

Semi-annual Environmental Monitoring Report

**Grant No. 0582- BAN
June 2020**

Emergency Assistance Project

This Semi-annual Environmental Monitoring Report is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

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Emergency Assistance Project

ADB Project 52174-001 | Grant 0582-BAN | TA 9546 BAN

Environmental Monitoring Report

Fourth Semi-Annual Environmental Monitoring Report

Reporting Period

January to June 2020

Implementing Agency

Local Government Engineering Department (LGED)

Department of Public Health Engineering (DPHE)

Ministry of Local Government, Rural Development and Cooperatives (MLGRDC)

Roads and Highways Department (RHD)

Ministry of Road Transport and Bridges

Bangladesh Rural Electrification Board (BREB)

Ministry of Power, Energy and Mineral Resources

June 2020

BAN: EMERGENCY ASSISTANCE PROJECT

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ABBREVIATIONS

ADB	Asian Development Bank
BCCSAP	Bangladesh Climate Change Strategy and Action Plan
BREB	Bangladesh Rural Electrification Board
DPHE	Department of Public Health Engineering
EAP	Emergency Assistance Project
EARF	Environmental Assessment and Review Framework
ECA	Environmental Conservation Act
ECC	Environmental Clearance Certificate
ECR	Environmental Conservation Rules
EIA	Environmental Impact Assessment
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ETP	Effluent Treatment Plant
GoB	Government of Bangladesh
H&S	Health and Safety
IEE	Initial Environmental Examination
LGED	Local Government Engineering Certificate
MPEMR	Ministry of Power, Energy and Mineral Resources
NFP	National Forest Policy
NOC	No Objection Certificate
RHD	Roads and Highways
RRRC	The Refugee Relief and Repatriation Commission
SPS	Safeguards Policy Statement
SSC	Site Clearance Certificate
ToR	Terms of Reference
UN	United Nations
US EPA	United States Environmental Protection Agency
WB	World Bank

Executive Summary

1 This report is the Fourth Semi-annual Environmental Monitoring Report (hereinafter refereed as EMR) of the ADB financed Emergency Assistance Project (ADB) in Bangladesh, which covers the period of January – June 2020. The report is produced to comply with the environmental scope stipulated in the sub-projects' Environmental Management Plans (EMPs) implemented by various Government Agencies/Departments under the project.

2 The Government of Bangladesh (GoB) requested Asian Development Bank (ADB) for grant support to provide basic infrastructure and essential services to displaced persons. Given the humanitarian need and heart-wrenching condition of the displaced persons, ADB is providing grant financing of \$100 million for the first phase of the project. ADB' support is focused, selective, and well-targeted in the areas of (i) road access to and within camps; (ii) water and sanitation; (iii) energy supply; and (iv) disaster risk mitigation. It builds on the support provided by GoB and complement support provided by the United Nations (UN) agencies, the World Bank (WB) and other agencies. With the principle of putting people first, the project seeks to ease the vulnerabilities and risk of hunger, disease, and disaster. The project is known as Emergency Assistance Project (Project No. 52174-001, Grant 0582-BAN).

3 ADB environmental safeguards objectives are: (i) to ensure the environmental soundness and sustainability of projects and (ii) to support the integration of environmental considerations into the project decision-making process. ADB environmental safeguards are triggered if a project is likely to have potential environmental risks and impacts.

4 The project has been categorized as B for environment under the ADB's Safeguards Policy Statement 2009 (SPS). Individual subprojects are screened and classified, and based on the classification, and where required, environmental assessments are undertaken and EMPs developed. Based on Schedule 1 of the ECR, subprojects are likely to require IEEs and EIAs.

5 Subprojects selected are not likely to have significant environmental impacts. Environmental guidelines for subproject selection in **Table 1** provide further guidance to avoid or minimize adverse impacts during the identification and finalization of subprojects.

Table 1 Environmental Guideline for new subproject

Component	Environmental Guidelines for Subproject Selection
Overall (Applicable to all Subprojects)	Comply with all applicable national and local laws, regulations, and standards.
	Comply with ADB's SPS.
	Avoid land acquisition and involuntary resettlement and have no impacts on indigenous peoples.
	Avoid protected areas and areas of historical/cultural value.
	Avoid building or setting-up construction camp sites along elephant migration routes
Transport Infrastructure	Do not build new* roads and avoid widening existing roads, as much as possible.
	Avoid hill cutting.
	Do not build new* bridges.
	Avoid cutting trees on the roadside and if any trees have to be removed, plant two new trees for every tree lost.
	Consult the relevant archaeological agency regarding archaeological potential subproject areas to ensure that these are located in areas where there is a low risk of chance finds.

6 The Department of Environment is responsible for environmental issues while forest issues are looked after Department of Forests. Over the years, the MoEFCC has adopted number of legal instrument in the form of Acts for the protection and conservation of the environment.

7 The important elements of ADB's resettlement policy statement (APS 2009) include the following:

- i. Compensation to replace lost assets, livelihood, and income;
- ii. Assistance for relocation, including provision of relocation sites with appropriate facilities and services; and
- iii. Assistance for rehabilitation to achieve at least the same level of well-being with the project as without it.

8 Refer to **Table 2** for the status of the respective component sub-projects with regard to compliance status to ADB's policy statement (APS 2009).

Table 2 ADB Safeguards Policy Status

ADB Safeguard Policy Statement	Contract Package Status				
	Cyclone Shelter Sub-project	Road Sub-project	Drainage/erosion Sub-project	Water Supply Sub-project	Others Sub-project
(i) Involuntary resettlement will be avoided whenever feasible.	complied	complied	complied	complied	complied
(ii) Where population displacement is unavoidable, it should be minimized.	No displacement	No displacement	No displacement	No displacement	No displacement
(iii) All lost assets acquired or affected will be compensated. Compensation is based on the principle of replacement cost.	NA	Matrix formulated	Matrix formulated	NA	NA
(iv) Each involuntary resettlement is conceived and executed as part of a development project or program. Affected persons need to be provided with sufficient resources to re-establish their livelihoods and homes with time-bound action in co-ordination with civil works.	NA	Provided in Compensation Matrix	Provided in Compensation Matrix	NA	NA
(v) Affected persons are to be fully informed and closely consulted.	complied	complied	complied	complied	complied
(vi) Affected persons are to be assisted to integrate economically and socially into host communities so that adverse impacts on the host communities are minimized and social harmony is promoted.	NA	NA	NA	NA	NA
(vii) The absence of a formal title to land is not a bar to ADB policy entitlements.	NA	NA	NA	NA	NA
(viii) Affected persons are to be identified and recorded as early as possible to establish their eligibility, through a census, which serves as a cut-off date, and prevents subsequent influx of	NA	complied	complied	NA	NA

ADB Safeguard Policy Statement	Contract Package Status				
	Cyclone Shelter Sub-project	Road Sub-project	Drainage/erosion Sub-project	Water Supply Sub-project	Others Sub-project
encroachers.					
(ix) Particular attention will be paid to vulnerable groups including those without legal title to land or other assets; households headed by women; the elderly or disabled; and indigenous groups. Assistance must be provided to help them improve their socio-economic status.	NA	complied	complied	NA	NA
(x) The full resettlement costs will be included in the presentation of project costs and benefits.	NA	NA	NA	NA	NA

9 To date 51 sub-projects have been finalized, instead of 60 sub-projects preliminarily identified in 2018. Of them BREB is implementing 9 subprojects, DPHE is carrying out 21 subprojects, LGED is executing 18 subprojects and RHD is implementing 3 subprojects. Of these subprojects 32 subprojects are identified as Category B according to ADB classification.

10 According to the ADP policy on environment, all the B category subprojects would require EMP and IEE reports before project implementation to ensure that the projects will be environmental viable and all the environmental laws, rules, restriction and policies of ADB and GoB are attained.

11 To date, 44 sub-projects have been awarded, 5 is at IFB and 2 is at bid preparation stage. However, out of 44 awarded subprojects 9 packages have already been completed. The summary status of the subprojects is given in in **Table 3**.

Table 3 Sub-project progress status of EAP (information up to 30 June 2020)

Executive Agency	Total Package	Contact awarded (completed)	Invitation for Bid	Bid preparation stage	Financial Progress
BREB	09	09 (3)	0	0	93%
DPHE	21	17 (5)	2	2	47%
LGED	18	15 (1)	3	0	73%
RHD	03	03 (0)	0	0	97%
Total	51	44 (9)	5	2	70%

12 To date (June 2020) out of 32 B category projects according to ADB classification, 30 IEEs (including 7 indicative IEE) have been drafted with 32 EMPs and 7 ECoPs. Some EMPs and subsequent IEEs are due to either design revision or additional survey work (those are stated as indicative IEEs). **Table 4** represents the status of preparation of safeguards documents.

Table 4 Summary Status of safeguards documents preparation for B category subprojects

Agency	Total B Category project	IEE	EMP	ECoP
DPHE	13	12	13	4
LGED	15	14	15	2
RHD	02	2	2	0
REB	02	2	2	1
Total	32	30	32	7

13 To date 13 EMPs for DPHE, 15 EMPs for LGED, 2 EMPs for BREB and 2 EMPs for RHD have been prepared. Of 30 IEEs, 12 IEEs for DPHE, 14 IEEs for LGED, 2 IEEs for RHD and 2 IEEs for BREB have been prepared.

14 During planning phase in 4th six-month January- June 2020, a total 10 visits have been conducted by the Environmental specialists appointed by ADB. Besides, until date 87 environmental safeguards monitoring visits have been conducted at different times during the current cycle (4th six-month January-June 2020) of monitoring period. See **Table 5** for details break down. Environmental compliance report has been submitted to the concerned EA and ADB based on site visit and follow ups were tracked to observe corrective measures and desired progress.

Table 5 Environmental safeguards monitoring visit conducted during Jan-Jun 2020

Site Visit During Planning Phase	Site Visit During Construction Phase				Total
	BREB	DPHE	LGED	RHD	
10	14	20	39	14	97

15 Besides monitoring visits, onsite trainings and meetings with contractors and EAs were conducted during the current monitoring period. Due to accessibility issues attributed to restrictions associated with Covid-19, less number of onsite training is conducted than last monitoring period. The site-based trainings were arranged by the environmental specialists to sensitize the contractors on implementing the environmental safeguards according to the EMPs and other contracts. A total 7 onsite trainings were arranged during January- June 2020 where total 73 participants were attended. Environmental specialists have given a brief lecture to the participants majorly focused on: occupational health and safety including PPEs, safety signage, housekeeping, waste management, management of hazardous materials, emergency procedures. Moreover, explained about the standard procedure for COVID-19 at the site. However, all the participants hold a very positive attitude towards the training program. Details of the monitoring visits are given in **Table 6** below.

Table 6 Environmental safeguards trainings conducted during Jan-Jun 2020

Onsite Training and No. of Participant				Total
BREB	DPHE	LGED	RHD	
2	1	2	1	7
5	6	42	20	73

16 Besides trainings, regular meetings with EAs were conducted on frequent basis to better coordinate with all the EAs. To date 24 meetings have been conducted. **Table 7** below represents the breakdown of meetings carried out by the environmental specialists.

Table 7 Meetings conducted on environmental safeguards implementation during Jan-Jun 2020

Meeting with EAs				Total
BREB	DPHE	LGED	RHD	
3	9	7	5	24

17 The concluding observations are as follows:

- The Environmental safeguards compliance performance of the EAs are improving slowly but steadily. The onsite training workshop and regular monitoring of ADB to sensitize the EAs and contractors seems to have obvious impact in this regard.
- Due to accessibility issues attributed to restrictions associated with Covid-19, implementation of environmental safeguards is hindered, causes increasing trend in noncompliance issues. In addition, inadequate safety measures are arranged to encounter COVID-19 in the construction sites.
- Environmental quality data from periodic monitoring indicated that in reference to the Bangladesh standard, the quality of ambient air and groundwater in the project area is within the standard limit. The noise level is within the safe limit for mixed areas with intermittent spikes due to proximity of the sites to the roads and human interference. However, the canal water has very low amount of Dissolved Oxygen which is unfavorable for aquatic life. TDS, BOD and COD of the canal water is comparatively higher than normal surface water due to lack of proper waste management in the camps.
- When same contractor is being awarded with more than one subproject, environmental compliance record appears to be poor.
- The implementing agencies need to consult with Environmental Safeguards consultants and ADB's safeguard division while proposing the project, before going into design. In this way, if the Safeguards division and Environmental Consultants checks the environmental and other related issues, the implementing agencies can go for designing and can save time by avoiding redesign issues.
- The implementing agencies need to better coordinate with the DoE and Forest Department. It appears the level of coordination is weak.

1 Introduction

1.1 BACKGROUND

18 This report is the Fourth Semi-annual Environmental Monitoring Report (hereinafter refereed as EMR) of the ADB financed Emergency Assistance Project (ADB) in Bangladesh, which covers the period of January – June 2020. The report is produced to comply with the environmental scope stipulated in the sub-projects' Environmental Management Plans (EMPs) implemented by Government Agencies/Departments under the project.

19 This report is drafted by the Environmental Specialist working for Bangladesh Residence Mission (BRM) of ADB to ensure preparation of Environmental Impact Assessment documents for various subprojects to comply with ADB and Bangladesh Government's environmental rules and regulations as well as implementation of Environmental mitigation measures during the construction phase. Environmental issues also are anticipated in this report to be identified in advance for avoidance and to ensure timely completion of the project.

1.2 THE PROJECT

20 The Government of Bangladesh (GoB) requested Asian Development Bank (ADB) for grant support to provide basic infrastructure and essential services to displaced persons. Given the humanitarian need and heart-wrenching condition of the displaced persons, ADB is providing grant financing of \$100 million for the first phase of the project. ADB' support is focused, selective, and well-targeted in the areas of (i) road access to and within camps; (ii) water and sanitation; (iii) energy supply; and (iv) disaster risk mitigation. It builds on the support provided by GoB and complement support provided by the United Nations (UN) agencies, the World Bank (WB) and other agencies. With the principle of putting people first, the project seeks to ease the vulnerabilities and risk of hunger, disease, and disaster. The project is known as Emergency Assistance Project (Project No. 52174-001, Grant 0582-BAN).

21 The project supports the Government of Bangladesh in addressing the immediate and urgent needs of the displaced persons from Myanmar in Cox's Bazar District, as identified by the United Nations (UN) in its Joint Response Plan (JRP) (displaced persons). The project mainly supports the improvement of water supply and sanitation, disaster risk management, sustainable energy supply, and access roads.

22 The impact of the project: Social recovery of affected communities accelerated in the sub-districts of Ukhia and Teknaf. The outcomes: Living conditions and resilience of affected communities improved. Four (04) outputs are expected from this project. They are:

- Output 01: Water supply and sanitation improved.
- Output 02: Disaster risk management strengthened
- Output 03: Energy sources provided
- Output 04: Access roads improved.

23 **Output 1: Water supply and sanitation improved.** This consists of providing the camp areas with (i) mobile water carriers for the distribution of treated water; (ii) community bathing facilities for women; (iii) mini piped water supply systems with a production tube well, distribution pipe network, and standpipe water

distribution points; (iv) an integrated waste management facility with collection system; and (v) small surface water treatment plants.

24 **Output 2: Disaster risk management strengthened.** This includes constructing in and around the camp areas (i) multipurpose cyclone shelters with emergency access roads, (ii) food distribution centers, (iii) hill slope protection and/or toe walls to resist landslides, and (iv) storm water drainage networks. The project also provides lightning arresters and support the preparation of gender-sensitive disaster risk management plans with community-based disaster risk reduction approach.

25 **Output 3: Energy sources provided.** This includes providing the camp areas with (i) stand-alone solar powered street lights with solar photovoltaic panels, battery boxes, and mini grid-connected street lights; and (ii) access to electricity by augmenting substations, distribution lines, and transformers.

26 **Output 4: Access roads improved.** This consists of rehabilitating (i) rural roads to connect to food storage and distribution centers, field hospitals, primary health care centers, and primary education centers; (ii) emergency access roads to the camp areas; and (iii) existing access roads to and within the camps and drainage systems. The project also supports resurfacing the road from Cox's bazar to Teknaf, which is the main supply line.

27 The project is being implemented for 2.5 years, and the grant will close by 30 June 2021. As a condition for being selected, each subproject must have an implementation period that can be completed prior to the project closing date.

1.3 PURPOSE OF THE ENVIRONMENTAL SAFEGUARDS

28 ADB environmental safeguards objectives are: (i) to ensure the environmental soundness and sustainability of projects and (ii) to support the integration of environmental considerations into the project decision-making process. ADB environmental safeguards are triggered if a project is likely to have potential environmental risks and impacts.

29 The purpose of the Environmental Safeguards for the project are defined as:

- Assist in determining adequacy of cost for EMP implementation;
- Assist in addressing any concern related to IEEs and EMPs;
- Assist in summarizing IEEs, translating to language understood by local people and disclosure in public locations;
- Oversee implementation of EMP including environmental monitoring of contractors;
- Assist in implementing corrective actions when necessary to ensure no environmental impacts;
- Review monthly reports by contractors, assist PMU to submit environmental monitoring reports on regular basis;
- Assist in establishing the grievance mechanism for safeguards and addressing any grievances brought about through the GRM in a timely manner as per IEEs;
- Submit semi-annual environmental safeguards monitoring report to ADB via PMU;
- Be responsible for training the PMU/contractor safeguards officers on environmental awareness and management in accordance with both ADB and government requirements and implement the capacity building program for PMU and all staff involved in project implementation on (a) ADB SPS, (b) Government of Bangladesh national and local environmental laws and regulations, (c) core labor standards, (d) occupational health and safety monitoring given in the environmental safeguards monitoring report and (e) EMP implementation especially spoil

- management, working in congested areas, public relations and ongoing consultations, grievance redress, etc.; and
- Provide induction course for the training of contractors preparing them on EMP implementation.

30 A location map of the proposed subproject is presented in **Figure 1**.



Figure 1 Location map of the proposed subproject

2 Environmental Responsibilities and Institutional Setup

2.1 INSTITUTIONAL SETUP AND IMPLEMENTATION ARRANGEMENTS

31 The project has been categorized as B for environment under the ADB's Safeguards Policy Statement 2009 (SPS). Individual subprojects have been screened and classified, and based on the classification, and where required, environmental assessments are undertaken and EMPs developed. Based on Schedule 1 of the ECR, subprojects are likely to require IEEs and EIAs.

32 The Refugee Relief and Repatriation Commission (RRRC) is proposed to act as the coordinator on behalf the government to execute all interventions. RRRC and ADB is conducting regular coordination meetings involving all IAs, relevant stakeholders including deputy commissioner (DC), Cox's Bazar, other development partners and agencies. ADB has established an extended mission office in Cox's Bazar for close coordination, facilitation of sub-projects development and implementation. A steering committee comprising higher officials from relevant ministries coordinated by ERD is formed to provide necessary guidance to expedite the sub-project development and implementation. The steering committee do have a safeguards focal person.

33 The Local Government Engineering Department (LGED), the Department of Public Health Engineering (DPHE), the Roads and Highways Department (RHD), and the Bangladesh Rural Electrification Board (BREB) are the executing agencies and implementing agencies responsible for project oversight and coordination. There is a safeguards focal person in the EA/IA yet to be designated. The EA/IA is assisted by PMCs. The EAs/IAs forms project implementation units (PIU). The PIUs identifies a focal person for environmental safeguards. The focal person is assisted in the conduct of the environmental assessment, the development and implementation of EMPs, and compliance monitoring by project consultants. All the implementing agencies are currently implementing ADB projects under this institutional arrangement. ADB also conducts safeguards training for project executing and implementing agencies. Thus, the government has sufficient capacity in implementing ADB requirements and strengthening of capacity, other than through the course of the consultant's work with local counterparts, is not required. ADB continues to conduct capacity building programs during implementation.

34 The Project Organization established to ensure the requirements of all stakeholders are adequately addressed is shown in the following diagram (**Figure 2**).

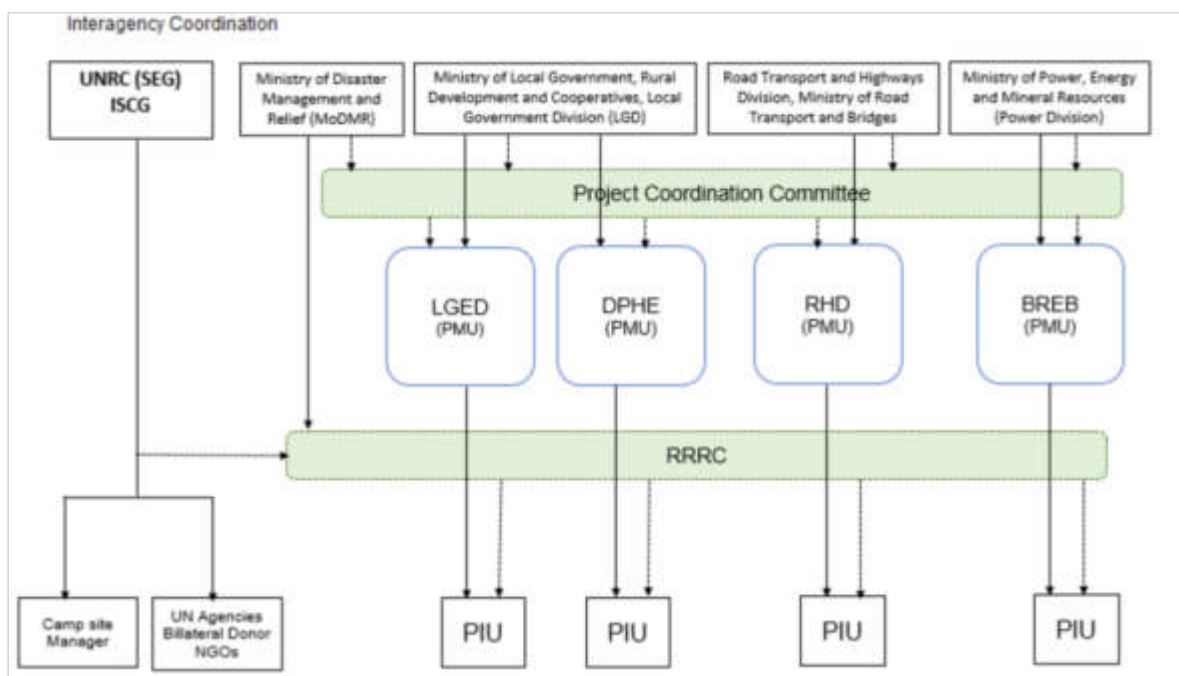


Figure 2 Project organization structure

2.2 RESPONSIBILITIES: ENVIRONMENTAL SAFEGUARDS

35 In compliance with ADB's Safeguard Policy Statement (2009), the project's safeguard categories are as follows:

36 **Environment (category B):** ADB formed subproject selection criteria to avoid significant adverse environmental impacts. An environmental assessment and review framework (EARF) has been prepared following ADB's Safeguards Policy Statement (2009) and government laws and regulations. ADB has disclosed the EARF on its website. Implementation arrangements build on the implementing agencies' experience from other ADB-financed projects, and the project team is helping the implementing agencies gain adequate capacity to manage environmental impacts through consultant support. Initial environmental examinations and environmental management plans are being prepared consistent with the EARF and incorporated in bidding documents and contract documents to be implemented by contractors and monitored by the implementing agencies. Executing and/or implementing agencies are providing environmental report to the Bangladesh Resident Mission on a semiannual basis.

