessary lighting, caution for the works and necessary maintenance should be done in day light.	PIU	Environmental Consultant of PIU, PSC. Union Member
Construction activity	Odours and pollution caused by leaking latrines and faecal sludge, and solid wastes impacting surrounding water bodies, flora and fauna	• Preventative maintenance schedule should be followed. • Solid organic wastes should be stored in bins and/ or skips and emptied regularly at a designated waste disposal area away from the camp site. If no designated site is available within the reach, a dug-hole at a nearby place can be used with periodic filling with soil layer for preventing pollution and generating nutrient rich compost soil over time.	PIU	Environmental Consultant of PIU, PSC. Union Member
Decommissioning during the project implementation period (including site clearance after the construction)	The impacts are similar to those listed in construction stage: • Pollution from waste materials • Health & Safety risks to workers and local community	• Contractor must prepare a demolition and waste management plan including following directive aspects given hereunder.	PIU / Contractor	Environmental Consultant of PIU, and Executive Engineer of Cox's Bazar

Waste Management Plan:

The Contractor shall develop a waste management plan for various specific waste streams (e.g., reusable waste, flammable waste, construction debris, food and organic waste etc.) prior to commencing of construction and submit to LGED for approval. The plans must include following principles or series of actions, which will be carried out/followed by the contractor and supervised by the Field level Environmental Specialist and Social Development Specialist.

For wastes:

- The quantity of waste materials shall be minimized by 3R (Reduce, Recycle and Reuse) approach, and wastes shall be segregated accordingly, wherever practical; and stored in designated places/facilities in the site.
- Construction site shall be maintained in a cleaner, tidy and safe condition and appropriate facilities shall be provided and maintained as temporary storage of all wastes before transportation and final disposal.
- Hazardous waste viz. waste oil etc. will be collected and stored in a paved and bounded area and subsequently sold to authorized recyclers.
- The scrap material generated from related construction activities will be collected and stored separately in the stack yard and sold to local recyclers.
- All wastes generated during construction shall be disposed off in an environmentally acceptable manner. This will include consideration of the nature and location of disposal site, so as to cause less environmental impact.
- Other leftover non-hazardous wastes, including construction debris shall be transported to an approved disposal site by pick up tracks or back loaded vehicles with proper care.
- Organic wastes produced in the camp site during the construction period shall be collected and transported in vehicles covered with tarps or nets to prevent spilling waste along the route to the designated disposal site;
- Burning of any type of wastes in the construction site shall be prohibited completely.

Prepared by: Harogopal Kabiraj, Environmental Focal Person, +8801714980171

Tanvir Ahsan Haque, Environmental Specialist, +8801688117059

Ms. Sadia Azad, Disaster and Climate Change Specialist, PIU.

Reviewed by: Md. Saiful Islam, Field Level Environmental Specialist, +8801913442006

Appendix-3: Cost of Environmental Mitigation and Enhancement Works in BOQ for each sub-project under work package EMCRP/W23.15

In consideration to the above-mentioned environmental impacts and their mitigation measures for all sub-projects, individual BOQ for each component has been prepared. Following tables will illustrate such items of enhancement and impact mitigation works as well as considering the emerged situation of COVID-19, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites.

Cost of Environmental Enhancement Works for W23-15 in BOQ

Sl no.	Description of item	Quantity	Unit price	Total amount
1.	**Grass Turfing** Turfing on embankment top and slope & any critical place with good quality turf supplied by the contractor of not less than 225mm square in dimension including placing and watering till grass is fully grown, etc. all complete as per direction of E.I.C. (Payment to be made only when grass is fully grown)	6907.8 Sq.m	@38.15 Tk. Per sqm	263,532.57
2.	**Dust suppression measures** Dust suppression measures like water sprinkling on aggregates/unpaved roads, in and around the work site and as per direction of E-I-C	2310.0m	@ 2.56 BDT	5,913.60
3.	**Water Supply and Sanitation** Providing and maintaining adequate portable water supply, sanitation, cleanliness facilities at camp site and work site to the entire satisfaction of Engineer-in-charge. **Temporary Toilet:** Construction of temporary toilets in work site/ rest area complete as per design and specifications and approved by the Engineer-in-Charge. There should be 1 camp in each site. In each camp, there should be 1 no of toilet for women and 1 no of toilet for men.	2 nos.	@12822.86 per toilet	25,645.72
4.	**First Aid Box** Supplying, equipping and maintaining adequate first-aid box throughout the working period at worksite and site office, and erect conspicuous notice boards directing	1 no.	LS @5000 Tk. Per box	5,000