37 **Involuntary resettlement (category B):** ADB formed subproject selection criteria to avoid land acquisition and involuntary resettlement impacts and social risks. A resettlement framework has been prepared and disclosed, following ADB's Safeguards Policy Statement and government laws and regulations, to guide planning studies and detailed designs of subprojects. The project team helps the implementing agencies gain adequate capacity to prepare resettlement plans, if required, through consultant support. Consultations have been undertaken with stakeholders in project areas during implementation. Executing and/or implementing agencies are providing resettlement implementation report to the Bangladesh Resident Mission on a semiannual basis.

2.3 ENVIRONMENTAL CRITERIA FOR SUBPROJECT SELECTION

38 Subprojects selected should not have significant environmental impacts. Environmental guidelines for subproject selection in Table 1 provide further guidance to avoid or minimize adverse impacts during the identification and finalization of subprojects.

Table 1 Environmental Guideline for new subproject

Component	Environmental Guidelines for Subproject Selection
Overall (Applicable to all Subprojects)	Comply with all applicable national and local laws, regulations, and standards.
	Comply with ADB's SPS.
	Avoid land acquisition and involuntary resettlement and have no impacts on indigenous peoples.
	Avoid protected areas and areas of historical/cultural value.
	Avoid building or setting-up construction camp sites along elephant migration routes
Transport Infrastructure	Do not build new* roads and avoid widening existing roads, as much as possible.
	Avoid hill cutting.
	Do not build new* bridges.
	Avoid cutting trees on the roadside and if any trees have to be removed, plant two new trees for every tree lost.
	Consult the relevant archaeological agency regarding archaeological potential subproject areas to ensure that these are located in areas where there is a low risk of chance finds.

3 Monitoring Framework and Environmental Compliance

3.1 MONITORING FRAMEWORK

Impact the Project is Aligned with Social recovery of displaced persons in Teknaf and Ukhia camps accelerated (Defined by the project)			
Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
Outcome Living conditions and resilience of displaced persons improved	By 2021 a. Reported cases of waterborne diseases decreased by 20%. b. Occurrence of landslides and flooding in project area during average monsoon months reduced by 50%. c. At least 90% of households in project area connected to electricity. d. Average travel time to transport relief goods and services to campsites reduced by 50%.	a. Project beneficiary survey, executing agency reports	Crisis and influx of displaced persons extend beyond the project life and exceed projected demand for services.
Outputs 1. Water supply and sanitation improved	By 2020 1a. 5 mobile water carriers for the distribution of potable water to the camps provided (2018 baseline: 0) 1b. 600 community bathing facilities for women constructed and maintained, of which 10%–20% of women are employed and involved (2018 baseline: 0) 1c. 40 mini piped water supply systems with production tube wells constructed (2018 baseline: 0) 1d. 5 integrated waste management facilities constructed, and a collection system established (2018 baseline: 0) 1e. 2 small surface water treatment plants constructed or expanded (2018 baseline: 0)	1a–e. Periodic project progress reports prepared by the executing agency	Extreme climate events disrupt or delay execution of works.

2. Disaster risk management strengthened	<p>2a. 10 multipurpose cyclone shelters constructed with sex- disaggregated toilets and designated space for women, including pregnant women and lactating mothers (2018 baseline: 0)</p> <p>2b. 20 semi-permanent food distribution centers constructed and employed 10%–20% of women in the community (2018 baseline: 0)</p> <p>2c. 5 km of hill slope protection and/or toe walls constructed (2018 baseline: 0)</p> <p>2d. 5 km storm water drainage network constructed (2018 baseline: 0)</p> <p>2e. 200 lightning arresters installed (2018 baseline: 0)</p> <p>2f. Gender-sensitive disaster risk management plans, adopting community-based disaster risk reduction approach, prepared and implemented (2018 baseline: not applicable)</p>	2a–f. Periodic project progress reports prepared by the executing agency
3. Energy sources provided	<p>3a. A 33/11 kV, 10 MVA substation constructed; and Cox's bazar-Teknaf grid augmented</p> <p>3b. A 50 km, ≤11 kV new distribution line constructed with 5 MVA distribution transformers installed (2018 baseline: 0)</p> <p>3c. 2,000 new mini grid-connected street lights and 4,000 new stand- alone solar LED lights with built-in solar PV panels and battery banks installed (2018 baseline: 62 grid-connected street lights and 2,495 solar PV street lights inside the camps)</p> <p>3d. 70,000 retained heat cookers provided (2018 baseline: 0)</p> <p>3e. 50 solar PV micro-grid systems installed at Balukhali, Kutupalong, Noyapara, Leda, and Shamlapur camps (2018 baseline: 0)</p>	3a–e. Periodic project progress reports prepared by the executing agency
4. Access roads improved	<p>4a. 30 km of internal roads and stairs (where required) with drainage facilities constructed (2018 baseline: 0)</p> <p>4b. 30 km of rural roads to connect to food storage centers, food distribution centers, field hospitals, primary health care centers, cyclone shelters, and primary education centers reconstructed and rehabilitated (2018 baseline: 0)</p> <p>4c. 50 km of the road from Coxsbazar to Teknaf resurfaced, including the improvement of critical sections (market areas and culverts) (2018 baseline: 0)</p> <p>4d. 10%–20% of women employment in the construction and rehabilitation of access roads achieved (2018 baseline: 0)</p>	4a–d. Periodic project progress reports prepared by the executing agency

Key Activities with Milestones

1. Water supply and sanitation improved

- 1.1 Identify and appraise subprojects, as required (by Q3 2018)
- 1.2 Recruit consultants (by Q3 2018)
- 1.3 Prepare bid documents and commence bidding (by Q3 2018)
- 2. Disaster risk management strengthened
- 2.1 Identify and appraise subprojects, as required (by Q3 2018)
- 2.2 Recruit consultants (by Q3 2018)
- 2.3 Prepare bid documents and commence bidding (by Q3 2018)
- 2.4 Complete disaster risk capacity building for implementing agencies and key stakeholders (Q4 2018)
- 3. Energy sources provided
- 3.1 Identify and appraise subprojects, as required (by Q3 2018)
- 3.2 Recruit consultants (by Q3 2018)
- 3.3 Prepare bid documents and commence bidding (by Q3 2018)
- 4. Access roads improved
- 4.1 Identify and appraise subprojects, as required (by Q3 2018)
- 4.2 Recruit consultants (by Q4 2018)
- 4.3 Prepare bid documents and commence bidding (by Q3 2018)

3.2 COMPLIANCE WITH ENVIRONMENTAL RELATED PROJECT COVENANTS

3.2.1 National Covenant

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

40 The main Ministry, Department, Institutions and Boards responsible for development of policy, framing regulation, developing projects, monitoring and approval of issues related to environment protection and conservation are presented in this section. The Department of Environment (DoE) was established in 1977 under the Environment Pollution Control Ordinance, 1977. During 1987-89, Forestry was a Division of Agriculture Ministry with a Secretary to Government in charge of the Forestry Division. With the formation of the new Ministry of Environment and Forests, in 1989, both the departments were transferred to this new Ministry.

41 The DoE has been placed under the MoEFCC as its technical wing and is statutorily responsible for the implementation of the Environment Conservation Act, 1995. Besides these two departments, MoEFCC controls the Bangladesh Forest Industries Development Corporation (BFIDC), Bangladesh Forest Research Institute (BFRI) and Bangladesh National Herbarium (BNH).

42 The Ministry of Environment and Forests and Climate Change (MoEFCC) prepare the environmental policies. MoEFCC has also formulated regulation toward clearance of projects from environmental angles based on environmental impact assessment report.

43 The Department of Environment is responsible for environmental issues while forest issues are looked after Department of Forests. Over the years, the MoEFCC has adopted number of legal instrument in the form of Acts for the protection and conservation of the environment. **Table 2** summarizes the Environmental Legislation applicable to the sub-projects.

Table 2 Summary of Environmental Legislations Applicable to the Proposed Project

No.	Environmental Legislation / Act	Objective	Relevance to the Project	Responsible Institution
1	National Environmental Policy, 1992	Ensure that development components do not pollute the environment or degrade resources. It sets out the basic framework for environmental action together with a set of broad sectoral action guidelines.	Restriction on operations which cannot be initiated in ecological critical areas Regulation on vehicles emitting smoke which is harmful to the environment Follow standards on quality of air, water, noise and soil Sets limits for discharging and emitting waste	Ministry of Environment and Forests, and Climate Change
2	National Environmental Management Action Plan (NEMAP), 1995	An action plan to identify key environmental issues affecting Bangladesh, identifies actions for reducing the rate of environmental degradation and improve quality of life.	Sectoral agencies to coordinate with MoEFCC in preparing environmental guidelines	Ministry of Environment and Forests, and Climate Change
3	Environment Court Act, 2000 and subsequent amendments in 2003	Establishment of Environment Court for trial of an offence or for compensation under environmental law, such as environment pollution.	Option to affected persons for grievances related to environment safeguards.	Ministry of Environment and Forests, and Climate Change
4	The Forest Act (1927) and Forest (Amendment) Act (2000)	An act to control trespassing, illegal resource extraction and provide a framework for the forestry revenue collection system;	Requires clearances for any project within forest areas and clearances for any felling, extraction, and transport of forest produce.	Department of Forests
5	National Forest Policy (1994)	To conserve existing forests and bring about 20% of the country's land area under the Forestation Programme and increase reserved forests by 10% per year until 2015	Incorporate tree planting in the subproject Clearance for any felling, extraction, and transport of forest produce	Department of Forests
6	The Bangladesh Wildlife (Conservation & Security) Act, 2012	To conserve and protect wildlife in Bangladesh including designation of protected areas. Protection of wildlife is provided with lists of species with four schedules: first, second, third and fourth schedule. The fourth schedule species have the highest level of protection.	Consultation and necessary permits required if the project will pass through the wildlife sanctuaries and other protected areas.	Department of Forests
7	National Safe Drinking Water Supply and Sanitation Policy of 1998	Ensures access to safe water and sanitation services at an affordable cost	Pourashavas and water sanitation authorities will take actions to prevent wastage of water. They will take necessary steps to increase public awareness to prevent misuse of water Pourashavas shall be responsible for solid waste collection, disposal and their management	Ministry of Local Government, Rural Development, and Cooperatives

No.	Environmental Legislation / Act	Objective	Relevance to the Project	Responsible Institution
8	National Water Act 2013	Ensures Bangladesh water sources are free from any type of pollution. Pollution from water in urban outfalls and reservoirs, e.g. lakes, canals, ponds and ditches may result in amenity losses, fisheries depletion, health problems and fish and aquatic species contamination.	Secure clearance certificate on water resource development subprojects	Ministry of Water Resources
9	Wetland Protection Act 2000	Advocates protection against degradation and resuscitation of natural water-bodies such as lakes, ponds, beels ¹ , khals, tanks, etc. affected by man-made interventions or other causes. Prevents the filling of publicly-owned water bodies and depressions in urban areas for preservation of the natural aquifers and environment. Prevents unplanned construction on riverbanks and indiscriminate clearance of vegetation on newly accreted land.	In case of diversion of water from Naf river, detailed assessment will be done	Ministry of Water Resources
10	Bangladesh Labor Law, 2006	It is a comprehensive law covering labour issues such as: conditions of service and employment, youth employment, benefits including maternal benefits, compensation for injuries, trade unions and industrial relations, disputes, participation of workers in company's profits, regulation of safety of dock workers, penalty procedures, administration and inspection. This Act pertains to the occupational rights and safety of factory workers and the provision of a comfortable environment for working. It also includes rules on registration of labourers, misconduct rules, income and benefits, health and fire safety, factory plan	Compliance to provisions on employment standards, occupational health and safety, welfare and social protection, labor relations and social dialogue, and enforcement. Prohibition of employment of children and adolescents.	Ministry of Labor and Employment
11	Bangladesh Labor Rules, 2015	Includes rules on registration of laborers, misconduct rules, income and benefits, health and fire safety, factory plan	Contractors to implement occupational health and safety measures Contractor will be liable for compensation for work-related injuries	Department of Labor
12	The Pourashava Act 2009 / Ordinance issued for the amendment of local government (municipality) ordinance, 2009 and 2010; The Pourashava Ordinance, 1977;	Provides guidance for subproject integrated community and workers health and hygiene at the construction and operation and maintenance stages of the project	Coordinate with pourashava committees on disaster management measures, water and sanitation and waste management	Local Authorities

¹ A beel is a billabong or a lake-like wetland with static water (as opposed to moving water in rivers and canals - typically called khaals), in the Ganges - Brahmaputra flood plains of the Eastern Indian states of West Bengal, and Assam and in the country of Bangladesh.

No.	Environmental Legislation / Act	Objective	Relevance to the Project	Responsible Institution
	Municipal Administration Ordinance, 1960			
13	Bangladesh Climate Change Strategy and Action Plan of 2009	Enhances the capacity of government ministries, civil society and private sector to meet the challenges of climate change	Integrate adaptation measures for buildings in consideration of extreme climatic events	Ministry of Environment, Forests and Climate Change
14	Building Construction (Amendment) Act and Building Construction Rules, Bangladesh National Building Code	Regulates technical details of building construction and to maintain standards of building construction	Follow specifications to ensure structural integrity of buildings	Ministry of Housing and Public Works
15	Electricity Act, 1910 and Electricity Rules 1937	Requires compensation for any damage, detriment or inconvenience caused by the project; Requires precautionary measures in laying down electricity supply lines near or where any metallic substance or line crosses to avoid electrocution	Secure permission to supply energy and lay down or place electricity supply lines for the conveyance and transmission of electricity from respective authorities prior to any works Give full compensation for any damage, detriment or inconvenience caused by him or by anyone employed by him Take precautions in laying down electricity supply lines near or where any metallic substance or line crosses in order to avoid electrocution	Ministry of Power, Energy and Mineral Resources
16	The National Energy Policy (1996 and Updated 2004)	Ensures environmentally sound sustainable energy development programs causing minimum damage to the environment, to encourage public and private sector participation in the development and management of the energy sector and to bring the entire country under electrification.	Public and private sector participation in the development and management of the energy subprojects. Provides guidelines for renewable energy subprojects	Ministry of Power, Energy and Mineral Resources
17	Standing Order on Disaster, 1999 (Updated 2010)	Enhances capacity at all tiers of government administrative and social structures for coping with and recovering from disasters	Geographical information system (GIS) technology will be applied at the planning stage to select location of cyclone shelter considering habitation, communication facilities, distance from the nearest cyclone center, etc Advice from the concerned District Committee should be obtained prior to final decision	Ministry of Disaster Management and Relief
18	National Disaster Management Act of 2012	Establishes a framework for managing disasters in a comprehensive way.	Setting-up emergency response procedures	Ministry of Disaster and Relief

3.2.2 ADB Safeguards Policy Statement

44 The important elements of ADB's resettlement policy statement (APS 2009) include the following:

- i. Compensation to replace lost assets, livelihood, and income;
- ii. Assistance for relocation, including provision of relocation sites with appropriate facilities and services; and
- iii. Assistance for rehabilitation to achieve at least the same level of well-being with the project as without it.

45 For any ADB operation requiring involuntary resettlement, resettlement planning is an integral part of project design, to be dealt with from the earliest stages of the project cycle, taking into account the following basic principles:

- i. Involuntary resettlement will be avoided whenever feasible.
- ii. Where population displacement is unavoidable, it should be minimized.
- iii. All lost assets acquired or affected will be compensated. Compensation is based on the principle of replacement cost.
- iv. Each involuntary resettlement is conceived and executed as part of a development project or program. Affected persons need to be provided with sufficient resources to re-establish their livelihoods and homes with time-bound action in co-ordination with civil works.
- v. Affected persons are to be fully informed and closely consulted.
- vi. Affected persons are to be assisted to integrate economically and socially into host communities so that adverse impacts on the host communities are minimized and social harmony is promoted.
- vii. The absence of a formal title to land is not a bar to ADB policy entitlements.
- viii. Affected persons are to be identified and recorded as early as possible to establish their eligibility, through a census which serves as a cut-off date, and prevents subsequent influx of encroachers.
- ix. Particular attention will be paid to vulnerable groups including those without legal title to land or other assets; households headed by women; the elderly or disabled; and indigenous groups. Assistance must be provided to help them improve their socio-economic status.
- x. The full resettlement costs will be included in the presentation of project costs and benefits.

3.2.3 SPS, 2009 compliance status

46 Refer to **Table 3** for the status of the respective component sub-projects with regard to compliance status to ADB's policy statement (APS 2009).

Table 3 ADB Safeguards Policy compliance Status for the EAP subprojects

ADB Safeguard Policy Statement	Contract Package Status				
	Cyclone Shelter Sub-project	Road Sub-project	Drainage/erosion Sub-project	Water Supply Sub-project	Others Sub-project
(i) Involuntary resettlement will be avoided whenever feasible.	complied	complied	complied	complied	complied
(ii) Where population displacement is unavoidable, it should be	No displacement	No displacement	No displacement	No displacement	No displacement

ADB Safeguard Policy Statement	Contract Package Status				
	Cyclone Shelter Sub-project	Road Sub-project	Drainage/erosion Sub-project	Water Supply Sub-project	Others Sub-project
minimized.					
(iii) All lost assets acquired or affected will be compensated. Compensation is based on the principle of replacement cost.	NA	Matrix formulated	Matrix formulated	NA	NA
(iv) Each involuntary resettlement is conceived and executed as part of a development project or program. Affected persons need to be provided with sufficient resources to re-establish their livelihoods and homes with time-bound action in co-ordination with civil works.	NA	Provided in Compensation Matrix	Provided in Compensation Matrix	NA	NA
(v) Affected persons are to be fully informed and closely consulted.	complied	complied	complied	complied	complied
(vi) Affected persons are to be assisted to integrate economically and socially into host communities so that adverse impacts on the host communities are minimized and social harmony is promoted.	NA	NA	NA	NA	NA
(vii) The absence of a formal title to land is not a bar to ADB policy entitlements.	NA	NA	NA	NA	NA
(viii) Affected persons are to be identified and recorded as early as possible to establish their eligibility, through a census, which serves as a cut-off date, and prevents subsequent influx of encroachers.	NA	complied	complied	NA	NA
(ix) Particular attention will be paid to vulnerable groups including those without legal title to land or other assets; households headed by women; the elderly or disabled; and indigenous groups. Assistance must be provided to help them improve their socio-economic status.	NA	complied	complied	NA	NA
(x) The full resettlement costs will be included in the presentation of project costs and benefits.	NA	NA	NA	NA	NA

3.2.4 Compliance with Grant Covenants

47 Schedule 5 of the Agreements for Grant 0582-BAN includes covenants for environmental issues. The Project's compliance with the contractual environmental safeguards covenants are shown in the **Table 4**.

Table 4 Compliance with Environmental Considerations of Grant Agreements

Covenant	Reference in the Grant Agreement	Compliance Status
Environment Safeguards		
The Recipient shall ensure, or cause the EAs to ensure, that the preparation, design, construction, implementation, operation and decommissioning of each Subproject comply with:	Schedule 5, Para. 8	Complied.
(a) all applicable laws and regulations of the Recipient relating to environment, health, and safety;		All requirements addressed in preparation and design stages including contract documentation.
(b) the Environmental Safeguards;		
(c) the EARF; and		
(d) all measures and requirements set forth in the respective IEE and EMP, and any corrective or preventative actions set forth in a Safeguards Monitoring Report.		
Safeguards – Related Provisions in Bidding Documents and Works Contracts		
The Recipient shall ensure, or cause the EAs to ensure, that all bidding documents and contracts for Works contain provisions that require contractors to:	Schedule 5, Para. 13	Complied.
(a) comply with the measures and requirements relevant to the contractor set forth in the relevant IEE, EMP and RP (to the extent they concern impacts on affected people during construction), and any corrective or preventative actions set out in a Safeguards Monitoring Report;		Complied. All Bidding Documents and Contracts contain the required provisions
(b) make available a budget for all such environmental and social measures;		Complied.
(c) provide the Recipient with a written notice of any unanticipated environmental, resettlement or indigenous peoples risks or impacts that arise during construction, implementation or operation of the Subproject that were not considered in the relevant IEE, EMP and RP;		Complied.
(d) adequately record the condition of roads, agricultural land and other infrastructure prior to starting to transport materials and construction.		Complied.
Safeguards Monitoring and Reporting		
The Recipient shall do the following, or shall cause the EAs to do the following:	Schedule 5, Para. 14	Complied.
(a) submit semi-annual Safeguards Monitoring Reports to ADB and disclose relevant information from such reports to affected persons promptly upon submission.		

3.2.5 Compliance Status with ADB' Review Mission

48 The Asian Development Bank (ADB), Bangladesh Resident Mission (BRM) fielded a Mid-term Review Mission from 16 to 26 June 2019 for Emergency Assistance Project (EAP). The MTR mission reviewed the overall environmental management system adopted in the EAP. The mission visited several

completed, ongoing and planned activities and reviewed the implementation and compliances of EMP of several subprojects, recommended corrective actions plan (CAP) for ensuring compliances of EMP implementation. Status of implementation of CAP is provided in **Table 5**.