	where these are situated and providing all requisite emergency medical first aid kits, including complying with the government medical or labour requirements at all times, and provide, equip and maintain necessary dressing kits throughout the working period for attending minor injuries, etc. all complete as per requirement and full satisfaction of Engineer-in-charge.			
5.	**Drinking Water Facilities** Providing continuous adequate drinking water supply at worksite and site office as well by installing necessary tube-well/s where applicable or any other means depending on local situation, also providing essential arrangement for storing drinking water by supplying portable best quality water tank equivalent to Gazi/Padma of adequate capacity depending on the number of users, including supplying 1 (one) no. best quality water filter of minimum capacity 30 liters with necessary kits, etc. all complete as per satisfaction and direction of the Engineer-in-charge.	2 no.	LS @ Tk. 30,000	60,000
6.	**Traffic Management** Maintaining traffic management at worksite from time of commencement of contractor's activities to time of completion activities, including ensuring that the road is safe for users, providing a safe working area for those involved in work on trafficked network and minimizing any disruption to smooth flow of traffic (this includes providing necessary barricades, warning signs/lights, guide signs, flagmen, maintaining diversion roads by cutting, filling, constructing, etc. or by any other means) in accordance with the full satisfaction of the Engineering-in-charge.	1 no.	LS @ Tk. 15,000	15,000
7.	**Personal Protection Equipment for Workers** Providing and maintaining appropriate (safe design, fit and comfort) personal protection equipment (PPE) to ensure the highest possible protection for employees in establishing and maintaining a safe and healthful working environment at workplace, including demonstrating, providing training on proper understanding and development of skill in the use of PPE, including supplying (i) best quality safety jacket, (ii) suitable hand protection gloves, (iii) appropriate foot protection shoes, (iv)	LS	LS @ Tk 30,000	30,000

	best quality safety helmets, face shields, ear muffs etc. (v) suitable eye protection goggles			
8.	**Tree plantation** Tree plantation to compensate the felled down trees and enhance the ecological condition in the subproject area- preferably local fruits, flowers, medicinal and ornamental trees- Mango, Jackfruit, Jam, Kathbadam, Chalta, Krisnachura, Bokul, Jarul, Polash, Kadom, Shimul, Neem, Arjun, Amloki, Horitoki, Bohera, Mahogany, Palm Tree, Chambal, Rain Tree, Shil koroi, Satim, Sishu (including protection, fencing and conservation during project defect liability period): Preferably at both sides of Road where space is available (fencing as per LGED rate schedule 5.26.14) (Contractors will also be instructed by the consultant and PIU prior to the tree plantation work) at an interval of 10 feet.	300 nos.	@ Tk. 1000	300,000
9.	**Motivation training** Motivation training (twice: before and after construction start) of the Upazila Engineer 'sand Contractor's representatives on safety practice and as per direction of the E.I.C.	1 no.	LS @ Tk. 10,000	10,000
10.	**Waste disposal facility** Temporary camp site waste disposal facility improvement 2 nos. (1 no of organic waste and 1 no of inorganic waste disposal facility) and as per direction of E.I.C.	LS	@ Tk. 5000	5,000
11.	**Water Test (Drinking Water samples)** Water samples are to be collected periodically (half yearly) from the tube well at labor shed area for laboratory analysis of different parameters such as pH, arsenic, iron, chloride, hardness, total dissolved solids, nitrate, nitrite, coliform, electrical conductivity etc. all complete as per direction of E.I.C. (including the cost of actual fees for testing from reputed laboratory and report) as desired by E.I.C.	LS	@ Tk. 5000	5,000
12.	**Working labour shed:** Construction of Labor shed (Size: 30'x20') with C.I sheet Roofing, Tarza fencing and brick soling floor as per requirement and direction of the E-I-C.	1 no.	LS @ Tk. 30,000	30,000