Table 5 Status of implementation of Corrective Action Plan

Recommended Corrective Action Measures	Responsibility	Implementation Status
Share the design of Surface Water Treatment Plant (Package- EAP/DPHE/W12B) with the TA consultant (environmental Specialist) immediately so that IEE can be prepared accordingly.	DPHE	Partially complied. Indicative IEE is done based on preliminary design which will be finalized after having detail design of SWTP, transmission and distribution network which is now underway.
Contractor should prepare site specific EMP and submit to ADB for pipe water supply system at Unchiprang under DPHE.	Contractor	Partially complied. Contractor just mobilized to the site and agreed to submit the SEMP as early as possible.
PMU to take necessary action to stop wastewater discharge to the cultivated land from the site (Palongkhali substation).	Contractor	Complied.
Move the construction materials from the school building/ do not use the school as labor shed (School: Nhila Burmese Government Primary School)	Contractor	Not complied. Contractor failed to relocate construction materials and labor shed from school building which to be shifted to designated location.
Finalize the design of access road (EAP/LGED/W5) and immediately share with the TA consultant (environmental Specialist) so that EMP and IEE can be prepared accordingly.	LGED	Complied. IEE is done and disclosed.
Quarterly environmental monitoring report to be prepared by the contractor as per the agreement and share the report with ADB TA Safeguards consultant. (Cox's Bazar-Ukhiya Highway package)	Contractor	Partially complied. Environmental monitoring report has been submitted without quantitative monitoring data by DMS.
To improve the Health & Safety condition of the site, contractor should use the ADB recommended checklist (to be shared by ADB TA consultant) on weekly basis.	LGED/BREB/ DPHE/RHD	Partially complied. The checklist is shared with PMU to circulate among the Contractors and few of them (RHD and DPHE) submitted the checklist on monthly basis.

3.3 GRIEVANCE REDRESS MECHANISM

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

50 During implementation of the project, a grievance redress committee (GRC) is essentially required to be formed at the Upazila level to District / National level by following by the approved Environmental Assessment and Review Framework (EARF) which will be done through discussion at all the respective

levels of the Executive Agencies (LGED, DPHE, RHD and BREB). The grievance redress mechanism and procedure as per EARF are depicted in the following **Figure 3**.

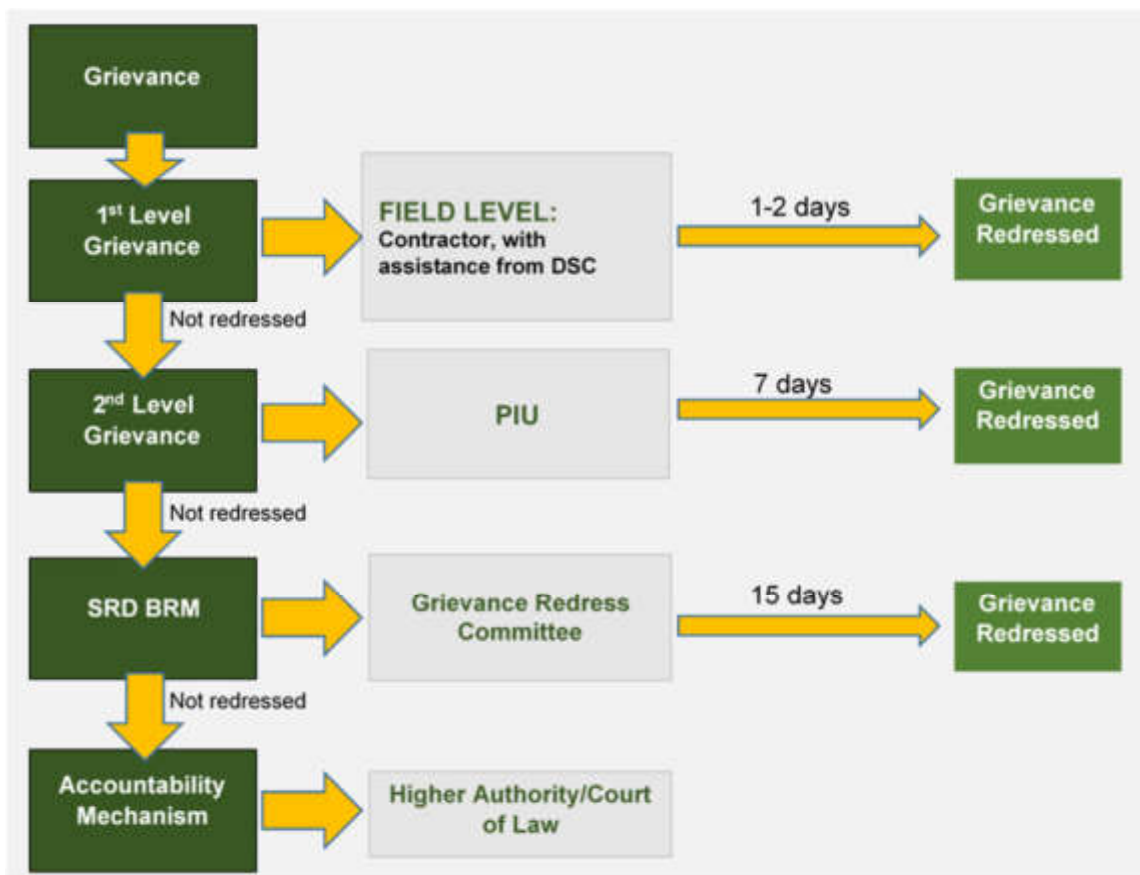


Figure 3 Grievance Redress Mechanism

51 GRM is yet to be formed. All the respective Executive Agencies are required to form GRM at the sub-projects level in which any affected persons can express grievances to resolve it through a transparent process. In this regard, ADB Environmental Consultant accompanied by Social Safeguard Consultant of ADB conducted several meetings with the representative of EAs in Cox's Bazar.

4 Status of Ongoing Contract Packages

4.1 PROJECT STATUS

53 To date 51 sub-projects have been finalized, instead of 60 sub-projects preliminarily identified in 2018. Of them BREB is implementing 9 subprojects, DPHE is carrying out 21 subprojects, LGED is executing 18 subprojects and RHD is implementing 3 subprojects. Of these subprojects 32 subprojects are identified as Category B according to ADB classification.

54 According to the ADP policy on environment, all the B category subprojects would require EMP and IEE reports before project implementation to ensure that the projects will be environmental viable and all the environmental laws, rules, restriction and policies of ADB and GoB are attained.

55 To date, 44 sub-projects have been awarded, 5 is at IFB and 2 is at bid preparation stage. However, out of 44 awarded subprojects 9 packages have already been completed. The summary status of the subprojects is given in **Table 6**.

Table 6 Sub-project progress status of EAP (information up to 30 June 2020)

Executive Agency	Total Package	Contact awarded (completed)	Invitation for Bid	Bid preparation stage	Financial Progress
BREB	09	09 (3)	0	0	93%
DPHE	21	17 (5)	2	2	47%
LGED	18	15 (1)	3	0	73%
RHD	03	03 (0)	0	0	97%
Total	51	44 (9)	5	2	70%

56 A comparative analysis of contract awards in the first six month (July- December 2018), second six-month (January – June 2019), third six-month (July – December 2019) and fourth six-month (January- June 2020) has been given in Table 7. In the fourth six-month 18 contracts were awarded while in the first, second and third six-month 7, 15 and 4 contracts were awarded respectively.

Table 7 Comparative analysis of contract awards in first, second, third and fourth six month

Executive Agency	Total Package	1st six month (2018)	2nd six month (2019)	3rd six month (2019)	4th six month (2020)	Total Contract awarded
BREB	09	4	1	1	3	09
DPHE	21	1	8	1	7	17
LGED	18	0	5	2	8	15
RHD	03	2	1	0	0	03
Total	51	7	15	4	18	44

57 The list of sub-projects that have been awarded to date are presented in **Table 8**.

Table 8 List of subprojects been awarded to date and their progress status

SL no.	Component	Package No.	Description	Progress to date
BREB				
1	Disaster Risk management	EAP/BREB/G1	Supply and installation of 200 nos. lightning arresters along the access roads	a) All 200 lightning arresters completed b) Progress 100%

SL no.	Component	Package No.	Description	Progress to date
			from Palongkhali to Kutupalong camp, and all other camps.	
2	Energy	EAP/BREB/G2A	Supply, installation and Operation & Maintenance of 2,000 Nos. Solar PV Powered LED Street Lights	a) All 2,000 street lights completed; b) Progress 100%
3	Energy	EAP/BREB/G2B	Supply and installation of 2,000 nos. solar powered 20-watt LED street lights, in all camps	a) All 2,000 street lights completed; b) Progress 100%
4	Energy	EAP/BREB/G5	Supply, Installation Testing commissioning of 50 nos. solar nano-grid for household electricity supply within the camp (150 household per cluster: to cater 7,500 HH) at Balukhali mega camp	Completed works: Battery room = 40 nos. Solar installation = 14 nos. and pole erection = 950 nos. Ongoing sites = 9 nos. Overall physical progress is 75%.
5	Energy	EAP/BREB/W1A	Design, Supply, Installation, Testing & Commissioning of 33/11kV, 10/14MVA Electrical Sub-station (Turn-key)	Progress 100%. The system is functioning appropriately.
6	Energy	EAP/BREB/W2	Design, Supply and Construction of 50 KM, 11KV and Below Lines in the Camp Areas of Displaced Personnel and Other Areas at Ukhiya and Teknaf (Turnkey)	Completed works: Poles installed = 1130 nos, Conductor installation = 43km, Transformer installed = 50 nos (out of 100), Fittings completed: 95%. Total line completed = 43km. Overall physical progress is 90%.
7	Energy	EAP/BREB/G6A	Supply, installation, Operation & Maintenance of 25 Nos. Solar PV Nano Grid for Household electricity.	22 sites have been received from IOM. Overall physical progress is 10%.
8	Energy	EAP/BREB/G6B	Supply, installation, Operation & Maintenance of 25 Nos. Solar PV Nano Grid for Household electricity	15 sites have been received from UNHCR. Overall physical progress is 10%.
9	Disaster Risk management	EAP/BREB/G7	Supply and installation of 200 lightning arrestors along the access roads within the camps	50% physical progress has been achieved to date.
DPHE				
10	Water and Sanitation	EAP/DPHE/G1	Supply of 7 no. Water Carriers for Emergency Water supply including operation and maintenance for 2 years in Cox's Bazar, Ukhiya and Teknaf	100% physical progress achieved. Handover completed.
11	Water and Sanitation	EAP/DPHE/G4	Supply and operation of 4 no. drilling rigs	Supply of equipment in process and expected completion by July 2020. Overall progress is 80%.
12	Water and Sanitation	EAP/DPHE/W1	Construction and operation of mini piped water	95% physical progress has been achieved to date.
13	Water and Sanitation	EAP/DPHE/W2	Construction and operation of mini piped water supply system (10 schemes): Package 2	Progress 100%. Hand over completed.
14	Water and Sanitation	EAP/DPHE/W3	Construction and operation of mini piped water supply system (10 schemes): Package 3	85% physical progress has been achieved up to date.
15	Water and Sanitation	EAP/DPHE/W4	Construction and operation of mini piped water supply system (10 schemes): Package 4	70% physical progress has been achieved up to date.
16	Water and Sanitation	EAP/DPHE/W5	Construction and operation of mini piped water supply system (5 schemes): Package 5	80% physical progress has been achieved up to date.
17	Water and Sanitation	EAP/DPHE/W9A	Construction and operation of 2 Integrated waste management and resource recovery facilities with collection system at the outskirts of Kutupalong Balukhali Megacamp, Ukhiya Group-2	Lot - 2: 100% progress has been achieved to date. Implementation work of Lot-1 is ongoing.

SL no.	Component	Package No.	Description	Progress to date
18	Water and Sanitation	EAP/DPHE/W9B	Construction and operation of Integrated waste management (Kutupalong Balukhali) Group-3	50% physical progress has been achieved to date.
19	Water and Sanitation	EAP/DPHE/W10	Construction and operation of Integrated waste management system (Shamlapur, Teknaf) Group -1	50% physical progress has been achieved to date.
20	Water and Sanitation	EAP/DPHE/W11	Construction of Surface Water Treatment Plant for supporting water supply at Cox's Bazar city and surrounding areas	Lot 1: Contract signed on 29 June 2020. Contractor is advised to mobilize to the site. Lot 2: Contract signed on 30 June 2020. Contractor is advised to mobilize to the site. Lot 3: Contract is expected to be signed by 25 July 2020. Lot 4: Contract signed on 29 June 2020. Contractor is advised to mobilize to the site. Lot 5: Contract is expected to be signed by 25 July 2020.
21	Water and sanitation	EAP/DPHE/W12A	Construction of surface water reservoir based piped water system (Nayapara, Teknaf)	Lot 1: Contract signed on 18 June 2020. Contractor is advised to mobilize to the site. Lot 2: Contract is expected to be signed by 15 July 2020.
22	Water and Sanitation	EAP/DPHE/W12B	Construction of piped water systems (Unchiprang/ Shamlapur)	10% physical progress has been achieved to date.
23	Water and Sanitation	EAP/DPHE/W13	Construction of Community Bathing Facilities (100 units), Group -1	Progress 100%. Handover completed.
24	Water and Sanitation	EAP/DPHE/W14	Construction of Community Bathing Facilities (200 units), Group -2	Progress 100%. Handover completed.
25	Water and Sanitation	EAP/DPHE/W15	Construction of Community Bathing Facilities (200 units), Group -3	Progress 100%. Handover completed.
26	Water and Sanitation	EAP/DPHE/CON/1	Design, Monitoring and Supervision consulting services of DPHE component, Cox's Bazar	Consultants fielded as per TOR.
LGED				
27	Roads	EAP/LGED/ OCB-N/W1A	Construction of 7.5 km Internal Roads and Stairs with Drainage Facilities Inside the camps in Ukhiya, Group 1	Contract signed on 4 June 2020. Contractor is instructed to mobilize to the site.
28	Roads	EAP/LGED/ OCB-N/W1B	Construction of 7.5 km Internal Roads and Stairs with Drainage Facilities Inside the camps. in Ukhiya, Group 2	20% physical progress has been achieved to date.
29	Roads	EAP/LGED/ OCB-N/W3	Improvement of 1.5 km existing Folia Para road connecting Highway to U-B Road Ukhiya+ Upgradation of 5.5 km existing N.I. Chowdhury Road Connecting Marine Drive to U-B road.	40% physical progress has been achieved to date.
30	Roads	EAP/LGED/ OCB-N/W5	Upgradation of existing 8.8 km link road connecting Cox's Bazar-Teknaf and Marine Drive Highways, Ukhiya	33% physical progress has been achieved to date.
31	Disaster Risk Management	EAP/LGED/OCB-N/W6	Construction of 4 nos. school cum cyclone shelter for affected people, 3 story LGED Prototype, in Ukhiya	54.75% physical progress has been achieved up to date.
32	Disaster Risk Management	EAP/LGED/OCB-N/W8	Construction of 3 nos. school cum cyclone shelter for affected people, 3 story LGED Prototype, in Ukhiya	69% physical progress has been achieved up to date.
33	Disaster Risk Management	EAP/LGED/OCB-N/W9	Construction of 3 nos. School cum cyclone shelter for affected people, 3 story LGED Prototype, in Teknaf	59% physical progress has been achieved up to date.
34	Disaster Risk Management	EAP/LGED/OCB-N/W10	Construction of Hill Slope Protection inside the Kutupalong Balukhali Mega Camp at Ukhiya	Contract signed on 18 June 2020. Contractor is instructed to mobilize to the site.

SL no.	Component	Package No.	Description	Progress to date
35	Roads	EAP/LGED/ OCB-N/W4C	Improvement of Hajirpara Mukter Swdagor bari Side-Dakhin Faliapara Sajahan bari Rd. Ch. 00-2400 m, Malercul LGED Road-Dakhin Faliapara Rd. Ch. 00-814 m & Ali Mohammed Pingir Rd. Ch. 00-2327 m by BC, under Ukhia Upazila, Dist: Cox's Bazar	15% physical progress has been achieved to date.
36	Roads	EAP/LGED/ OCB-N/W4D	Improvement of Ratnapalong UP office Coat Bazar – Valukhiya Bazar Road by BC at Ch. 00-4300m & Ratnapalong UP Office – Chakbaita Bazar via Goyalmara Road by BC at Ch. 00-4435m under Ukhia Upazila, Dist: Cox's Bazar	6% physical progress has been achieved to date.
37	Disaster Risk Management	EAP/LGED/OCB-N/W6A	Construction of Boundary wall of 7 nos. Multipurpose Cyclone Shelters at Ukhia Upazila and 3 nos. Multipurpose Cyclone Shelters at Teknaf Upazila in Cox's Bazar	Contract signed on 2 June 2020. Contractor is instructed to mobilize to the site.
38	Disaster Risk Management	EAP/LGED/OCB-N/W19	Construction of Semi-Permanent Food Distribution Centers and loading /unloading yard in Ukhia and Teknaf	100% complete. All 4 FDCs handed over.
39	Disaster Risk Management	EAP/LGED/OCB-N/W20	Construction of Storm Water Drainage Network inside camps and evacuating water outside camps, 2 groups in Ukhia	53% physical progress has been achieved to date.
40	Disaster Risk Management	EAP/LGED/OCB-N/W21	Construction of Storm Water Drainage Network inside camps and evacuating water outside camps: 1 group in Teknaf	29% physical progress has been achieved to date.
41	Disaster Risk Management	EAP/LGED/CON/1	Design, Monitoring and Supervision consulting services through ICT for LGED component, Cox's Bazar	Consultant fielded as per TOR.
RHD				
42	Roads	EAP/RHD/W1	Rehabilitation of National Highway from LinkRoad (Cox's Bazar) (Chainage 381+494) to Ukhia (Chainage- 406+494)	<ul style="list-style-type: none"> • Pavement for widening (sub-base) 23 km (100%) completed • Pavement for widening (ISG) 23 km (100%) completed • Box cutting 23 km (100%) completed • 6 out of 10 culverts completed • One km (100%) Toe Wall (100%) completed • 3.5 km out of 6.5 km "U"-shaped drain completed
43	Roads	EAP/RHD/W2	Rehabilitation of National Highway from Ukhia (Chainage 406+494) to Unchiprang (Chainage-431+494)	<ul style="list-style-type: none"> • 16.75 km out of 21 km pavement for widening (sub-base) completed • 16.75 km out of 21 km pavement of widening (ISG) completed • 16.75 km out of 21 km Box cutting completed • 6 out of 12 culverts completed • 1.588 km out of 2 km Toe Wall completed • 0.95 km out of 12.20 km "U"-shaped drain completed
44	Roads	EAP/RHD/CON/1	Design, Monitoring and supervision consulting services for RHD component , Cox's bazar	Contract signed on 30 April 2019 and consultant fielded as per TOR.

58 The list of sub-projects that are Invited for Bidding (IFB) process is presented in the **Table 9** below.

Table 9 List of subprojects at IFB stage awarded to date and their possible award date

SL no.	Component	Package No.	Description	Progress to date
DPHE				
1	Water and sanitation	EAP/DPHE/W18	Construction of piped water supply with surface water reservoirs, treatment plant and other and associated facilities at Ukhiya	Lot 1: IFB published on 4 May 2020 and bid submission closed on 28 May 2020. Bid evaluation is in progress. Lot 2: IFB published on 15 June 2020 and bid submission will be closed on 12 July 2020. Lot 3: IFB published on 22 June 2020 and bid submission will be closed on 13 July 2020.
2	Water and sanitation	EAP/DPHE/W19	Design, Supply, Install, Test, Commission, Operation and Maintenance of Faecal Sludge and Segregated Solid Waste Treatment Plant	No Objection for Contract Award issued to EA on 3 May 2020. Contract is expected to be signed by 30 June 2020.
LGED				
3	Roads	EAP/LGED/OCB-N/W2A	Construction of 7.5 km Internal Roads and Stairs with Drainage Facilities Inside the camps. in Ukhiya -Group 3	IFB re-published on 17 June 2020. Bid submission will be closed on 6 July 2020.
4	Roads	EAP/LGED/OCB-N/W2B	Construction of 7.5 km Internal Roads Internal Roads and Stairs with Drainage Facilities Inside the camps in Teknaf Group 4	IFB published on 17 June 2020. Bid submission will be closed on 6 July 2020.
5	Roads	EAP/LGED/OCB-N/W4E	Improvement of Ukhiya Daroga Bazar-Moricha GC via Dakbanglo-Patabari Road by BC at Ch. 00 to 12755m under Ukhiya Upazila, District: Cox's Bazar. (Road ID: 422942002)	IFB published on 17 June 2020. Bid submission will be closed on 6 July 2020.

59 The list of sub-projects that are under bid preparation is presented in the **Table 10** below.

Table 10 List of subprojects been under bid preparation stage awarded to date

SL no.	Component	Package No.	Description	Progress to date
DPHE				
1	Water and sanitation	EAP/DPHE/G3	Supply and operation of waste management equipment/vehicle for two years for Camps in Ukhiya.	Equipment selection, specification and cost estimate are done. IFB publication is expected by 30 June 2020.
2	Water and sanitation	EAP/DPHE/G4	Supply and operation of waste management equipment/vehicle for two years for camps in Teknaf.	Equipment selection, specification and cost estimate are done. IFB publication is expected by 30 June 2020.

4.2 CONTRACT REQUIREMENTS (ENVIRONMENT)

60 The following documents, relating to the identified environmental safeguards, form part of the Contract Package and are part of the monitoring requirements in ascertaining the degree of compliance:

- a. Initial Environmental Examination (IEE)
- b. Environmental Management Plan (EMP); and

61 In addition to the foregoing, the Contractor is to provide the Project Director with a written notice of any unanticipated environmental risks or impacts that arise during construction, implementation or operation of the Plant or Works, which were not considered in the IEE's and the EMP's.

62 The general anticipated impacts for all subprojects and their mitigation measures are summarized in later paragraphs for reference of the later chapters which discuss the environmental safeguard compliance in relation to the requirements set by subproject specific EMPs.

4.2.1 Air Quality

63 During construction period the impact on air quality is mainly due to the material movement. However, air quality over a small area is affected, though, not in significant levels. There is an increase in the dust levels all along the haul roads, the borrow areas and dumping areas is expected. The emissions from the construction machinery are the source of ambient air pollution during the actual construction. Continuous use of generators, bulldozers, rollers, crane, trucks etc. give rise to the ambient levels.

64 The general mitigation measures are as follows:

- In order to curb the increased fugitive dust emissions in the area due to vehicular movement and raw material transport, provisions should be made for sprinkling of water on the haul roads in the area. Sprinkling of water should be carried out at least once a day on a regular basis during the entire construction period. Special attention should be given to all the haul roads passing through residential areas in the region. Daily inspection at haul roads and at construction site should be carried out to ensure removal of construction debris to the landfill sites.
- Covered trucks shall be used for transportation of materials prone to fugitive dust emissions. Additionally, materials which may collect on the horizontal surfaces of these trucks during loading should be removed before transportation.
- Idling of delivery trucks or other equipment should not be permitted when not in active use.
- The emission levels from diesel vehicles being used should be checked on monthly basis and brought to the required levels of emission standards.
- Proper care should be taken for storage of furnace oil, diesel, petrol etc.
- Work schedule and the operation time of construction machinery should be suitably modified to exercise a control on ambient air quality standards.
- To ensure the efficacy of the mitigation measures suggested, air quality monitoring shall be carried out as per environmental monitoring plan;
- As soon as the construction activity is over the surplus earth should be utilized to fill up the low-lying areas, if any.

4.2.2 Noise Quality

65 Noise quality is also important for the construction phase. During the construction phase, there would be an increase in ambient noise levels due to construction machinery operation and movement of construction vehicles.

66 The following mitigation measures may be adopted:

- Construction yard shall be established at least 200 m away from any residential area. This will allow the noise to attenuate.
- Special acoustic enclosures should be provided for individual noise generating equipment. Enclosures may be provided by way of noise shields, which can, be either brick masonry structure or any other physical barrier which is effective in adequate attenuation of noise levels. A 3 m structure made up of brick and mud with internal plastering and of non-reflecting surface will be very effective in this regard.
- Noise measurement should be conducted during construction to assess the prevailing noise levels. Earplugs should be provided to those workers who will be working very close to noise generating construction machinery.
- The exposure of workers to high noise levels especially, near the construction site needs to be minimized during construction period. This could be achieved by: Job rotation, Protective devices, and Noise barriers. Stationery construction equipment should not be located near human habitation in particular schools, hospitals and institutions.
- Noise levels from loading and unloading can be reduced by usage of various types of cranes and by placing materials on sand or on the beds of sandy bags.
- Use of noisy construction equipment should not be permitted during night hours near residential areas or sensitive areas.

4.2.3 Disposal of Construction Spoil and Debris

67 During construction about 15% of gravel, sand, bricks and cement is left as construction spoils. It is advocated that construction spoils shall be disposed of at a site, as approved by the local authority. The Contractor shall prepare a spoils management plan, which shall include the following:

- i. Spoils Information: Materials Type; Potential Contamination; Expected Volume and Sources; Spoil Classification
- ii. Spoils Management: Transportation of Spoil; Storage of Spoil; Contamination of Spoil; Approved Reuse and/or Disposal Sites
- iii. Records of Reuse and/or Disposal

4.2.4 Surface Water and Groundwater Contamination

68 Use of toxic materials such as solvents and vehicle maintenance fluid (oil, coolant) and diesel fuel may contaminate surface and groundwater if these are disposed of directly into the ground or washed into the streams. Human waste from construction workers may also contaminate surface water and groundwater if there are no adequate sanitary facilities.

69 The following mitigation measures can be adopted:

- All earthworks must to be conducted during dry season/dry spell to maximum extent possible to avoid the difficult working conditions that prevail during monsoon season such as problems from runoff.

- Prioritize re-use of excess spoils and materials in construction activities. If spoils will be disposed, consult with Local Authority on designated disposal areas.
- Ensure diverting storm water flow during construction shall not lead to inundation and other nuisances in low-lying areas.
- Monitor water quality according to the environmental management plan.
- Garbage disposal service to be provided, Concrete refuse reused or disposed of without habitat loss;
- All other effluents not to be disposed of directly into natural waters, but via settling basins to allow suspended sediment to settle out.
- Workforce camps will be located away from water resources. All practical measures such as provision of septic tanks, garbage bags, and other sanitation facilities will be implemented at the construction camps to prevent the wastewater and solid wastes from entering well and groundwater recharge areas.
- Wells used for drinking will be tested quarterly to ensure potability. The wells will be designated during labour camp establishment.
- Take all precautions to minimize the wastage of water in the construction activities. In this case there is no waterbody nearby. However, it needs to be noted that, no temporary or long-term waterlogging during the construction should be allowed.

4.2.5 Occupational and Health and Safety Risks

70 Occupational hazards may arise if not properly managed (risk of fall and electrocution, etc). Increase in dust may cause health problems to workers. Insufficient supply and improper use of personal protective equipment (PPE) and lack of safety procedures may cause injuries or fatal accidents. For safety there will be a need to interrupt electricity supply to existing businesses while new poles, conductors and other installations are put in place. This needs to be done in a phased manner allowing small sections of lines to be reconnected to the network, keeping down time to a minimum for existing users. Close contact with persons afflicted with diseases and lack of sanitation in worker's camps may also pose health risks. Outbreaks of diseases like diphtheria and measles can be avoided by observing proper sanitation facilities and observing good personal hygiene habits.

71 The following generic measures suggested are as followed;

- Comply with requirements of Government of Bangladesh Labour Law of 2006 (amended in 2013) and all applicable laws and standards on workers' health and safety (H&S).
- Ensure that all site personnel have a basic level of environmental awareness training. If necessary, the environmental management specialist and/or a translator shall be called to the sites to further explain aspects of environmental or social behavior that are unclear.
- Produce and implement a site H&S plan which include measures as: (i) excluding the public from worksites; (ii) ensuring all workers are provided with and required to use personal

- protective equipment (reflectorized vests, footwear, gloves, goggles and masks) at all times; (iii) providing H&S training for all site personnel; (iv) documenting procedures to be followed for all site activities; and (v) maintaining accident reports and records.
- Arrange for readily available first aid unit including an adequate supply of sterilized dressing materials and appliances
 - Maintain necessary living accommodation and ancillary facilities in functional and hygienic manner in work camps. Ensure (i) uncontaminated water for drinking, cooking and washing, (ii) clean eating areas where workers are not exposed to hazardous or noxious substances; and (iii) sanitation facilities are available at all times.
 - Provide medical insurance coverage for workers;
 - Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers;
 - Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted;
 - Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas;
 - Ensure moving equipment is outfitted with audible back-up alarms;
 - Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate; and - Disallow worker exposure to noise level greater than 85 dBA for a duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.

4.2.6 Community Health and Safety Hazards

72 Community hazards may arise during construction (dust, air quality, noise, electrocution etc.). Traffic accidents and vehicle collision with pedestrians during material and waste transportation may occur if no proper signage are placed.

73 The following Generic Measures are suggested:

- Contractor's activities and movement of staff will be restricted to designated construction areas.
- Locations of hot-mix plants, batching plants and crushers (if these establishments are being set up exclusively for the subproject) shall be located at least 100 m away from the nearest dwelling preferably in the downwind direction.

- Consult with the Local Authority on the designated areas for stockpiling of, soils, gravel, and other construction materials.
- If the contractor chooses to locate the work camp/storage area on private land, he must get prior permission from the environment management specialist and landowner.
- Use small mechanical excavators to attain faster excavation progress. For rock and concrete breaking, use non-explosive blasting chemicals, silent rock cracking chemicals, and concrete breaking chemicals.
- Under no circumstances may open areas or the surrounding bushes be used as a toilet facility.
- Recycling and the provision of separate waste receptacles for different types of waste shall be encouraged.
- A general regard for the social and ecological well-being of the site and adjacent areas is expected of the site staff. Workers need to be made aware of the following general rules:
 - (i) no alcohol/drugs on site; (ii) prevent excessive noise; (iii) construction staff are to make use of the facilities provided for them, as opposed to ad hoc alternatives (e.g. fires for cooking, the use of surrounding bushes as a toilet facility); (iv) no fires permitted on site except if needed for the construction works; (v) trespassing on private/commercial properties adjoining the site is forbidden; (vi) other than pre-approved security staff, no workers shall be permitted to live on the construction site; and (vii) no worker may be forced to do work that is potentially dangerous or that he/she is not trained to do.
- Interested and affected parties need to be made aware of the existence of the complaints book and the methods of communication available to them. The contractor must address queries and complaints by: (i) documenting details of such communications; (ii) submitting these for inclusion in complaints register; (iii) bringing issues to the environment management specialist's attention immediately; and (iv) taking remedial action as per environment management specialist's instruction.
- The contractor shall immediately take the necessary remedial action on any complaint/grievance received by him and forward the details of the grievance along with the action taken to the environment management specialist within 48 hours of receipt of such complaint/grievance.
- Create traffic regulation and diversion zones during construction work. The proposed site is on the main road, and it is expected that heavy vehicle movements can cause traffic nuisance. Therefore, traffic regulation and diversion will be important to avoid traffic nuisance.

4.2.7 Soil Erosion

74 Clearing topsoil in proposed widening areas can lead to loss of nutrient and erosion particularly along the hill cut slopes and dust from unprotected storage sites. The erosion risk at hill cut slopes is possible. Gully erosion along the exposed track slope during rainy season may cause localized sedimentation congestions.

75 The following measures are suggested:

- Topsoil storage areas must be protected during the dry season, wind erosion—by covering.
- Rapid revegetation and use of hydro-seeding and jute erosion protection mats should be applied in areas where erosion is noted during the regular monthly inspections.

4.2.8 Topography and Landscape Change

76 Visual intrusion from large piles of bridge/culverts materials and ballast obstructing views and excavation along the edge of the alignment leaving large unsafe holes is possible.

77 The following measures are suggested:

- Material stockpiles will be removed as soon as work is completed and the area re-landscaped. Same applies to borrow areas.

4.2.9 Post-construction clean-up

78 Damage due to debris, spoils, excess construction materials.

79 The following general mitigation measures are suggested:

- Remove all spoils wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required;
- All excavated roads shall be reinstated to original condition;
- All disrupted utilities restored;
- All affected structures rehabilitated/compensated;
- The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, etc. and these shall be cleaned up;
- All hardened surfaces within the construction camp area shall be ripped;
- All imported materials removed, and the area shall be top soiled and regressed using guidelines set out in the re-vegetation specification that forms part of this document;
- The contractor must arrange the cancellation of all temporary services;
- Request PIU to report in writing that worksites and camps have been vacated and restored to pre-project conditions before acceptance of work.

4.2.10 Submission of EMP Implementation Report

80 Unsatisfactory compliance to EMP.

81 The following mitigation measures are suggested:

- Appointment of Supervisor to ensure EMP implementation;
- Timely submission of monitoring reports including pictures.

4.3 FINANCING AGREEMENT

82 Financial cost provision for the Contractor to complete all the required Environmental mitigation and monitoring requirements is given in the EMP cost stipulated with the subproject specific EMPs, along with the stipulated frequency and extent of sample monitoring, in accordance with the respective Environmental Management and Monitoring Plan, of the particular contract package.

5 Environmental Status

5.1 STATUS OF ENVIRONMENTAL SAFEGUARDS DOCUMENTS

83 To date (June 2020) out of 32 B category projects according to ADB classification, 30 IEEs (including 7 indicative IEE) have been drafted with 32 EMPs and 7 ECoPs. Some EMPs and subsequent IEEs are due to either design revision or additional survey work (those are stated as indicative IEEs). **Table 11** represents the status of preparation of safeguards documents.

Table 11 Summary Status of safeguards documents preparation for B category subprojects

Agency	Total B Category project	IEE	EMP	ECoP
DPHE	13	12	13	4
LGED	15	14	15	2
RHD	02	2	2	0
REB	02	2	2	1
Total	32	30	32	7

84 To date 13 EMPs for DPHE, 15 EMPs for LGED, 2 EMPs for BREB and 2 EMPs for RHD have been prepared. Of 30 IEEs, 12 IEEs for DPHE, 14 IEEs for LGED, 2 IEEs for RHD and 2 IEEs for BREB have been prepared. Details of subproject wise status of IEE and EMP preparation has been presented in **Table 12**.

Table 12 Subproject wise status of preparation of safeguards documents

SI No.	Package No.	Category	EMP	IEE	ECoP
BREB					
01	EAP/BREB/G1	C			
02	EAP/BREB/G2A	C			Done
03	EAP/BREB/G2B	C			
04	EAP/BREB/G5	C			
05	EAP/BREB/G6A	C			
06	EAP/BREB/G6B	C			
07	EAP/BREB/G7	C			
08	EAP/BREB/W1A	B	Done	Done and disclosed	
09	EAP/BREB/W2	B	Done	Done and disclosed	
Total B category		02	02	02	01
DPHE					
01	EAP/DPHE/G1	C			Done
02	EAP/DPHE/G2	C			
03	EAP/DPHE/G3	C			
04	EAP/DPHE/G4	C			
05	EAP/DPHE/W1	B	Done; Revised once due to design review for final distribution network.	Done and disclosed	

SI No.	Package No.	Category	EMP	IEE	ECOP
06	EAP/DPHE/W2	B	Done; Revised twice due to merging of two subprojects into one package; and design review for final distribution network.	Done and disclosed	
07	EAP/DPHE/W3	B	Done; Revised thrice due to merging of packages and design review for final distribution network.	Done and disclosed	
08	EAP/DPHE/W4	B	Indicative EMP done; Revised twice due to merging of packages and design review for final distribution network.; Final revision will be done after receiving the final design of distribution network.	Done and disclosed	
09	EAP/DPHE/W5	B	Indicative EMP done; Revised twice due to merging of packages and design review for final distribution network; Final revision will be done after receiving the final design of distribution network.	Indicative IEE done but revision required; see EMP status.	
10	EAP/DPHE/W9A	B	Done; Revised thrice due to location change and inclusion of package W19 in the premise of W9A.	Done and disclosed	
11	EAP/DPHE/W9B	B	Done; Revised twice due to location change.	Done and disclosed	
12	EAP/DPHE/W10	B	Done; Revised twice due to location and design changes.	Done and disclosed	
13	EAP/DPHE/W11	B	Indicative EMP done. Final version will be come out after final design of distribution pipeline, ground reservoir and location of OHTs etc.	Indicative IEE done but revision required see EMP status.	
14	EAP/DPHE/W12A	B	Indicative EMP done; Revised twice due to spilt the package into two Lots; Final version will be come out after final design of distribution pipeline and location of SWTP.	Indicative IEE done but revision required; see EMP status.	
15	EAP/DPHE/W12B	B	Indicative EMP done. Final version will be come out after final design of distribution pipeline and location of the SWTP.	Indicative IEE done but revision needed, see EMP status.	
16	EAP/DPHE/W13	C			Done
17	EAP/DPHE/W14	C			Done
18	EAP/DPHE/W15	C			Done
19	EAP/DPHE/W18	B	Indicative EMP done. Final version will be come out after final design of SWTP, transmission and distribution pipeline and location of the ground reservoirs etc.	IEE yet to be do after doing environmental survey and public consultation.	
20	EAP/DPHE/W19	B	Done	IEE prepared, but revision needed.	
21	EAP/DPHE/CON/1				
Total B category		13	13	12	04
LGED					
01	EAP/LGED/OCB-N/W1A	B	EMP done, 3 rd revision	Done	
02	EAP/LGED/OCB-N/W1B	B	EMP done, 1 st revision	Done and disclosed	
03	EAP/LGED/OCB-N/W2A	B	EMP done, 5 th revision	Done and disclosed	

SI No.	Package No.	Category	EMP	IEE	ECoP
04	EAP/LGED/OCB-N/W2B	B	EMP done, 5 th revision	Done and disclosed	
05	EAP/LGED/OCB-N/W3	B	EMP done, 4 th revision	Done and disclosed	
06	EAP/LGED/OCB/W4C	B	EMP done, 2 nd revision	Done and disclosed	
07	EAP/LGED/OCB/W4D	B	EMP done, 3 rd revision	Done and disclosed	
08	EAP/LGED/OCB-N/W5	B	EMP done 4 th revision	Done and disclosed	
09	EAP/LGED/OCB-N/W6	B	EMP done, 2 nd revision	Done and disclosed	
10	EAP/LGED/OCB-N/W8	B	EMP done, 2 nd revision	Done and disclosed	
11	EAP/LGED/OCB-N/W9	B	EMP done, 2 nd revision	Done and disclosed	
12	EAP/LGED/OCB-N/W10	B	EMP done, 2 nd revision	Indicative IEE done	
13	EAP/LGED/W19	C			Done
14	EAP/LGED/OCB-N/W20	B	EMP done, 4 th revision	Indicative IEE done, needs main design set to finalize	
15	EAP/LGED/OCB-N/W21	B	EMP done, 2 nd revision	Indicative IEE done, needs main design set to finalize	
16	EAP/LGED/W6A	C			Done
17	EAP/LGED/OCB/W4E	B	EMP done	Yet to do	
18	EAP/LGED/CON/1				
Total B category		15	15	14	02
RHD					
01	EAP/RHD/W1	B	Done	Done and disclosed	
02	EAP/RHD/W2	B	Done	Done and disclosed	
03	EAP/RHD/C ON/1				
Total B category		02	02	02	
Grand Total (B category)		32	32	30	07

85 For a detailed information on safeguards documents produced, see **Figure 4** below.

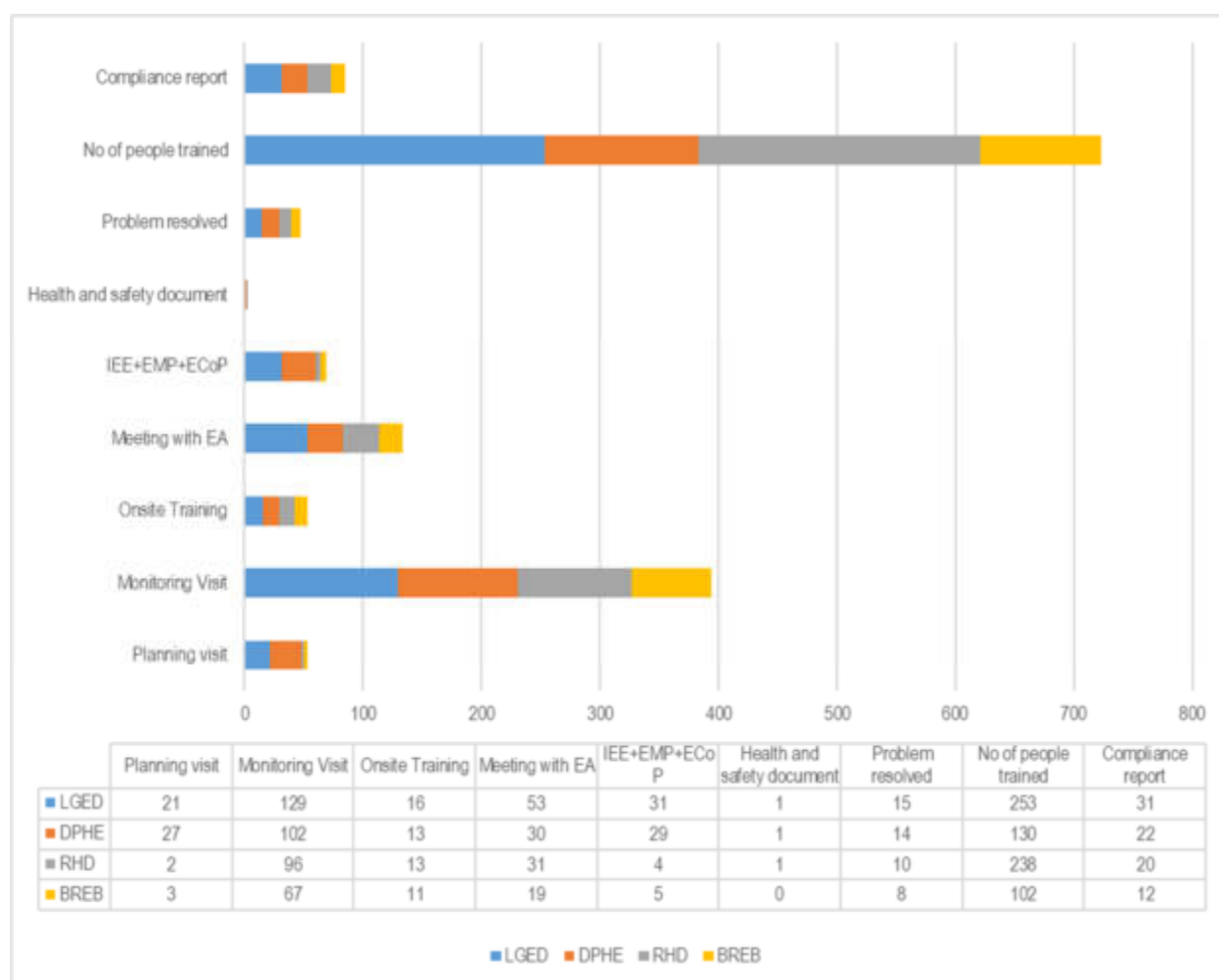


Figure 4 Comparative analysis of safeguard documents produced during monitoring (June 2020)

5.2 ENVIRONMENTAL SAFEGUARDS MONITORING

86 An environmental assessment, using ADB's Rapid Environmental Assessment (REA) checklist for urban development, was conducted and the results of the assessment demonstrated that the subprojects will not cause significant adverse impacts. The proposed infrastructure development programme is classified as Environmental Category B as per the ADB's SPS 2009, as no significant impacts are envisioned. The related initial environmental examination (IEE) reports has been prepared in accordance with ADB SPS 2009 requirements for environment category B projects and provide mitigation and monitoring measures, for no envisaged significant impacts, as a result of implementing the subprojects.

87 The environmental mitigation measures, as stipulated in the respective EMP's and in the obtained environmental permit, are monitored during the implementation programme. In order to monitor the respective EMP's, environmental specialists from ADB and one environmental specialist from each DMSC are working as a team with the support of ADB safeguards team.

88 There are no indigenous people present in the subproject areas and so no impact on Indigenous peoples (IPs). These subprojects are hence categorized as Category C for Indigenous People. Therefore, no Indigenous Peoples Development Plan (IPDP) is required for this subproject.