13.	**<u>Environmental management</u>** Environmental management costs of the Environment & Social/ Safeguard Personnel for Environmental and Social Management and Monitoring during construction and operation phase for their salary & transport (Net payment excluding Tax &VAT). And as per direction of the E.I.C. **(One Safeguard Personnel for R6, R8, R9, R12 & R15)**	1 person	Monthly basis @Tk. 35,000.00 for 12 months. One person covering 5 roads i.e.35,000Tk.*12months*(1/5 one road).	84,000.00
	Subtotal Bill: Environmental facilities			**839,091.89**

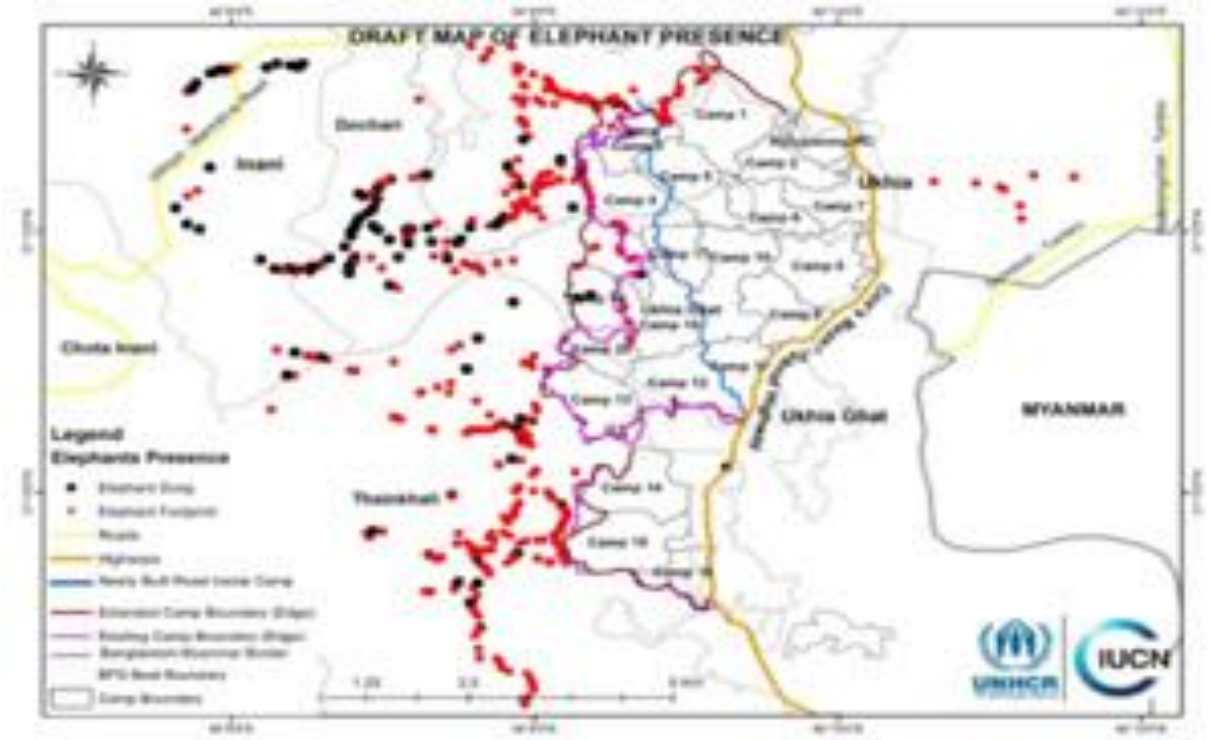
<u>Cost of H&S Measures under COVID 19 Situations for W23-15</u>