89 The environmental mitigation measures, as stipulated in respective EMP's for the currently active civil works contract packages, are monitored as part of this EMR-04.

5.2.1 Monitoring Visits

90 In response to the novel coronavirus, government declared a general holiday and lockdown initially from 26 March to 05 April 2020 and extended up to 30 May 2020 later on. Once the situation continued to deteriorate and Cox's Bazar is identified as a red zone in terms of COVID-19 infection, the government has again declared lockdown from 6 - 30 June 2020 in Cox's Bazar. In the meantime, through a notification dated on 05 May 2020 instructions were given to the development ministries to work on a limited scale in the emergency project area. The restrictions on travel, public gatherings and certain business operations introduced have significantly affect environmental monitoring activity at EAP construction sites.

91 During planning phase in 4th six-month January- June 2020, a total 10 visits have been conducted by the Environmental specialists appointed by ADB. Besides, until date 87 environmental safeguards monitoring visits have been conducted at different times during the current cycle (4th six-month January-June 2020) of monitoring period. See **Table 13** for details break down. **Figure 5 Planning visit to LGED' internal road package (left) and DPHE' water supply package (right)** presents some photographs of planning visits. Also see photographs of monitoring visits in **Figure 5 Planning visit to LGED' internal road package (left) and DPHE' water supply package (right)**. Environmental compliance report has been submitted to the concerned EA and ADB based on site visit and follow ups were tracked to observe corrective measures and desired progress.

Table 13 Environmental safeguards monitoring visit conducted during January- June 2020

Site Visit During Planning Phase	Site Visit During Construction Phase				Total
	BREB	DPHE	LGED	RHD	
10	14	20	39	14	97



Figure 5 Planning visit to LGED' internal road package (left) and DPHE' water supply package (right)



Figure 6 Monitoring visit to RHD/W1' work site (left) and DPHE/W9B' work site (right)

Table 14 Environmental monitoring visits and trainings conducted during January- June 2020

Date	DPHE						LGED										RHD		BREB							
	W1	W2	W3	W4	W5	W10	W9A	W9B	W1B	W8	W3	W5	W6	W9	W19	W20	W21	W4C	W1	W2	W1A	W2	G2B	G5	G6	G7
7/1/2020																										
12/1/2020																										
18/1/2020																										
21/1/2020																										
10/2/2020																										
15/2/2020																										
22/2/2020																										
26/2/2020																										
29/2/2020																										
2/3/2020																										
3/3/2020																										
4/3/2020																										
8/3/2020																										
25/6/2020																										
27/6/2020																										

Legend	Visit
	Training

5.3 CONSTRUCTION PERIOD ENVIRONMENTAL QUALITY MONITORING

92 In order to ensure proper implementation of the environmental safeguard requirements during the construction period, Contractors have appointed third party organizations for testing of required environmental parameters (air quality, noise quality, surface water quality and groundwater quality). All instruments used by the organization are maintained following International Standards and calibrated regularly in accordance with the manufacturer's instructions (**Table 15**).

Table 15 Parameters, methods and laboratory for environmental quality sampling

Environmental Quality	Parameters	Methodology
Ambient Air Quality	PM10 and PM2.5	LATA Envirotech APM 250 with Combined PM10 Sampler and/or optical sensor mass measurement process
	SOx, NOx	LATA Envirotech LES 411
	CO	HTC CO-01 meter
Noise Level	Leq in dB	HTC Sound Level Meter
Surface Water Quality	pH and EC	Onsite test using EZDO 8200 Multi-meter
	Turbidity, TSS, DO, BOD, COD, Cl- and Ammonia	Samples collected from site & sent to the Laboratory for analysis.
Groundwater Quality	pH, EC and TDS	EZDO 8200 Multi-meter
	Fe, Mn, As, Cl-, TC, FC	Samples collected from site & sent to the Laboratory for analysis.

5.3.1 Air Quality

93 Ambient air quality data at the project site measured to verify the current quality of air. The aim was to collect the existing air quality data and to compare the data with the air quality during project implementation phase to check if there is any high air pollution level due to the construction activities and to design adequate mitigation measures, as applicable. Dispersal of pollutants depends upon factors like prevailing wind direction and other weather conditions, atmospheric stability, height of the source. Ambient air quality testing was performed at DPHE/W1, DPHE/W2, DPHE/W3, DPHE/W5 and DPHE/W10 area in 1st quarter (January-March) of 2020 (**Figure 7**). Filter and each chemical were measured before testing. Electro-Chemical Sensor device were calibrated before testing some other parameters. Results of the air quality monitored at the project location have been showed in **Table 16**. The details of this result are shown in Appendix III of this report.



DPHE/W1/AAQ-1 in KRC



DPHE/W2/AAQ-1 in Camp 2W



DPHE/W3/AAQ-1 in Camp 5



DPHE/W5/AAQ-1 in Camp 8W

Figure 7 Air quality monitoring in project sites

Table 16 Test results of ambient air quality monitoring

Sample ID	Sampling Location	GPS Location	Parameters				
			PM2.5 ($\mu\text{g}/\text{m}^3$)	PM10 ($\mu\text{g}/\text{m}^3$)	SO ₂ ($\mu\text{g}/\text{m}^3$)	NO ($\mu\text{g}/\text{m}^3$)	CO PPM
DPHE/W1/AAQ_01	Camp 13	21°10.132' N 92°08.434' E	34	83	-	-	-
DPHE/W1/AAQ_02	Camp 13	21°10.696' N 92° 08.324' E	32	71	-	-	-
DPHE/W1/AAQ_03	KRC 1	21.12688°N 92.09811°E	36	87	-	-	-
DPHE/W1/AAQ_04	KRC 2	21.12617°N 92.09904°E	39	74	-	-	-
DPHE/W1/AAQ_05	Camp 8W	21°11.832' N 92°09.229' E	42	91	-	-	-
DPHE/W2/AAQ_01	Camp 2W	21.20822°N 92.15891°E	20.52	57.32	18.80	14.21	<1
DPHE/W3/AAQ_01	Camp 5	21.19769°N 92.14836°E	27.1	63.8	28.2	11.3	1
DPHE/W3/AAQ_02	Camp 2W	21.20950°N 92.16093°E	26.3	62.4	26.6	10.9	<1

Sample ID	Sampling Location	GPS Location	Parameters				
			PM2.5 ($\mu\text{g}/\text{m}^3$)	PM10 ($\mu\text{g}/\text{m}^3$)	SO2 ($\mu\text{g}/\text{m}^3$)	NO ($\mu\text{g}/\text{m}^3$)	CO PPM
DPHE/W5/AAQ_01	Camp-8W	21.19869°N 92.15635°E	24.5	64.6	23.2	19.8	<1
DPHE/W10/AAQ-1	DEWATS-1 Camp 23	-	34	79	10	26	0.02
DPHE/W10/AAQ-2	DEWATS-2 Camp 23	-	37	86	10	23	0.01
DPHE/W10/AAQ-3	DEWATS-3 Camp 23	-	39	91	0	25	0.01
*Bangladesh Standard for Ambient Air Quality			65	150	365	100	9
Duration (hour)			24	24	24	Annual	8

* The Bangladesh National Ambient Air Quality Standards have been taken from the Environmental Conservation Rules, 1997 which was amended on 19th July 2005 vide S.R.O. No. 220-Law/2005.

94 **PM10:** Particle pollution, also called particulate matter or PM, is a mixture of solids and liquid droplets floating in the air. Some particles are released directly from a specific source, while others form in complicated chemical reactions in the atmosphere. PM10 are 2.5 to 10 micrometers in diameter. Sources include grinding operations and dust stirred up by vehicles on roads. From the above table of test results, it is seen that, for all the locations, the values were within the national standard.

95 **PM2.5:** PM2.5 are 2.5 micrometers in diameter or smaller, and can only be seen with an electron microscope. Fine particles are produced from all types of combustion, including motor vehicles, power plants, residential wood burning, forest fires, agricultural burning, and some industrial processes. The test results show that for the locations the values of PM2.5 was within the national standards.

96 **SOx:** Sulfur oxides (SOx) are compounds of sulfur and oxygen molecules. Sulfur dioxide (SO2) is the pre-dominant form found in the lower atmosphere. It is a colorless gas that can be detected by taste and smell in the range of 1,000 to 3,000 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). Concentration of SO2 for all the sample ranges from 10 to 28.2 $\mu\text{g}/\text{m}^3$ which is within national standard for air quality.

97 **NOx:** In atmospheric chemistry, NOx is a generic term for the nitrogen oxides that are most relevant for air pollution, namely nitric oxide (NO) and nitrogen dioxide (NO2). These gases contribute to the formation of smog and acid rain, as well as tropospheric ozone. For all the location the values of NOx are ranges from 10.9 to 26 $\mu\text{g}/\text{m}^3$.

98 **CO:** Carbon monoxide is a gas and is found in air. High levels of carbon monoxide are poisonous to humans and, unfortunately, it cannot be detected by humans as it has no taste or smell and cannot be seen. The main sources of additional carbon monoxide are motor vehicle exhaust and some industrial activities, such as making steel. Cigarette smoking and cooking is major indoor sources of carbon monoxide. CO was within the national standard for all the sampling locations.

99 The air quality in the project area has slightly deteriorated along the roadside areas of the camps because of increased traffic. Brick kilns in Ukhia and Teknaf may also be contributing to the problem. The monitoring team did not notice a significant impact in the camps but inhabitants have reported that they suffer from the dust generated from the loose soil when strong winds blow; serious dust pollution during stormy winds is an issue. From a health point of view, this should not be a great concern as the size of the dust particles does not allow them to penetrate into the respiratory tract. The area of influx is hilly and close

to the sea, and this geographical location, coupled with the limited amount of industry in the area; means that air quality remains within acceptable limits.

5.3.2 Noise Level Measurement

100 A-weighted sound pressure level was measured at the construction sites during normal working hours by using calibrated noise level meter. Noise level was measured in 1st quarter of 2020 from active construction sites during day time for 2 hours (**Figure 8**). Noise level was measured using a calibrated HTC Sound Level Meter set to A-weighting, slow response and statistical analysis settings. The values of noise levels at project sites are presented in **Table 17**. The details result is given in Appendix III of this report.



DPHE/W1/NM-01 in KRC



DPHE/W2/NM-2 in Camp 2W



DPHE/W3/NM-10 in Camp 13



DPHE/W5/NM-5 in Camp 8W

Figure 8 Noise level monitoring in project sites

Table 17 Test results of noise level monitoring

Sample ID	Sample Location	Time		Noise Level (dBA) (LAeq)	Bangladesh Standard*	Land Use Category
		Start	End			
EAP/DPHE/W1/NM-1	KRC-1	11:00 AM	6:00 PM	59.68	60	Mixed Area
EAP/DPHE/W1/NM-2	KRC-2	11:15 AM	6:15 PM	58.17	60	Mixed Area
EAP/DPHE/W1/NM-3	Camp 8W, I-20	10:00 AM	5:00 PM	58.58	60	Mixed Area
EAP/DPHE/W2/NM-1	Camp: 2W.4 Block-D	11:00 am	01:00 pm	53.3	60	Mixed Area
EAP/DPHE/W2/NM-2	Camp: 2W-D5	01:15 pm	03:15 pm	58.1	60	Mixed Area
EAP/DPHE/W2/NM-3	Camp: 2W	10:30 am	12:30 pm	61.2	60	Mixed Area
EAP/DPHE/W2/NM-4	Camp: 2W-D4	12:45 pm	02:45 pm	54.7	60	Mixed Area
EAP/DPHE/W2/NM-5	Camp: 2W-D4	03:00 pm	05:00 pm	53.8	60	Mixed Area
EAP/DPHE/W3/NM-1	WDZ:2E.03	9:10 am	11:10 am	65.2	60	Mixed Area
EAP/DPHE/W3/NM-2	WDZ: 2E.02	11:34 am	01:34 pm	59.3	60	Mixed Area
EAP/DPHE/W3/NM-3	WDZ: 2E.01	02:10 pm	04:10 pm	54.8	60	Mixed Area
EAP/DPHE/W3/NM-4	WDZ: 2W.06	08:30 am	10:30 am	59.3	60	Mixed Area
EAP/DPHE/W3/NM-5	WDZ: 2W.05	11:05 am	01:05 pm	65.7	60	Mixed Area
EAP/DPHE/W3/NM-6	WDZ: 2W.01	01:20 pm	03:20 pm	58.4	60	Mixed Area
EAP/DPHE/W3/NM-7	WDZ: 5.06	08:15 am	10:15 am	57.7	60	Mixed Area
EAP/DPHE/W3/NM-8	WDZ:5.5	10:40 am	12:40 pm	61.1	60	Mixed Area
EAP/DPHE/W3/NM-9	WDZ:5.4	12:58 pm	02:58 pm	60.9	60	Mixed Area
EAP/DPHE/W3/NM-10	WDZ: 13.2	03:15 pm	05:15 pm	58.3	60	Mixed Area
EAP/DPHE/W5/NM-1	WDZ:5.03	11:00am	01:00 pm	58.5	60	Mixed Area
EAP/DPHE/W5/NM-2	WDZ: 8E.03 Bazar	01:15 pm	03:15 pm	57.2	60	Mixed Area
EAP/DPHE/W5/NM-3	WDZ: 8W.6	10:00 am	12:00 pm	54.6	60	Mixed Area
EAP/DPHE/W5/NM-4	WDZ: 8W.4 (Ext)	12:15 pm	02:15 pm	64.1	60	Mixed Area
EAP/DPHE/W5/NM-5	WDZ: 8W.9	02:30 pm	04:30 pm	59.3	60	Mixed Area
EAP/DPHE/W10/NM-1	DEWATS-1, Camp 23	-	-	54.62	60	Mixed Area
EAP/DPHE/W10/NM-2	DEWATS-2, Camp 23	-	-	55.35	60	Mixed Area
EAP/DPHE/W10/NM-3	DEWATS-3, Camp 23	-	-	54.90	60	Mixed Area

*Notes: Land use category is based on the classification provided in the Noise Pollution Control Rules (2006), The sound level standards for mixed area are 60 at day time and 50 at night time. Noise Level is the average noise recorded over the duration of the monitoring period.

101 The Noise Pollution (Control) Rules 2006 were adopted under Section 20 of the Bangladesh Environment Conservation Act 1995 with a view to laying down the specific guidelines regarding noise pollution and the degree of allowable noise in different areas.

102 The Rules lay down the permitted noise levels for both day and night-time in five types of areas: silent areas, residential areas, mixed areas, commercial areas and industrial areas. Silent areas include hospitals, educational institutions, offices and similar establishments, and their surrounding 100-meter area. Silent areas are areas where the noise level is to be kept at the lowest (50 decibels at day and 40 decibels at night); permitted noise level for residential areas is 55 decibels at day and 45 decibels at night. In industrial areas, where the highest noise levels are permitted, the limit is 75 decibels at day and 70 decibels at night. As per the Rules, the hours between 6 am and 9 pm are to be considered as daytime, and the remaining hours are considered as night-time. A separate range is prescribed for vehicular noise under Schedule-Z to the Rules, and the use of horns is completely prohibited in areas identified as silent areas.

103 However, in case of any social (weddings), cultural (sports, concerts, fairs and bazars) or political events in open or partially open spaces, the sound level can be exceeded if permission is obtained three days before the event. In case of urgent situations, permissions can be sought one day in advance as well. However, no such permission will allow for such exceedance beyond five hours and in any case, the time extension can be only up to 10 pm.

104 The Rules also state that no construction machines used to process and break down building materials (bricks, stones etc.) shall be used within 500 meters of any residential areas and such machineries cannot be used between 7 pm and 7 am except without the permission of the concerned authorities.

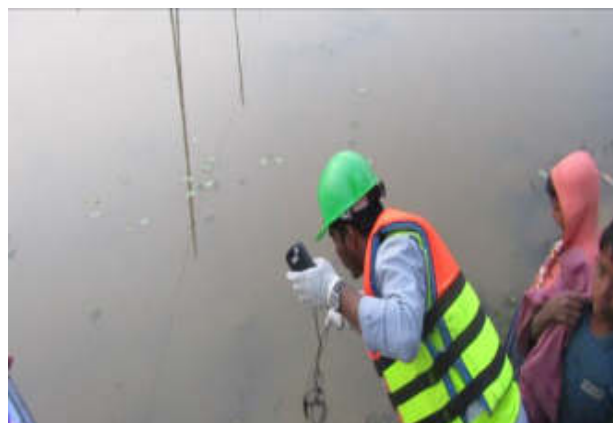
105 However, increased traffic on the Cox's Bazar-Teknaf road and small bazar in the camps are the main sources of noise. The impact of noise generation on the settlements is not significant as most of the camps are at some distance from the road. Some internal roads have been constructed to facilitate the connectivity between the camps, but traffic on these roads is still very light. The test result revealed that noise level is not much disturbing due to project components. Different types of residential, educational and religious institutions are located near the project sites which increase the level of noise. Moreover, noise originating from communication among the Rohingya people, service providers, relief distributors, and from a sharp increase in vehicular movement. However, the level of noise was within the limit of Mixed Area as per DoE standard and was satisfactory.

5.3.3 Surface Water Quality

106 The surface water sample was collected in 1st quarter (January-June) 2020 from water bodies flows through the camps (**Figure 9**). The quality of surface water is to be monitored through laboratory analysis collected from at least 1m from the bank/shore of the waterways from the major streams along the project site. Polyethylene bottles (PET bottles) of 1 liter were recommended for samples to measure physical and chemical parameters. EZDO-8200 Multi-meter was used to conduct the on-site test of pH and EC for surface water. The collected samples were sent to different laboratories such as Department of Public Health Engineering (DPHE), NGO Forum etc. for other remaining parameters. Before collecting water sample, bottles were washed with distilled water. Results of the surface water quality at the project location are presented in **Table 18**. The Laboratory test result is given in Appendix III of this report.



DPHE/W3/SW-1 in Camp 5



DPHE/W5/SW-1 in Camp 8W



DPHE/W1/SW-3 in Camp 8W



DPHE/W1/SW-1 in Camp 8W

Figure 9 Surface water sampling and onsite testing in project sites

Table 18 Test results of surface water quality monitoring

Sample ID	Sampling Location	Surface water parameters										
		Turbidity NTU	pH	EC $\mu\text{s}/\text{cm}$	TSS mg/l	TDS mg/l	DO mg/l	BOD5 mg/l	COD mg/l	Cl- mg/l	NH3-N mg/l	Oil and Grease mg/l
DPHE/W1/SW-01	Camp 13	-	8.13	-	-	476	1.9	41	157	-	-	14.13
DPHE/W1/SW-02	Camp 13	-	7.21	-	-	391	4.8	13	36	-	-	2.11
DPHE/W1/SW-03	KRC 1	-	7.19	-	-	520	4.9	12	31	-	-	1.71
DPHE/W1/SW-04	KRC 2	-	8.19	-	-	534	1.2	39	148	-	-	16.11
DPHE/W1/SW-05	Kutupalong	-	8.81	-	-	324	1.5	29	117	-	-	11.14
DPHE/W3/SW-01	Camp 5	1665	8.3	894	45	-	3.9	28	143	87	5.41	-
DPHE/W5/SW-01	Camp-8W	1659	7.9	865	41	-	3.6	26	118	82	6.9	-
DPHE/W10/SW-1	DEWATS-1 Camp 23	-	8.1	22.6	≤ 2	-	4.8	14	50	-	-	-
DPHE/W10/SW-2	DEWATS-2 Camp 23	-	8.1	24.1	≤ 2	-	4.5	13.1	43	-	-	-
DPHE/W10/SW-3	DEWATS-3 Camp 23	-	7.5	50860	≤ 2	-	5.2	9.3	29	-	-	-
* Standards for Inland Surface Water		NYS	6-9	1200	150	2100	4.5-8	50	200	600	50	10

* Standards for Waste Water from Industrial Units or Projects is followed Environmental Conservation Rule (ECR)'97

107 **Turbidity:** Turbidity is a measure of the degree to which the water loses its transparency due to the presence of suspended particulates. The more total suspended solids in the water, the murkier it seems and the higher the turbidity. Turbidity is considered as a good measure of the quality of water. Turbidity of the project location was found 1665 and 1659 NTU in DPHE/W3/SW-01 and DPHE/W5/SW-01 respectively.

108 **pH:** The "desirable" range of pH prescribed by the DOE is between 6-9. This is the range, which provides adequate protection to the life of fresh water fish and bottom dwelling invertebrates. The pH value of the collected sample was within the national standard ranges from 7.19 to 8.81.

109 **Electrical Conductivity (EC):** EC stands for electrical conductivity, which measures the potential for a material to conduct electricity. The test results show that one surface water samples has exceeded the national standard of EC value which was 50860 $\mu\text{S}/\text{cm}$.

110 **Total Suspended Solids (TSS):** Total suspended solids (TSS) are the dry-weight of particles trapped by a filter. The test results show that TSS values are within the national standard according to ECR,1997.

111 **Total Dissolve Solids (TDS):** TDS values indicate the general nature of water quality and are usually related to conductivity. However, the values of TDS of all the samples collected throughout the project area are within the standard limit ranges from 391/l and 534 mg/l.

112 **Dissolved Oxygen (DO):** Dissolved oxygen is necessary for many forms of life including fish, invertebrates, bacteria and plants. Decrease in DO values below the critical level of 3 mg/l causes death of most fishes and other aerobic aquatic organisms. The DO value depicts that water bodies flows through mega camps are contained minimal oxygen where aquatic species cannot survive, however, water samples collected from camp 23 are within standard. Rohingya people throw their household and other waste into this canal that polluted the water and decrease the DO level.

113 **Biochemical Oxygen Demand (BOD₅):** Biochemical Oxygen Demand is supposed to measure the amount of food (or organic carbons) that bacteria can oxidize. The standard for inland surface water for BOD₅ is 50 mg/l. The test results show that BOD₅ value was detected within the national standard.

114 **Chemical Oxygen Demand (COD):** Chemical Oxygen Demand is the total measurement of all chemicals in the water that can be oxidized. The value of COD was ranges from 29 to 157 mg/l which is within the national standard.