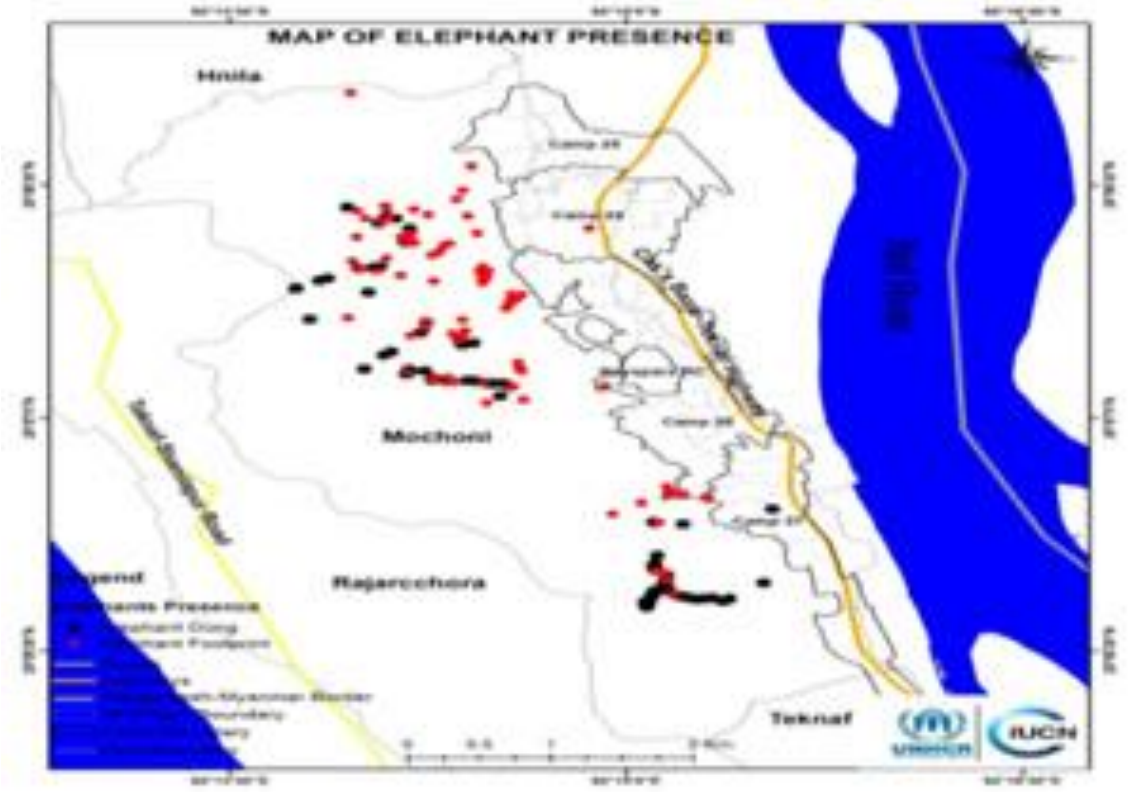
Considering the emerged situation, following budget/cost has been estimated for the protection of workers and staffs working or engaged in construction sites. The cost is estimated counting 46 workers for 270 active working days (9 months in a year) in a contract period for one site under this package (EMCRP/W-23.15).

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
1.	Non-Contact IR Digital Thermometer	01 nos. in each site	N/A	N/A	5,000.00	1	5,000.00	Each site office will have a thermometer for checking body temperature every morning at the entrance of the working site
2.	Wash Basin with Small Water Tank, Bucket and Mug (or piped water supply)	01 nos. in each site	N/A	01 nos. in each camp	10,000.00	2	20,000.00	Wash basin to be installed at favorable locations immediately after the entrance to the facility
3.	Trash bin (covered)/Paddle Bin	01 nos. in each site	N/A	01 nos. in each camp	550.00	2	1,100.00	

Sl. No.	Description of Item	Number of items to be used/kept at			Unit Cost (BDT.)	No. of items	Total Cost/ Price (BDT.)	Remarks/ Justification
		Site Office	Working Site	Labor Camp				
4.	Bar Soaps (150 gm each)	124		155	50.00	279	13,950.00	To be placed in a case/holder on the basin, for washing hands for max. 51 people a day and showering of 46 workers in each labor camp.
5.	Hand Sanitizer (2 nos. 250 ml bottle and 5 liter Can for Refill)	2 bottles and 1 Can for each site	N/A	N/A	4,000.00	1	4,000.00	2 bottles and a 5 litre can for each Site office
6.	Face Shield/ Protective Safety Goggles	30 nos. for each site		N/A	400.00	30	12,000.00	For labors who work in close contact, 30 in each site
7.	One time Mask (Disposable) for Contractors' Staffs	5 nos. each day in each site		N/A	12.00	1350	16,200.00	Reusing N95/KN95 mask will not be a manageable option in field scenario, one time disposable medical/surgery mask a good option instead.
8.	Cloth mask for Workers	N/A	46 nos. for each labor camp		35.00	828	28,980.00	A worker will use a mask for 15 days with everyday washing
9.	Floor Cleaner (1 litre Can)	1.5 Can	N/A	5 Can	250.00	6.5	1,625.00	
10.	Detergent Cleaner	N/A	2 kg in each camp/month		400.00	18	7,200.00	To be used for washing clothes, masks and tools & equipment, etc.
11.	Miscellaneous cost				20,000.00	1	20,000.00	Contingency cost for medical emergency and compensation for workers, subject to proper documentation
	Grand Total						**130,055.00**	