115 **Chloride:** Chlorides are important in detecting the contamination of water by sewage. Chlorides are leached from various rocks into soil and water by weathering. The chloride ion is highly mobile and is transported to closed basins or oceans. The test results show that Chloride value was found within the national standard.

116 **NH₃-N:** Nitrogen is an essential nutrient that is required by all plants and animals for the formation of amino acids. In its molecular form, nitrogen cannot be used by most aquatic plants; therefore, it must be converted to another form. The test results show that the value of NH₃-N was found within the national standard.

117 **Oil and Grease:** Presence of oil and grease are detected in the surface water samples collected under DPHE/W1 package. Of them 3 samples exceeded the standard limit set by Department of Environment which are DPHE/W1/SW-01, DPHE/W1/SW-05 and DPHE/W1/SW-06.

118 The values of above mentioned parameters except Oil and grease were with the acceptable limit of Department of Environment (Standard for Waste water from Industrial Units or Project wastes, Environmental conservation Rules 13, 1997). Nevertheless, the water is basic type as per pH values which may cause skin diseases in the long run. Furthermore, the canal water has very low amount of Dissolved Oxygen, which is unfavorable for aquatic life. TDS, BOD and COD of the canal water is comparatively higher than normal surface water. Therefore, it is recommended that the canal is not safe for drinking or any kind of domestic uses.

5.3.4 Groundwater Quality

119 Groundwater samples are collected from tube well in located along the project sites in the first quarter of 2020 (**Figure 10**). Those tube wells are used for drinking and bathing purposes. Adoption of every possible precautions has been suggested to obtain representative samples in polyethylene bottles (PET bottles) of 1 liter for physical and chemical parameters by rinsing the bottles thrice before sampling and securely sealing them for avoiding aeration. EZDO-8200 Multi-meter was used the conduct the on-site test of pH, EC and TDS and for remaining parameters samples are sent to laboratories. Results of the ground water quality at the project location have been showed in **Table 19**. The Laboratory test result is given in Appendix III of this report.



DPHE/W1/GW-1 in Camp 13



DPHE/W2/GW-1 in Camp 8W

Figure 10 Groundwater sampling in project site

Table 19 Test results of groundwater quality monitoring

Sample ID	Sampling Location	Groundwater parameters											
		pH	T. Hardness mg/l	Alkalinity	TDS mg/l	Fe mg/l	As mg/l	Mn mg/l	Cl- mg/l	S mg/l	Pb mg/l	TC N/100 ml	FC N/100ml
DPHE/W1/GW-01	Camp 13	7.14	84	67	154	0.91	0.011	-	79.3	<0.001	<0.001	-	-
DPHE/W1/GW-02	Camp 13	7.20	79	71	181	0.84	<0.001	-	77.5	<0.001	BDL	-	-

Sample ID	Sampling Location	Groundwater parameters											
		pH	T. Hardness mg/l	Alkalinity	TDS mg/l	Fe mg/l	As mg/l	Mn mg/l	Cl- mg/l	S mg/l	Pb mg/l	TC N/100 ml	FC N/100ml
DPHE/W1/GW-03	KRC 1	7.11	69	62	210	0.22	<0.001	-	79.1	<0.001	BDL	-	-
DPHE/W1/GW-04	KRC 2	7.20	72	68	230	0.73	0.017	-	72.1	<0.001	0.006	-	-
DPHE/W1/GW-05	Camp 8W	7.21	78	70	174	0.91	<0.001	-	75.1	<0.001	<0.0001	-	-
DPHE/W2/GW-01	Camp 2W	6.70	-	-	125	0.15	0.001	0.46	17	-	-	0	0
DPHE/W10/GW-1	DEWATS-1 Camp 23	7.80	-	-	355	0.20	<0.003	0.1	183	-	-	0	0
DPHE/W10/GW-2	DEWATS-2 Camp 23	7.80	-	-	458	0.18	<0.003	<0.1	244	-	-	0	0
DPHE/W10/GW-3	DEWATS-3 Camp 23	7.90	-	-	457	0.10	<0.003	<0.1	244	-	-	280	200
* Standards for Drinking Water		6.5-8.5	200-500	-	1000	0.3-1.0	0.05	0.1	150-600	0	0.05	0	0

* Standards for Drinking Water followed Environmental Conservation Rule (ECR)'97

120 **pH:** pH is a measure of the hydrogen ion concentration in water and indicates whether the water is acidic or alkaline. The measurement of alkalinity and acidity of pH is required to determine the corrosiveness of the water. From the test result of the groundwater, it is observed that pH values are within national standard ranges from 6.7 to 7.9.

121 **Total Hardness:** Total hardness is an important criterion for determining the suitability of groundwater for domestic, agricultural and industrial uses. As per Bangladesh standard for drinking water quality, permissible limit for hardness is lies between 150 to 600 mg/l. Hardness varied in the range of 69 to 84mg/l. It is observed that the groundwater sample collected the project sites contains soft water within standard limit for drinking water.

122 **Alkalinity:** Alkalinity is the measure of the resistance of water to the lowering of pH when acids are added to the water. However, Alkalinity is often related to hardness because the main source of alkalinity is usually from carbonate rocks (limestone) which are mostly CaCO₃. Test result depicts that the value of Alkalinity ranges from 62 to 71 within safe limit since the amount of Alkalinity that should be in drinking water is 20-200 mg/L for typical drinking water.

123 **Total dissolved solids (TDS):** TDS values indicate the general nature of water quality and are usually related to conductivity. However, the value of TDS of the sample collected was found ranges from 125 to 458 mg/l and it was within the national standard.

124 **Iron (Fe):** Natural waters contain variable amounts of iron depending on the geological area and other chemical components of the waterway. Iron in groundwater is normally present in the ferrous or bivalent form [Fe⁺⁺] which is soluble. It is easily oxidized to ferric iron [Fe⁺⁺⁺] or insoluble iron upon exposure to air. The concentration of iron is within the national standard for the project area and the value varies between <0.003 and 0.91 mg/l.

125 **Manganese (Mn):** Mn values indicate the general nature of water quality. The values of Mn in all tested drinking water samples are within the Bangladesh Standard for Drinking Water Quality except

DPHE/W2/GW-01. The value (0.46 mg/l) is not something to be worried since rainwater will recharge the groundwater table and will naturally address the contamination.

126 **Arsenic:** Arsenic is a natural component of the earth's crust and is widely distributed throughout the environment in the air, water and land. It is highly toxic in its inorganic form. People are exposed to elevated levels of inorganic arsenic through drinking contaminated water, using contaminated water in food preparation and irrigation of food crops, industrial processes, having contaminated food and smoking cigarettes. The test result shows that the concentration of Arsenic is within the national standards for the project area.

127 **Chloride:** Chlorides are important in detecting the contamination of groundwater by sewage. Chlorides are leached from various rocks into soil and water by weathering. The chloride ion is highly mobile and is transported to closed basins or oceans. Chloride occurs in all-natural water in widely varying concentration. The chloride content normally increases as the mineral content increases. The test result shows that the concentration of chloride is detected within acceptable limit.

128 **Sulfide (S):** The Sulphur content in groundwater samples were confirmed and test result shows that the concentration of Sulfide is below the standard limit for the project area. It might be occurred due to depth and layer of the tube well/area but not for the project proponents.

129 **Lead (Pb):** Continuous extraction may contaminate groundwater with heavy metals, therefore the collected groundwater samples are tested for lead but the result was satisfactory and detected in trace amount level.

130 **Total Coliform (TC):** Total coliforms are a group of bacteria that are widespread in nature. All members of the total coliform group can occur in human feces, but some can also be present in animal manure, soil, and submerged wood and in other places outside the human body. Thus, the usefulness of total coliforms as an indicator of fecal contamination depends on the extent to which the bacteria species found are fecal and human in origin. The values of TC were nil for the project area except DPHE/W10/GW-3 collected from Shamlapur detected as 280 per 100ml.

131 **Faecal Coliform (FC):** The presence of fecal coliform bacteria in aquatic environments indicates that the water has been contaminated with the fecal material of man or other animals. Faecal Coliform bacteria indicate the presence of sewage contamination of a waterway and the possible presence of other pathogenic organisms. Like TC, FC count is also marginally higher in DPHE/W10/GW-3 found as 200 per 100ml.

132 As it can be seen, all the parameters were within the safe limit for Bangladesh as per ECR 1997. Only for DPHE/W10/GW-3 collected from camp 23, the TC and FC counts were marginally higher. It may be linked to the age of the tube wells and proximity to the pit latrine as in some older tube wells can have some penetration from the adjacent pit latrines and the TC and FC tends to go up. Still, the values are not something to be worried since rainwater will recharge the groundwater table and will naturally address the microbial contamination. However, this site needs routine monitoring to ensure the water biological characteristics and if needed the defective wells can be replaced.

5.3.5 Soil Quality

133 The soil samples were collected from 15 cm deep at different sampling points located along the project site (**Figure 11**). Appropriate analytical methods have been used for analyzed of the samples; the results are in **Table 20**. The Laboratory test result is given in Appendix III of this report. However, there is

no specific level standard for Soil quality parameters for (DoE) Bangladesh since Chinses reference value is used to justify the test result.



DPHE/W1/S-1 in Camp 13



DPHE/W1/S-2 in KRC

Figure 11 Soil sampling at different locations in project site

Table 20 Test results of soil quality monitoring

Sample ID	Sampling Location	Soil quality parameters			
		Nitrogen (N) g/kg	Phosphate (PO ₄) g/kg	Oil and Grease g/kg	Organic Matter g/kg
DPHE/W1/S-01	Camp 13	1.63	1.42	0.35	13.2
DPHE/W1/S-02	Camp 13	1.35	1.49	0.4	13.8
DPHE/W1/S-03	KRC 1	1.52	1.52	0.6	14.1
DPHE/W1/S-04	KRC 2	1.75	1.61	0.4	13.3
DPHE/W1/S-05	Camp 8W	1.92	1.68	0.7	16.7
Bangladesh Standard		*NYS	NYS	NYS	NYS
Reference Level (China)		1.25	2	NYS	24.6

NYS= Not yet set

134 The level of nitrogen, Phosphate and Organic Matter were within the reference value (China). The soils range from clay to clayey loam on level ground and from sandy loam to coarse sand on hilly land. In the forest areas, the clayey and sandy loams are fertile, and the sandy soil is often infused with iron, resulting in a red or yellowish tinge. The hilly soils developed from unconsolidated rocks are moderately well to excessively well drained, generally deep, and probably the oldest soils in this region, while those occurring on hills from consolidated rocks tend to be fanned in weathered sandstones, shale, and siltstone. The soils developing from the weathered sandstone tend to be sandy loams to clay loams, and those in shales silty clay loams. Generally, the soils of Tipam Surma formations are less acidic in reaction relative to the soils of Dupitila formation.

135 Polythene sheets, synthetic ropes and nails are currently being used to make shelters for the Rohingya, and these are a source of soil pollution. Other sources of pollution are: plastic bags used for packaging relief items; polythene bags used for the distribution of cooked food for children and newcomers;

plastic bottles, and used torch batteries. A proper system of waste disposal needs to be in place for these materials. Drainage systems blocked by polythene bags have been identified as a major cause of flooding in Bangladesh during the monsoon season.

5.4 TREE PLANTATION PROGRAMME

136 Due to implementation of Emergency Assistance Project, habitats of flora and fauna might be disturbed, therefore, provision for plantation is kept in the contract for all the components and this would help to conserve resources, prevent soil erosion, enhance air and water quality, sequestration of carbon and conservation of biodiversity.

5.4.1 LGED Component

137 During 4th monitoring period, tree plantation is being carried out along storm water drainage canals in both LGED/20 and LGED/21 packages (**Figure 12**). The key objectives of this plantation are to stabilize the canal embankment, reduce risk of soil erosion and landslide, and improve biodiversity. Several observations on the plantation activity are:

- Plantation programme is undertaken without plantation plan;
- Species identification is not done properly, consequently some invasive species have been planted;
- Quantities of tree species are not evenly distributed;
- Most of the saplings is less than 1 meter in height;
- Significant number of trees are found dead; and
- Weeding schedule is not prepared yet;

138 Special attention should be paid to the tree plantation plan covering selection of tree species, proper distribution of the species, plantation technique and after care of the planted saplings so that plantation to be successful and helpful in preventing soil erosion and restoration of biodiversity as well. In view of this, a detailed tree plantation programme is asked from the contractor to be prepared in line with the plantation plan and guideline is provided in the IEE.

5.4.2 DPHE Component

139 Plantation has been done by the contractor in the mini pipe water supply package under DPHE component (DPHE/W2) where more than 100 saplings of various species such as Garjan, Telsur, Jhaw, Neem etc. were planted in 10 schemes inaugurated by the ADB' Vice-President on 5 March 2020 (**Figure 12**). The plantation will contribute to land stabilization, reduce risk of land slide, improve watershed, enrich micro-climatic condition. In addition, the planted native species will also enrich the ecosystem by providing food and shelter to wildlife and other microorganism, improving overall goods and services can attain from the ecosystem. However, contractor will responsible for the after care of the sampling and payment is to be made only when trees are fully grown.



LGED/W20



LGED/W21



DPHE/W2



DPHE/W2

Figure 12 Tree plantation programme in the project sites

5.4.3 RHD Component

140 Compensatory plantation programme to be done by RHD for the loss of 468 no. of trees due to the implementation of the Improvement of National Highway (N1) From Link Road (Cox's Bazar) To Teknaf under Emergency Assistance Project. This plantation is for environmental, landscape and for aesthetic purposes.

141 Arboriculture unit under RHD have their own nurseries to produce saplings which will be used in this project. The saplings will be planted along the highways, however, there will be two rows of plantations on both sides of the road. The first row would be 1000 mm from the end of the slope, and the distance between rows of trees would be 2000 mm.

142 In the event of an unforeseen rise in the number of deaths of COVID-19, tree planting may take place by July ~ August of this rainy season, in a tentative changed program.

143 Maintenance of the trees will be made for two years, where the health, vigor and compatibility of vegetation with the environment and damage from insects and diseases right from the time of planting will be conserved. On premature death of any plant, new plant will be planted. One gardener will be employed for per km maintenance. RHD will bear all the expenses incurred for it.

5.5 TRAINING, AWARENESS AND WORKSHOP

144 Onsite trainings and meetings with contractors and EAs were conducted during the current monitoring period. Due to accessibility issues attributed to restrictions associated with Covid-19, less number of onsite training is conducted than last monitoring period. However, the site-based trainings were arranged by the environmental specialists to sensitize the contractors on implementing the environmental safeguards according to the EMPs and other contracts. A total 7 onsite trainings were arranged during January- June 2020 where total 73 participants were attended. Environmental specialists have given a brief lecture to the participants majorly focused on: occupational health and safety including PPEs, safety signage, housekeeping, waste management, management of hazardous materials, emergency procedures. Moreover, explained about the standard procedure for COVID-19 at the site. However, all the participants hold a very positive attitude towards the training program. Details of the monitoring visits are given in **Table 21** below. Photographs of onsite trainings are in **Figure 13**.

Table 21 Environmental safeguards training conducted during January- June 2020

Onsite Training and No. of Participant				Total
BREB	DPHE	LGED	RHD	
2	1	2	1	7
5	6	42	20	73

145 Besides trainings, regular meetings with EAs were conducted on frequent basis to better coordinate with all the EAs. To date 24 meetings have been conducted. **Table 22** below represents the breakdown of meetings carried out by the environmental specialists.

Table 22 Meeting held on environmental safeguards implementation during January- June 2020

Meeting with EAs				Total
BREB	DPHE	LGED	RHD	
3	9	7	5	24



Figure 13 Trainings conducted during monitoring visits

146 A progress review workshop on Emergency Assistance Project was organized on 26 January 2020 at BRM where all PMUs, ADB Safeguards Team (Environment, Social and Gender), ADB' PMO and TA Consultants were participated to discuss on undissolved issues and come up to a common decision (**Figure 14**).

147 However, Dr. Farhat Jahan Chowdhury, Senior Project Officer (Environment) delivered a presentation on environmental safeguard implementation titled "Strong Monitoring and Weak Implementation" where she highlighted (i) status on environmental safeguards in EAP, (ii) challenges in implementing safeguards including update on ECC for all components, status of GRM, unavailability of project information for safeguard documentation, corrective action plan and EMR from the PMUs etc. Several decisions were come up from the EAs on ECC, EMR, CAP during discussion session.



Figure 14 Progress review workshop at BRM

5.6 ENVIRONMENTAL ISSUES OF THE CURRENT PROJECT

148 Until date a few numbers of environmental issues have ben encountered or identified to be affecting project design. **Table 23** represents the environmental issues, recommendations and measures taken.

149 Summary of Key Issues Identified are:

- Site specific EMP yet to be submitted by the contractors;
- Reporting on environmental monitoring is inadequate;
- Environmental quality monitoring is pending to date except DPHE components;
- Lack of supervision and appropriate planning for tree plantation programme;
- Waterlogging problems due to project implementation at several sites in the project area;
- Inadequate environmental protection measures for both batching plant and hot mix plant;
- Lack of proper solid waste management system;
- Dust pollution resulting from construction work and irregular watering;
- Lack of proper management for hazardous materials;
- Lack of proper PPEs;
- No site has the EHS professional;
- Insufficient safety measures for COVID-19 in both camps and construction sites;
- Consideration of community health and safety is minimal; and
- No site has proper emergency procedure.

150 **Figure 15** later represents some currents safeguards photographs from various sites taken during field visits.

Table 23 Environmental Status of the subproject, issues and recommendation

Package	Monitoring visits	Trainings conducted	Major issues identified during 3rd monitoring period (July-Dec 19)	Issues addressed during 4th monitoring period (Jan-Jun 20)	New Issues identified during 4th monitoring period (Jan-Jun 20)	Comments
DPHE W1	1		<ul style="list-style-type: none"> Health and safety plan is prepared and started to implement in the site. Onsite training is carried out to educate the contractor staffs and workers in regard to environment, health and safety management. Contractor has already prepared the TOR to appoint sub-contractor to carry out environmental monitoring survey. PPEs are partially addressed. Boundary fencing partially implemented to control the unauthorized entry in the site. Toolbox meeting is still not being held at any site. Emergency procedure was not followed at site. 	<ul style="list-style-type: none"> Environmental monitoring for construction phase is under process. PPEs are partially implemented; Waste bins are placed in the sites to manage the waste. Fuel storage is confined and sand is kept along the fuel drums as absorbent. Site safety signs are placed. Fire protection is available at the site. First aid box is available at the site. Most of labor employed by the Contractor are locals, and their living conditions have been improved. 	<ul style="list-style-type: none"> Environmental quality monitoring (air, noise, surface water and groundwater) for construction phase has been carried out by the contractor in March 2020 in accordance to the EMP. Boundary fencing for the pump house and solar panel is yet to construct, unauthorized entry in the site was seen. No safety measures were taken for working at height. Access road damaged due to laying of pipe line is not rehabilitated properly. Drainage congestion was observed at the outlet for tap stand in KRC. 	<p>Construction work is almost completed. Site to be reinstated properly.</p>
DPHE W2	7		<ul style="list-style-type: none"> Health and safety plan is prepared and started to implement in the site. Onsite training is carried out to educate the contractor staffs and workers in regard to environment, health and safety management. Environmental quality monitoring (air, noise, surface water and groundwater) for construction has been carried out by the contractor on 2-3 October 2019 in accordance to the EMP. Monitoring report has been submitted. PPEs were partially implemented at site. Contractor supplied the ear plugs to the labors who were working close to the noise source. Drainage congestion was observed along the work place. The construction site was partially confined, unauthorized entry observed. 	<ul style="list-style-type: none"> Housekeeping is partially addressed. Separate garbage bins were supplied for organic and inorganic wastes at the site. Standard ladder was provided to work at height. Signboards with safety warning is installed at the site. PPEs were fully implemented at site. First aid box is available at the site. Fuel storage is confined and sand is kept along the fuel drums as absorbent. Emergency contact information is disseminated in the site. Toolbox meeting is being conducted regularly. Most of labor employed by the Contractor are locals, and their living conditions have been improved. 	<ul style="list-style-type: none"> Environmental quality monitoring (air, noise, surface water and groundwater) for operation phase has been carried out by the contractor on 20 January 2020 in accordance to the EMP. Monitoring report has been submitted by the contractor. Site reinstatement is done. Pump house and solar panel site is confined by fencing. Tree plantation completed along pump house. Some invasive species were selected primarily but native species are planted on later stage. 	<p>Construction completed and handed over to the camp management; O&M for two years.</p>

Package	Monitoring visits	Trainings conducted	Major issues identified during 3rd monitoring period (July-Dec 19)	Issues addressed during 4th monitoring period (Jan-Jun 20)	New Issues identified during 4th monitoring period (Jan-Jun 20)	Comments
DPHE W3	3		<ul style="list-style-type: none"> Health and safety plan is prepared and started to implement in the site. Onsite training is carried out to educate the contractor staffs and workers in regard to environment, health and safety management. Contractor has already prepared the TOR to appoint sub-contractor to carry out environmental monitoring survey. No site safety signboards are placed in the site. The construction site was confined but unauthorized access specially children were observed inside the active working site. No fire protection is found in the site. Emergency procedure was not followed at site. Drainage congestion was observed along the work place. 	<ul style="list-style-type: none"> Health and safety plan is partially followed. PPEs are partially implemented in the site. Planning to start for EQM survey for construction period asap. Site safety signs are placed at the construction site. Fuel storage is designated in the site. Waste bins are placed in the sites to manage the waste. First aid box is readily available at the site. Most of labor employed by the Contractor are locals, and their living conditions have been improved. 	<ul style="list-style-type: none"> Environmental quality monitoring (air, noise, surface water and groundwater) for construction phase has been carried out by the contractor in January 2020 in accordance to the EMP. Monitoring report has been submitted by the contractor. Pump house constructed at the low laying area which might create waterlogging problems. Water storage tanks are kept on the access road created disturbance to the passerby. No safety measures were taken for working at height. Foundation pits of pump house and solar panel were not covered properly. 	<p>Contractor to needs to implement the Health and Safety plan to improve their construction practice.</p>
DPHE W4	2		<ul style="list-style-type: none"> Health and safety plan is prepared and started to implement in the site. Onsite training is carried out to educate the contractor staffs and workers in regard to environment, health and safety management. Contractor has already prepared the TOR to appoint sub-contractor to carry out environmental monitoring survey. The fuel storage is not confined and open burning was found along the fuel drums where accident may occur at any time. No safety measures were taken for working at height. No fire protection is found in the site. Emergency procedure was not followed at site. 	<ul style="list-style-type: none"> Discussion was held to conduct environmental monitoring survey for construction phase. Fuel drums were stored in the vicinity of drainage channel which may pollute the surface water. Waste bins are placed in the sites to manage the waste. PPEs are partially implemented in the site. First aid box is available at the site. Site safety signboards are placed in the site. Most of labor employed by the Contractor are locals, and their living conditions have been improved. 	<ul style="list-style-type: none"> Environmental quality monitoring survey but yet to do. Labor were seen without PPEs at the excavation site. Socio-economical disturbance happened due to water distribution network works. Pump house constructed on the natural drainage canal which might create waterlogging problems. No safety measures were taken for working at height. Toolbox meeting is still not being held at any site. 	<p>Contractor to needs to implement the Health and Safety plan to improve their construction practice.</p>
DPHE W5	2		<ul style="list-style-type: none"> TOR prepared for environmental monitoring by the contractor. No waste management facility is seen in the site for both construction and domestic wastes. 	<ul style="list-style-type: none"> Health and safety plan is prepared and started to implement in the site. Onsite training is carried out to educate the contractor staffs and workers in regard to environment, health and safety management. 	<ul style="list-style-type: none"> Environmental quality monitoring (air, noise, surface water and groundwater) for construction phase has been carried out by the contractor in January 2020 in accordance to the EMP. 	<p>Contractor to needs to implement the Health and Safety plan to improve their construction practice.</p>

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Package	Monitoring visits	Trainings conducted	Major issues identified during 3rd monitoring period (July-Dec 19)	Issues addressed during 4 th monitoring period (Jan-Jun 20)	New Issues identified during 4 th monitoring period (Jan-Jun 20)	Comments
			<ul style="list-style-type: none"> Oil/fuel barrels were found in open in scattered way. Site safety signs are absent in the site. PPEs are partially implemented. No first aid box is available at the site. No fire protection was found. Emergency procedure was not followed at site. No tool box meeting was conducted at site to educate the workers. 	<ul style="list-style-type: none"> Waste bins are placed in the sites to manage the waste. PPEs are partially implemented in the site. First aid box is readily available at the site. Site safety signboards are placed in the site. Construction site was confined by fencing. 	<ul style="list-style-type: none"> The construction site was confined but unauthorized access specially children were observed inside the active working site. No safety measures were taken for working at height. No fire protection is found in the site. Emergency procedure was not followed at site. Foundation pits of pump house and solar panel were not covered properly. 	<p>construction practice.</p>
DPHE W10	3	1	<p>Construction work has been started from 1st quarter of 2020.</p>	<ul style="list-style-type: none"> Environmental quality monitoring (air, noise, surface water and groundwater) for pre-construction phase has been carried out by the contractor on 20 January 2020 in accordance to the EMP. Monitoring report has been submitted. Construction site is not confined and children were observed in the active working site. Health and safety measures are not followed for the labors; they work in the site without PPEs. Site safety signage are absent in the site. Waste management measures are not followed for construction waste in the site. Drainage congestion occurred in the working site. No protection was taken for site excavation site more than 2m in depth. No first aid box is available at the site. No fire protection was found. No tool box meeting was conducted at site to educate the workers. 	<p>Not enough time to analyze the issues.</p>	<p>Contractor needs more focused on OHS training, waste management and pollution control.</p>

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Package	Monitoring visits	Trainings conducted	Major issues identified during 3rd monitoring period (July-Dec 19)	Issues addressed during 4 th monitoring period (Jan-Jun 20)	New Issues identified during 4 th monitoring period (Jan-Jun 20)	Comments
				<ul style="list-style-type: none"> Emergency procedure was not followed at site. Safety protocol for COVID-19 is not followed in the site. 		
DPHE W9A	1		Construction work was not started during this period.	<ul style="list-style-type: none"> Contractor mobilized to the site recently. Construction site is demarcated on the hill top which might be changed. 	Not enough time to analyze the issues.	Environmental monitoring for pre-construction should be done asap.
DPHE W9B	1		Construction work has been started from 1 st quarter of 2020.	<ul style="list-style-type: none"> Construction site is deviated from the design location, shifted to the hilltop which is prone to landslide and has been razed without protection measures. Discussion is underway to resolve this issue. Construction site is confined but unauthorized entry was observed in the active working site. Drainage facility for storm water runoff is not adequate where gully erosion is seen. Slope protection measure should be taken immediately. Waste management measures are not followed especially for construction wastes at the site. Environmental quality monitoring for pre-construction stage is not conducted yet. Fuel storage is not confined and kept the drums along the kitchen. Moreover, no fire protection is arranged for fire incident. Health and safety measures are not followed work in the construction site; labors found to work without PPEs. Safety protocol for COVID-19 is not followed at the site. No safety signage is placed in the site. No first aid box is available at the site. Tool box meeting was not conducted at site to educate the workers. 	Not enough time to analyze the issues.	Contractor needs more focused on OHS training, slope protection, waste management and pollution control.

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Package	Monitoring visits	Trainings conducted	Major issues identified during 3rd monitoring period (July-Dec 19)	Issues addressed during 4th monitoring period (Jan-Jun 20)	New Issues identified during 4th monitoring period (Jan-Jun 20)	Comments
Construction is completed and the work site is reinstated prior to leaving the construction site.						
DPHE G1, W13, W14 and W15	20	1				
Total DPHE	8	1				
LGED W8			<ul style="list-style-type: none"> Drainage congestion was observed in Tutubill GPS where storm water is stagnant in the construction site. Due to absence of housekeeping, construction wastes were scattered around the work site. Labors worked without proper safety gears and no standard ladder is provided where they were working at height without any fall protection. Major/minor accident happened at the site but no accident report is prepared and submitted. Emergency procedure for accident, fire incident is not maintained at the site. 	<ul style="list-style-type: none"> Health and safety plan is partially followed. PPEs partially addressed. Excess earth material has been removed from the school playground located outside of the construction yard. Water is spraying regularly to suppress the dust. Site safety signs are placed at different locations in the site. Gas cylinders are supplied to the labor shed for cooking to avoid tree cutting. The sediment pond is confined by safety tape. Sanitation facility for the labors is ensured at all the construction sites. First aid box is readily available at the site. 	<ul style="list-style-type: none"> No waste management facility built in the site where wastes are burnt in the open area. Drainage congestion was occurred following moderate to heavy rainfall in the site. Water clogged in the water reservoir at ground floor might be source of mosquitoes. Due to lack of respiratory protection, workers were affected by dust particles during unloading cement bags from the truck. Fall protection for working at height is not available in the site. Electrical outlets were found in the active work site without any protection. 	<ul style="list-style-type: none"> Contractor needs to implement the Health and Safety plan to improve their construction practice.
LGED W6	2	1	<ul style="list-style-type: none"> Water supply system to the school building has been disrupted for 5 months due to construction work. As a result, sanitation facility is also being affected in the school. Students are observed to enter into the work site for water collection. Labors worked without proper safety gears and no standard ladder is provided to them where they were working at height without any fall protection. Hazardous materials including fuel drums are stored in the labor shed where no fire extinguisher is kept to put out the fire. No electric safety was ensured in the site where electric wire was found in water which might cause accident. 	<ul style="list-style-type: none"> Water supply system to the school building has been restored. Health and safety plan is partially followed in the site. Onsite training is carried out to educate the contractor staffs and workers in regard to environment, health and safety management. Worker behavior using PPEs is being improved at the site where most of the labors use their safety gears during monitoring visit. Housekeeping has been started at the site where labors were found to clear the work site. Site safety signboards were placed at the site. First aid box is readily available at the site. 	<ul style="list-style-type: none"> Waste management facility should be ensured for both construction and domestic wastes. Currently kitchen waste is dumped openly at nearby the agricultural land. Drainage congestion is still persisting in the construction site. Labor accommodation facility should be improved along proper ventilation system. Fire protection measures should be arranged immediately in the fuel storage site. Emergency procedure is not followed. 	<ul style="list-style-type: none"> Contractor needs to implement the Health and Safety plan to improve their construction practice.

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Package	Monitoring visits	Trainings conducted	Major issues identified during 3rd monitoring period (July-Dec 19)	Issues addressed during 4 th monitoring period (Jan-Jun 20)	New Issues identified during 4 th monitoring period (Jan-Jun 20)	Comments
LGED W9	2		<ul style="list-style-type: none"> Waste management is still absent in the site. Solid wastes including construction wastes were dumped openly adjacent to the labor camp. Labors worked without proper safety gears and no standard ladder is provided to them where they were working at height without fall protection. Emergency procedure is still not followed. Labor shed is still not relocated from the school building. Tool box meeting is not conducted at site to educate the workers. 	<ul style="list-style-type: none"> Health and safety plan is not followed at the site. Housekeeping is partially implemented. Construction wastes were collected and stored in the designated location. Site safety signboards are placed. PPEs partially addressed. First aid box is readily available at the site. Gas cylinder is supplied to the worker shed as cooking fuel. 	<ul style="list-style-type: none"> Waterlogging problems due to changes of stream flow happened along the cyclone shelter causes disturbance to the local community. Discussion is underway to resolve the waterlogging problems. Labor shed is still not relocated from the school building. Waste management facility should be ensured for kitchen wastes which is dumped openly at nearby private land. PPEs are yet to be properly implemented. National labor standard was not followed in the work site. Emergency procedure is not followed. 	<p>Contractor needs more focused on OHS training, slope protection, waste management and pollution control.</p>
LGED W19	5		Construction is completed and the work site is reinstated prior to handed over to WFP.			
LGED W3	5	1	<ul style="list-style-type: none"> Dust resulting from construction work. Road safety signs are yet to be installed. Construction materials are stored on the road causes traffic congestion. No safety signboards are placed at the camp site and security personnel is not deployed yet in the camp. No first aid box was found in the construction site. National labor standard is still not followed in the work site. Tool box meeting is not conducted at site to educate the workers. Emergency procedure for accident, fire incident is not maintained at the site. 	<ul style="list-style-type: none"> Health and safety plan is followed partially. Workers are supplied PPEs. Onsite training is carried out to educate the contractor staffs and workers in regard to environment, health and safety management. Road safety measures are partially addressed. Road detour, caution tape, cone etc. are used to control traffic during construction period. First aid box is available at the camp office. Gas cylinder is supplied to the worker shed as cooking fuel. 	<ul style="list-style-type: none"> Site specific EMP yet to be prepared by contractor and approved by the PD. Monthly monitoring checklist yet to be submitted by contractor to DMSC. Camp management is not up to the mark. Labor shed is built without proper ventilation system where kitchen was built inside the shed which increase the temperature and make the shed intolerable. Severe dust pollution is being occurred due to lack of dust suppression measure. The green 	<p>Contractor needs to implement the Health and Safety plan to improve their construction practice.</p>

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Package	Monitoring visits	Trainings conducted	Major issues identified during 3rd monitoring period (July-Dec 19)	Issues addressed during 4th monitoring period (Jan-Jun 20)	New Issues identified during 4th monitoring period (Jan-Jun 20)	Comments
LGED W5	4		<ul style="list-style-type: none"> Dust is being occurred due to irregular dust suppression measure. NOC from Forest Department has not been obtained yet which may result in stoppage of the Works. Road safety signs are yet to be installed. Emergency procedure for accident, fire incident is not maintained at the site. Tool box meeting is not conducted at site to educate the workers. 	<ul style="list-style-type: none"> Health and safety plan is prepared and partially followed. Onsite training is carried out to educate the contractor staffs and workers in regard to environment, health and safety management. PPEs partially implemented. First aid box is available at the camp office. Road safety signboards are placed at some places along the road. Measures are taken for cross drainage facility during construction. Awareness for biodiversity protection has been arranged at the camp site. 	<ul style="list-style-type: none"> trees along the road turned into red due to dust. No waste management is observed at the site where both domestic and construction wastes are dumped openly. Tree plantation plan should be prepared for compensatory plantation and submit to ADB safeguard team prior to commencing plantation. Emergency procedure is not followed at site. 	<p>Contractor needs more focused on OHS training, road safety, slope protection, biodiversity management and pollution control.</p>
LGED W20 and W21	9	1	Construction work has been started at the end of 3 rd monitoring period, thus environmental monitoring for these packages is commenced from 4 th monitoring period.	<p>Issues identified during 4th EMR period-</p> <ul style="list-style-type: none"> Site specific EMP yet to be generated by contractor and approved by the PD. 	<p>Issues addressed-</p> <ul style="list-style-type: none"> Necessary permission from the RRRC has been obtained to work inside the camps. 	<p>Contractor needs more focused on OHS training, slope protection,</p>

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Fourth Semi-annual Environmental Monitoring Report (January – June 2020)

Package	Monitoring visits	Trainings conducted	Major issues identified during 3rd monitoring period (July-Dec 19)	Issues addressed during 4 th monitoring period (Jan-Jun 20)	New Issues identified during 4 th monitoring period (Jan-Jun 20)	Comments
				<ul style="list-style-type: none"> Necessary permission from the RRRC through the CICs has to be kept for legal safety and readily available at the site office. Environmental Expert for implementation of EMP yet to be deployed by the contractor. Monthly monitoring checklist yet to be submitted by contractor. Embankment of the storm drainage canals need extensive erosion preventive plantation and grass turfing which to be started during rainy season. Proper waste management yet to be implemented. Dust pollution occurred severely due to lack of adequate watering measure. Heavy drainage congestion is occurred due to lack of storm drainage system in the camp area. Excavated spoils from the drainage canal is stockpiled on the bank which affected the field crops in adjacent areas. Health and safety plan should be prepared and implement at working site strictly. Labors were observed to work without PPEs at the construction site. Canal excavation was undertaken along the densely populate area without signalman which may result in a fatal accident. No proper egress and ingress is ensured at the construction site. Construction vesicles were moving without audible back-up alarms which resulted an accident at the construction camp. Construction camp is not managed satisfactorily where no boundary fence with security is observed. Moreover, a 	<ul style="list-style-type: none"> Without submitting tree plantation programme, plantation has been started recently in the embankment to prevent soil erosion and biodiversity protection. Discussion is underway for the plantation plan. Excavated spoils are removed from the cultivated land. Health and safety plan is provided to the contractor which is partially followed at site. PPEs are partially addressed. Onsite training is carried out to educate the contractor' staffs and workers in regard to environment, health and safety management. Sanitation facility is improved in the camp site. Site safety signage is placed in the camp site. Signalman is posted at the excavation site. Temporary labor shed built from plastic sheet has been removed and proper accommodation facility is arranged for the labors. First aid box is supplied with readily available accessories at the camp office. 	waste management and pollution control.

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Package	Monitoring visits	Trainings conducted	Major issues identified during 3rd monitoring period (July-Dec 19)	Issues addressed during 4th monitoring period (Jan-Jun 20)	New Issues identified during 4th monitoring period (Jan-Jun 20)	Comments
				<p>labor shed is built using plastic sheet without any ventilation system where 10-15 people are accommodated. Kitchen facility was found inside the shed which increased the room temperature.</p> <ul style="list-style-type: none"> No sanitation facility was arranged in the site where female worker was observed. Worksites are to be equipped with safety signs. No first aid box was found in the construction site. Emergency procedure for accident, fire incident is not maintained at the site. 		
LGED W4C	1		<p>Construction work has been started from 1st quarter of 2020.</p>	<ul style="list-style-type: none"> Construction has been commenced recently. Site specific EMP yet to be generated by contractor and approved by the PD. Monthly monitoring checklist yet to be submitted by contractor. Proper waste management yet to be implemented. Health and safety plan should be prepared and implement at working site strictly. Access disturbance to the local community is occurred since no alternative route is being designated during construction activity. No road safety measure is followed at site. PPEs are partially implemented in the working site. Appropriate safety signs to be placed in the site. No first aid box is available at the site. Tool box meeting is not conducted at site to educate the workers. Emergency procedure for accident, fire incident is not maintained at the site. 	<p>Not enough time to analyze the issues.</p>	<p>Contractor needs more focused on OHS training, slope protection, waste management and pollution control.</p>

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Package	Monitoring visits	Trainings conducted	Major issues identified during 3rd monitoring period (July-Dec 19)	Issues addressed during 4 th monitoring period (Jan-Jun 20)	New Issues identified during 4 th monitoring period (Jan-Jun 20)	Comments
LGED W1B	3		Construction work has been started from 1 st quarter of 2020.	<ul style="list-style-type: none"> Construction has been commenced recently. Site specific EMP yet to be generated by contractor and approved by the PD. Environmental Expert for implementation of EMP yet to be deployed by the contractor. Monthly monitoring checklist yet to be submitted by contractor. Health and safety plan should be prepared and implement at working site strictly. Access disturbance to the local community is occurred since no alternative route is being designated during construction activity. No road safety measure is followed at site. National labor standard was not followed to hire work force. PPEs are partially implemented in the working site. Appropriate safety signs to be placed in the site. Construction camp is confined and secured by boundary fencing. Proper waste management yet to be implemented in the camp site. No first aid box is available at the site. Tool box meeting is not conducted at site to educate the workers. Emergency procedure for accident, fire incident is not maintained at the site. 	Not enough time to analyze the issues.	Contractor needs more focused on OHS training, slope protection, waste management and pollution control.
Total LGED	39	3				
RHD W1	7	1	<ul style="list-style-type: none"> Draft tree plantation program is prepared which needs to be updated. Contractor should prepare and submit the environmental report on a monthly basis. Waste water management plan for concrete batching plant to be prepared and implement strictly. 	<ul style="list-style-type: none"> Monthly monitoring report along with monitoring checklist is submitted to DMSC and PMU. Discussion is underway to engage third party organization for carrying out environmental monitoring survey. Health and safety plan is supplied and addressed partially at the site. 	<ul style="list-style-type: none"> Site specific EMP yet to be formulated by the contractor. Environmental Expert for implementation of EMP yet to be deployed by the contractor. Environmental quality monitoring for 1st and 2nd quarter of 2020 is not conducted yet. 	Contractor needs more focused on OHS management and training, waste management, management of

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Package	Monitoring visits	Trainings conducted	Major issues identified during 3rd monitoring period (July-Dec 19)	Issues addressed during 4 th monitoring period (Jan-Jun 20)	New Issues identified during 4 th monitoring period (Jan-Jun 20)	Comments
			<ul style="list-style-type: none"> • Proper waste management yet to be implemented. • Fuel storage should be confined and established away from haulage and water body. • Dust pollution occurred severely due to lack of adequate dust suppression measure. • Hearing protection must be ensured for the workers who operate hydraulic compressor. • Heavy drainage congestion is occurred due to lack of storm drainage system in the camp area and along the road, consequently the road was being damaged. • PPEs are yet to be properly implemented. • Safety signboard is absent at the camp and work sites. • Proper lighting is absent during night shift at the site. • National labor standard was not followed in the work site. • No first aid box is available at the site. • No fire protection was found. • Tool box meeting is not conducted at site to educate the workers. • Emergency procedure for accident, fire incident is not maintained at the site. 	<ul style="list-style-type: none"> • Onsite training is carried out to educate the contractor staffs and workers in regard to environment, health and safety management. • Tree plantation to be started by RHD Arboriculture section from July-August 2020. • Traffic management plan prepared by contractor and implemented at site. Warning signs and safety barrier is used at the road diversion section for traffic safety. • Dust suppression measures are followed at site and a log-sheet yet to be submitted by the contractor. • Sanitation facility is improved in the camp site. • Housekeeping is partially addressed during 4th EMR period. • PPEs are partially addressed. • Adequate lighting is ensured at the site during night shift. • Road safety measures are partially addressed. • Fire protection is preserved at fuel storage site. • First aid box is readily available at the camp office. 	<ul style="list-style-type: none"> • Rectification report on corrective action plan sent by ABD consultant yet to be submitted. • Cutting hill slope must be stopped and should take engineering measures to avoid slope failure. • Drainage congestion is being occurred in the camp due to lack of proper drainage facility. • Waste water from batching plant is drained to the nearby private land. • Dust pollution is occurred due to operation of hot mix plant which affected surrounding environment. • Waste bins are placed in the camp site but no measures are taken to date for construction wastes management. • Fuel storage is not confined and construction vehicles are frequently moved along the fuel drums and spills from storage site contaminated adjacent private land. • Waterlogging problems happened at the road diversion site due to lack of cross drainage facility. • Health and safety plan is provided to the contractor to be fully implemented. • National labor standard was not followed in the work site. • Inventory of PPEs yet to be periodically submitted. 	<p>batching and hot mix plant and pollution control.</p>

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Package	Monitoring visits	Trainings conducted	Major issues identified during 3rd monitoring period (July-Dec 19)	Issues addressed during 4 th monitoring period (Jan-Jun 20)	New Issues identified during 4 th monitoring period (Jan-Jun 20)	Comments
RHD W2	7		<ul style="list-style-type: none"> Contractor should prepare and submit the environmental report on a monthly basis. Draft tree plantation program is prepared which needs to be updated. Waste water management plan for concrete batching plant to be prepared and implemented strictly. Proper waste management yet to be implemented. Fuel storage should be confined and established where proper safety must be ensured. Dust pollution occurred severely due to lack of adequate watering measure. Hearing protection must be ensured for the workers who operate hydraulic compressor. Heavy drainage congestion is occurred due to lack of storm drainage system in the camp area and along the road, consequently the road is being damaged. PPEs are yet to be properly implemented. Worksites are to be equipped with safety signs. Emergency procedure for accident, fire incident is not maintained at the site. Safety signboard is absent at the camp site. No first aid box is available at the site. No fire protection was found. Proper lighting is absent during night shift at the site. Tool box meeting is not conducted at site to educate the workers. National labor standard was not followed in the work site. 	<ul style="list-style-type: none"> Monthly monitoring report along with monitoring checklist is submitted to DMSC and PMU. Discussion is underway to engage third party organization for carrying out environmental monitoring survey. Health and safety plan is supplied and addressed partially at the site. Onsite training is carried out to educate the contractor staffs and workers in regard to environment, health and safety management. Tree plantation to be started by RHD Arboriculture section from July-August 2020. Fuel storage site is confined where safety signs as well as fire extinguisher is placed. Traffic management plan prepared by contractor and implemented at site. Warning signs, safety tape and barriers are used for traffic safety. Dust suppression measures are followed at site and a log-sheet yet to be submitted by the contractor. Sanitation facility is improved in the camp site. Housekeeping is partially addressed during 4th EMR period. PPEs are partially addressed. Adequate lighting is ensured at the site during night shift. Road safety measures are partially addressed. 	<ul style="list-style-type: none"> Emergency procedure for accident, fire incident is not maintained at the site. Safety protocol for COVID-19 to be followed strictly in both camp and working sites. Site specific EMP yet to be formulated by the contractor. Environmental Expert for implementation of EMP yet to be deployed by the contractor. Environmental quality monitoring for 1st and 2nd quarter of 2020 is not conducted yet. Rectification report on corrective action plan sent by ABD consultant yet to be submitted. Cutting hill slope must be stopped and should take engineering measures to avoid slope failure. Waste water from batching plant is drained to the road which causes waterlogging problems along the road. Dust pollution is occurred due to operation of hot mix plant which affected surrounding environment. Waste bins are placed in the camp site but no measures are taken to date for construction wastes management. Waterlogging problems happened at the road diversion site due to lack of cross drainage facility. Health and safety plan is provided to the contractor to be fully implemented. 	<ul style="list-style-type: none"> Contractor needs more focused on OHS management and training, waste management, management of batching and hot mix plant and pollution control.