Appendix-4: Elephant Migration Routes Map





Elephant presence map (latest information published on 24 May 2018)

Appendix-5: Location Map of Sub-project component

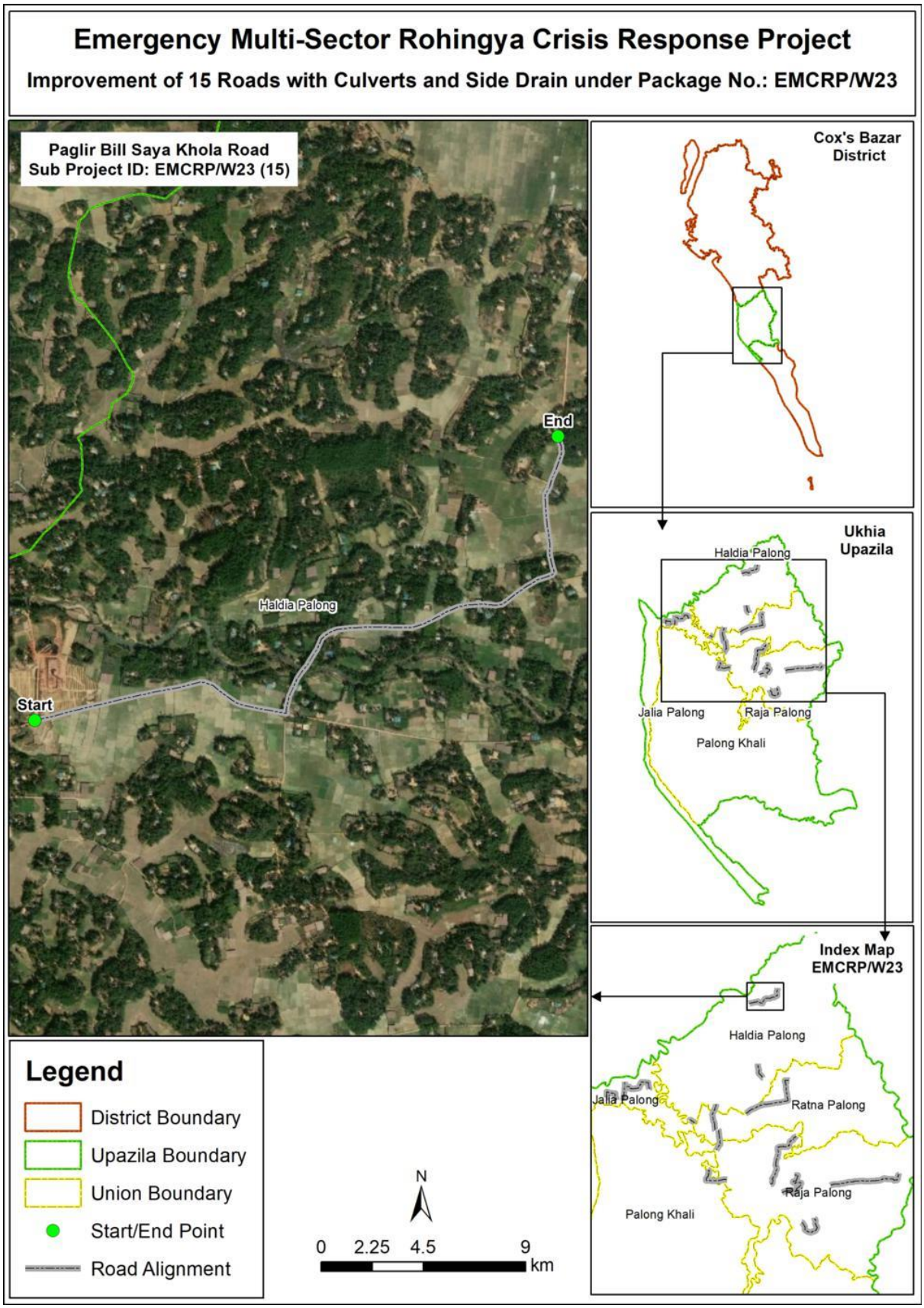
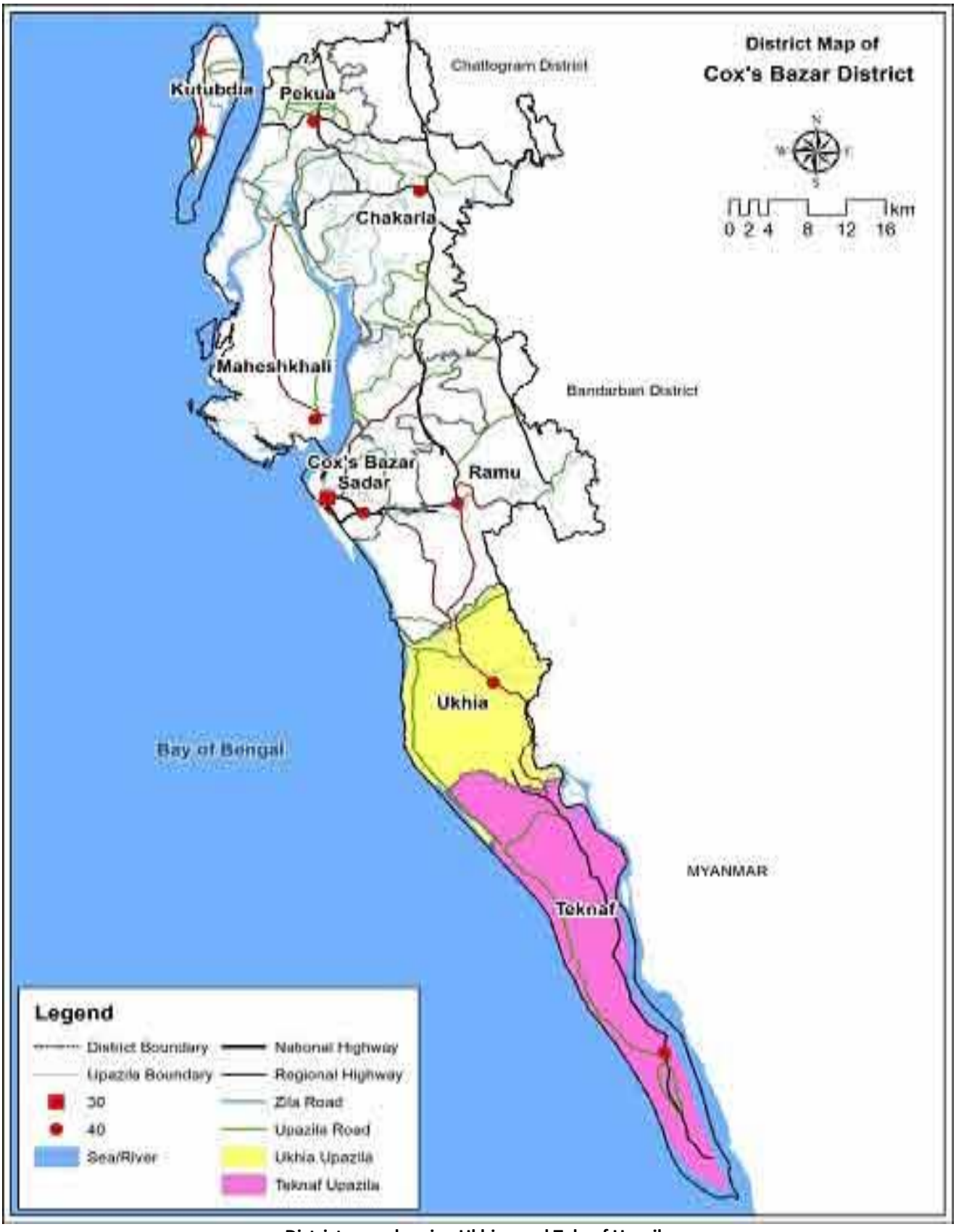
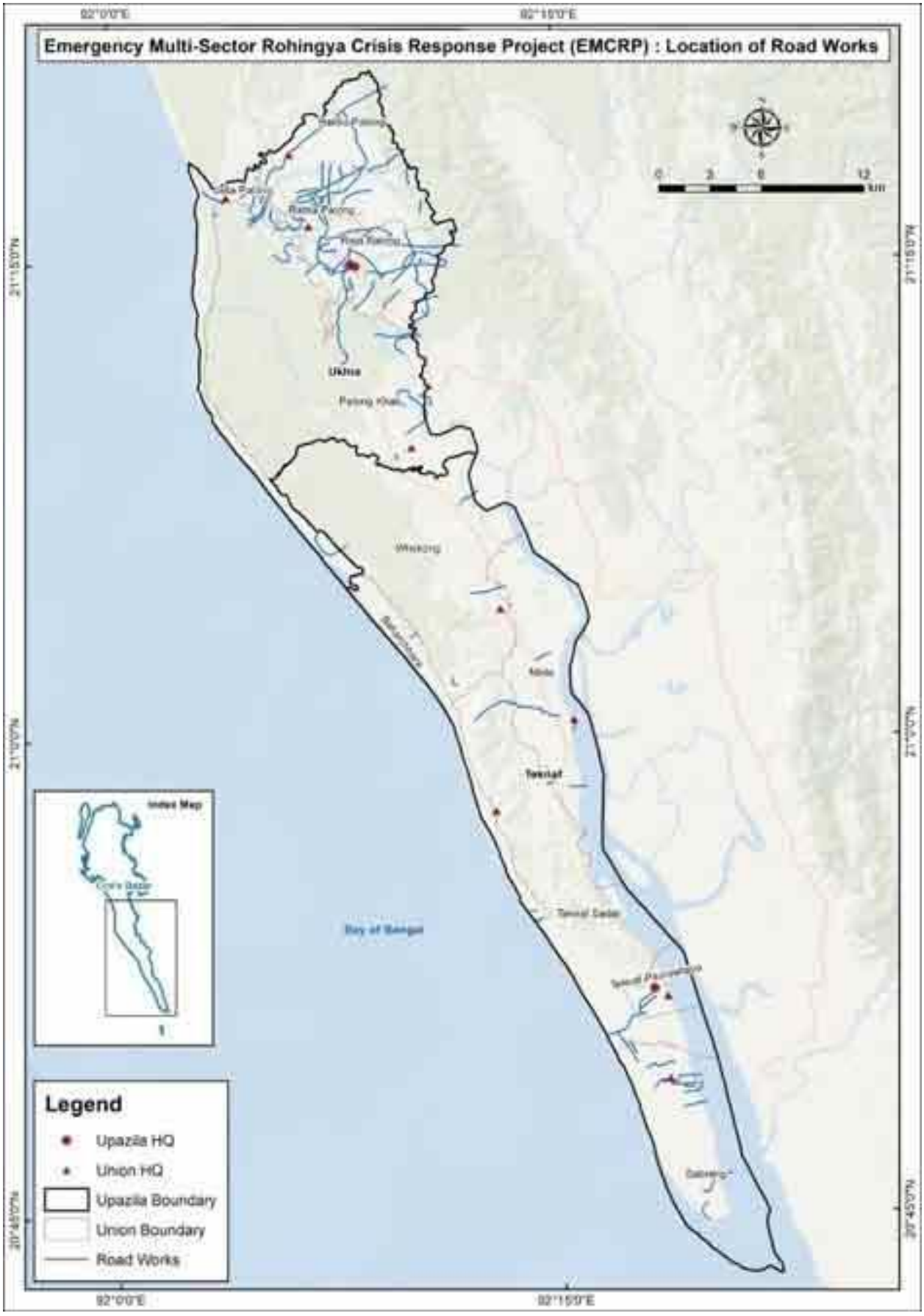


Figure: Location Map of W23-15



District map showing Ukhiya and Teknaf Upazila



Upazila map locating proposed roads