Package	Monitoring visits	Trainings conducted	Major issues identified during 3rd monitoring period (July-Dec 19)	Issues addressed during 4th monitoring period (Jan-Jun 20)	New Issues identified during 4th monitoring period (Jan-Jun 20)	Comments
Total RHD	14	1				
BREB W1A	3		<ul style="list-style-type: none"> Wastewater is discharged to the cultivated land from the site which causes soil pollution and might decrease the crop production. Laborers worked without proper safety gears and no standard ladder is provided to them where they were working at height without fall protection. Site safety signs are yet to be placed. Emergency procedure is not maintained at the site. No fire protection was found in the site. 	<ul style="list-style-type: none"> Fire protection is preserved at fuel storage site. First aid box is readily available at the camp office. 	<ul style="list-style-type: none"> Inventory of PPEs yet to be periodically submitted. National labor standard was not followed in the work site. Emergency procedure for accident, fire incident is not maintained at the site. Safety protocol for COVID-19 to be followed strictly in both camp and working sites. 	Construction work is almost completed and handed over to BREB. Site to be reinstated properly.
BREB W2	1		<ul style="list-style-type: none"> NOC from Forest Department has not been obtained yet which may result in stoppage of the Works. PPEs are yet to be properly implemented. Laborers worked without proper safety gears and no standard ladder is provided to them where they were working at height without fall protection. Worksites are to be equipped with safety signs. Emergency procedure for accident, fire incident is not maintained at the site. 	<ul style="list-style-type: none"> Earthen sedimentation pond was used to collect waste water generated in the construction site. Onsite training is carried out to educate the contractor staffs and workers in regard to environment, health and safety management Housekeeping is partially implemented. PPEs are partially implemented. Safety signs are placed at the site. Fire extinguisher is placed at site to prevent fire incident. First aid box is readily available at the site. Site reinstatement is being properly conducted. Safety supervisor is designated to oversee the health and safety practices in the site. Onsite training is carried out to educate the contractor staffs and workers in regard to environment, health and safety management. Safety measures such as signboard, safety tape and barriers are placed along the working site located along the busy roadside or in the camp area. PPEs partially implemented. First aid box is available at the site. 	<ul style="list-style-type: none"> Drainage congestion is occurred due to lack of drainage facility inside the construction site. Construction wastes are scattered around the work site due to absence of housekeeping at the site. Electrical outlets are kept in the active working site without any protection measure. Emergency procedure is not followed. Failure to obtain NOC from Forest Department, construction works is being stopped for 7km of distribution line inside Teknaf Wildlife Sanctuary. Waste management for construction debris is not properly addressed. Emergency procedure is not maintained at the site. Tool box meeting is not conducted at site to educate the workers. 	Construction work is almost completed. Site to be reinstated properly.

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Package	Monitoring visits	Trainings conducted	Major issues identified during 3rd monitoring period (July-Dec 19)	Issues addressed during 4 th monitoring period (Jan-Jun 20)	New Issues identified during 4 th monitoring period (Jan-Jun 20)	Comments
BREB G5	6		<ul style="list-style-type: none"> Burrow pits left open and causing trouble for locals PPEs were absent. Excavated earth materials were left open. Site safety signs are absent in the site. No first aid box is available at the site. Tool box meeting is not conducted at site to educate the workers. Emergency procedure for accident, fire incident is not maintained at the site. 	<ul style="list-style-type: none"> Excavated spoils are stored and used in backfilling. PPEs are partially addressed. Onsite training is carried out to educate the contractor staffs and workers in regard to environment, health and safety management. First aid box is available at the site. 	<ul style="list-style-type: none"> Foundation pits of battery house and solar panel are not protected and creates social disturbance. Construction activity of battery house affected the road located adjacent to the working sites. Standard ladder to be arranged during working at height. Worksites are to be equipped with safety signs. Emergency procedure for accident, fire incident is not maintained at the site. 	Construction work is almost completed. Site to be reinstated properly.
BREB G6	2	1	Construction work has been started from 1 st quarter of 2020.	<ul style="list-style-type: none"> Training on implementation of ECoP is conducted prior to starting project construction works. Burrow pits of battery house are confined to prevent accident. Excavated spoils are stored and used in backfilling. Standard ladder to be arranged during working at height. PPEs are partially addressed. Worksites are to be equipped with safety signs. Emergency procedure for accident, fire incident is not maintained at the site. 	Not enough time to analyze the issues	Training on implementation of ECoP seems to be working.
BREB G7	2	1	Construction work has been started from 1 st quarter of 2020.	<ul style="list-style-type: none"> Training on implementation of ECoP is conducted prior to starting project construction works. Construction sites are confined using safety tapes to prevent unauthorized access. Safety signboards to be placed in the working sites. Excavated spoils are stored and used in backfilling. PPEs are partially addressed. Emergency procedure is not maintained at the site. 	Not enough time to analyze the issues.	Construction work is almost completed. Site to be reinstated properly.

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Package	Monitoring visits	Trainings conducted	Major issues identified during 3rd monitoring period (July-Dec 19)	Issues addressed during 4 th monitoring period (Jan-Jun 20)	New Issues identified during 4 th monitoring period (Jan-Jun 20)	Comments
				<ul style="list-style-type: none"> Slabs on the earthing pits are broken which to be repaired immediately. 		
BREB G1, G2A and G2B			Construction is completed and the work site is reinstated prior to leaving the construction site.			
Total BREB	14	2				
Grand total	87	7				



Figure 15 Safeguards status at various sites. Most of them found as partially to fully satisfactory

6 Performance Indicators

151 This section presents some site-based performance indicators for observe the performance of all running subprojects at a glance. The performance indicators are based on field observations from each subproject. While the Health and Safety (H&S) performances indicators are presented in **Table 24** and performance indicators in **Table 25**, some photographs of site visits where information collection through onsite training with workers were done are presented in **Figure 16**.



Figure 16 Training and information collection from various subprojects

Table 24 H&S Performance indicators of all subprojects

Environmental Safeguards Questions	DPHE								LGED								RHD		BREB			
	W1	W2	W3	W4	W5	W6	W7	W9B	W10	W1	W2	W3	W4	W1	W2	W1A	W2	G5	G6	G7		
	1	2	3	4	5	6	8	9	B	1	0	1	2	1	4	C						
1. Sensitive receptors adjacent to the site? (i.e. residential, schools/learning center, health care center, daycare...)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
2. Are the workers aware of the EMP?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
3. Occupational Health and Safety:																						
3.1 Is there a designated person responsible for ensuring safe working practices? Are the workers aware?	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N		
3.2 Have the workers received appropriate OHS training to perform their jobs? How often are they briefed on OHS requirements? *	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y		
3.3 Do the workers use personal protective equipment (PPE - hats, glasses, boots etc.)? **	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
3.4 Are working areas clear of slipping and tripping hazards?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
3.5 Are health and safety warning and information signs visible and understandable to workers?	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	Y	Y	N	N	N		
3.6 Are there any hazardous materials? Are they stored and handled appropriately?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
3.7 Are workers exposed to risks from working at height? If yes, are the workers using harnesses (fall protection equipment)?	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	Y / N	N		
3.8 Are workers exposed to risk from confined spaces? (i.e. storage areas for hazardous materials)	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
3.9 Is there a record of occupational injuries and diseases?	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
3.10 Do workers receive health checks?	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
3.11 What medical facilities are made available for the workers?	* * *	* * *	* * *	* * *	* * *	** ** **	** ** **	** ** **	* * *	** ** **	** ** **	** ** **	** ** **	** ** **	*** *** ***	*** *** ***	*** *** ***	*** *** ***	*** *** ***	*** *** ***		
Labor Camps:																						
3.12 What toilet and washing facilities are provided?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
3.13 Do workers have access to clean drinking water?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
3.14 Is the workers accommodation provided by the contractor?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Emergency Procedures:																						
3.15 Are any procedures in place in case of an injury on site?	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
3.16 Is there a first aid kit available on site?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
3.17 Are any procedures in place for chlorine leak, oil spills?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N		

Environmental Safeguards Questions	DPHE								LGED								RHD		BREB						
	W1	W2	W3	W4	W5	W6	W7	W9B	W	W3	W5	W8	W6	W9	W20	W21	W4C	W	W1	W2	W1A	W	G5	G6	G7
3.18 Is firefighting equipment available on site? Is servicing up to date?	N	Y	N	N	N	N	N	N	N	N	N	Y	Y	N	N	N	N	N	Y	Y	Y	Y	N	N	N
4. Grievance Redress Mechanism {GRM): 4.1 Are the names and contact information posted for possible complaints? 4.2 Is there a log book available on site?	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
5. House Keeping: 5.1 Did you observe examples of poor housekeeping? (i.e. empty containers scattered, stagnation of water from improper disposal of solid waste?)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	

*H&S has been briefed by the ADB consultants on site

**PPEs are partially used in all site

*** Only First Aid boxes are available on site

**** Y = Yes; N = No

Table 25 Mitigation Effectiveness rating for all subprojects (deduced from consultants' observation)

Sl. No.	Package No.	Q1 (Jul – Sep 18)	Q2 (Oct – Dec 18)	Q3 (Jan – Mar 19)	Q4 (Apr – Jun 19)	Q5 (Jul – Sep 19)	Q6 (Oct – Dec 19)	Q7 (Jan – Mar 20)	Q8 (Apr – June 20)	Overall Score
BREB										
01	EAP/BREB/G1									Construction completed
02	EAP/BREB/G2A									Construction completed
03	EAP/BREB/G2B									Construction completed
04	EAP/BREB/W1A	2	2	2	3	3	3	4	4	3
05	EAP/BREB/W2	3	3	3	3	2	3	3	4	3
06	EAP/BREB/G5						3	3	3	3
07	EAP/BREB/G6A							3	3	3
08	EAP/BREB/G6B							3	3	3
09	EAP/BREB/G7							4	4	4
DPHE										
01	EAP/DPHE/G1									Completed
02	EAP/DPHE/G2									
03	EAP/DPHE/G3									

SI. No.	Package No.	Q1 (Jul – Sep 18)	Q2 (Oct – Dec 18)	Q3 (Jan – Mar 19)	Q4 (Apr – Jun 19)	Q5 (Jul – Sep 19)	Q6 (Oct – Dec 19)	Q7 (Jan – Mar 20)	Q8 (Apr – June 20)	Overall Score
04	EAP/DPHE/G4									
05	EAP/DPHE/W1			2	3	3	3	3	3	3
06	EAP/DPHE/W2			3	4	4	5	5	5	4.3
07	EAP/DPHE/W3				3	3	3	4	4	3.5
08	EAP/DPHE/W4				2	3	3	3	3	2.8
09	EAP/DPHE/W5					2	3	4	4	3.25
10	EAP/DPHE/W9A									
11	EAP/DPHE/W9B								2	2
12	EAP/DPHE/W10							3	3	3
13	EAP/DPHE/W11									
14	EAP/DPHE/W12A									
15	EAP/DPHE/W12B									
16	EAP/DPHE/W13									
17	EAP/DPHE/W14									
18	EAP/DPHE/W15									
19	EAP/DPHE/W18									
20	EAP/DPHE/W19									
21	EAP/DPHE/CON/1									
LGED										
01	EAP/LGED/OCB-N/W6		1	2	4	3	4	4	4	3.28
02	EAP/LGED/OCB-N/W8		1	3	4	4	4	4	4	3.4
03	EAP/LGED/OCB-N/W9			1	2	3	4	4	3	2.8
04	EAP/LGED/OCB-N/W19									
05	EAP/LGED/OCB-N/W10									
06	EAP/LGED/OCB-N/W4C								3	3
07	EAP/LGED/OCB-N/W4D									
08	EAP/LGED/OCB-N/W4E									
09	EAP/LGED/OCB-N/W6A									
10	EAP/LGED/OCB-N/W20						2	3	4	3
11	EAP/LGED/OCB-N/W21						2	3	4	3
12	EAP/LGED/OCB-N/W1A									

SI. No.	Package No.	Q1 (Jul – Sep 18)	Q2 (Oct – Dec 18)	Q3 (Jan – Mar 19)	Q4 (Apr – Jun 19)	Q5 (Jul – Sep 19)	Q6 (Oct – Dec 19)	Q7 (Jan – Mar 20)	Q8 (Apr – June 20)	Overall Score
13	EAP/LGED/OCB-N/W1B							2	2	2
14	EAP/LGED/OCB-N/W2A									
15	EAP/LGED/OCB-N/W2B									
16	EAP/LGED/OCB-N/W3					2	3	3	4	3
17	EAP/LGED/OCB-N/W5					2	3	3	3	2.75
18	EAP/LGED/CON/1									
RHD										
01	EAP/RHD/W1		2	3	4	3	4	4	4	3.4
02	EAP/RHD/W2		2	3	4	3	4	4	4	3.4
03	EAP/RHD/CON/1									
Note: Mitigation Effectiveness Rating Criteria										
1		2		3		4		5		
Very poor (take very few measures)		Poor (take few measures)		Medium (take several measures)		Good (take main measures)		very good (meet all requirements)		

152 **Trend in performance:** A time trend analysis for EMP non-compliance has been studied against hands-on training provided to the workers for the time period of year 2020. It has been found that the non-compliance issue was decreasing over time with a steady input of hands-on training for workers until December 2019. Due to accessibility issues attributed to restrictions associated with Covid-19, safeguards monitoring activity has been hampered which reversed the trend and increases noncompliance issues. **Figure 17** and **Figure 18** explains the situation in detail. Given the comparative study, it can be concluded that steady and continuous training can improve the H&S situation at site and may produce better EMP compliance.

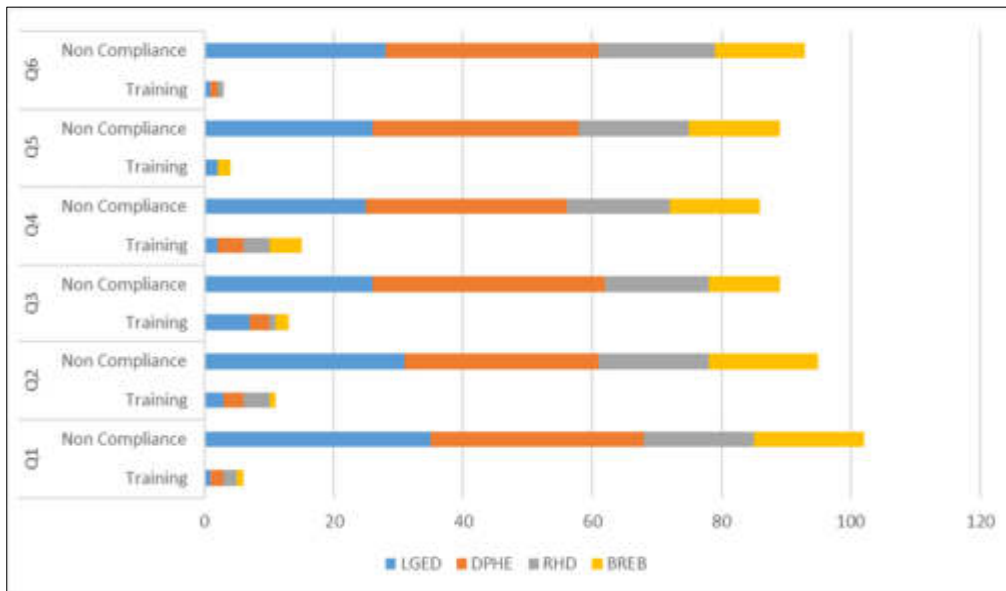


Figure 17 Training vs EMP non-compliance over time (information up to June 2020)

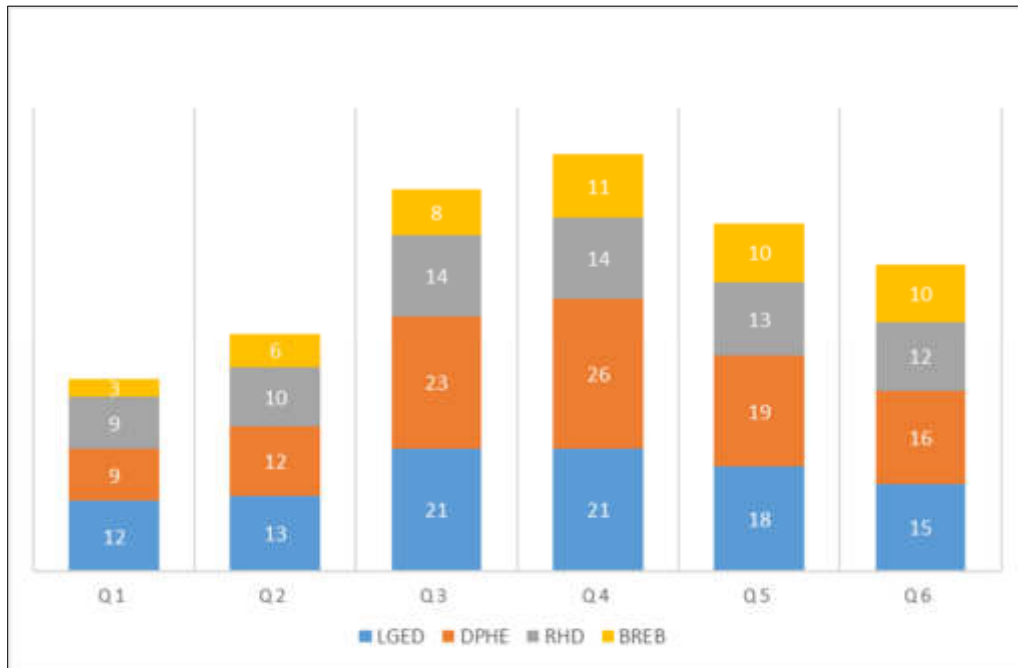


Figure 18 Number of mitigation measures taken over time

7 Concluding Observations

153 Current environmental conditions of several ongoing subprojects are presented through some site photographs in Appendix I of this report. Appendix II represents some Environmental Compliance Reports produced from site visit that are shared with the EAs and ADB for tracking and action.

154 The concluding observations are as follows:

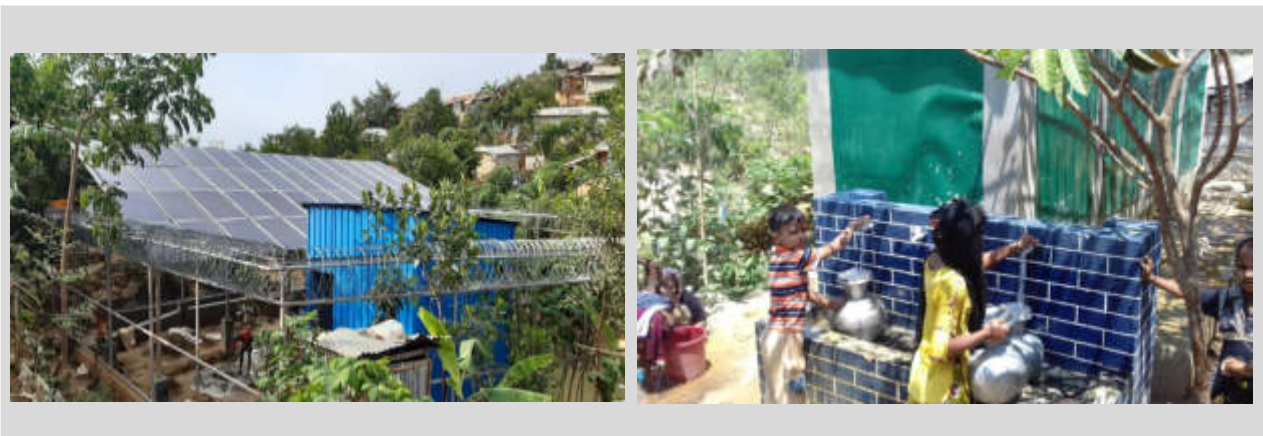
- The Environmental Safeguards compliance performance of the EAs are improving slowly but steadily. The onsite training workshop and regular monitoring of ADB to sensitize the EAs and contractors seems to have obvious impact in this regard.
- Due to accessibility issues attributed to restrictions associated with Covid-19, implementation of environmental safeguards is hindered, causes increasing trend in noncompliance issues. In addition, inadequate safety measures are arranged to encounter COVID-19 in the construction sites.
- Environmental quality data from periodic monitoring indicated that in reference to the Bangladesh standard, the quality of ambient air and groundwater in the project area is within the standard limit. The noise level is within the safe limit for mixed areas with intermittent spikes due to proximity of the sites to the roads and human interference. Furthermore, the canal water has very low amount of Dissolved Oxygen which is unfavorable for aquatic life. TDS, BOD and COD of the canal water is comparatively higher than normal surface water due to lack of proper waste management in the camps.
- When same contractor is being awarded with more than one subproject, environmental compliance record appears to be poor.
- The implementing agencies need to consult with Environmental Safeguards consultants and ADB's safeguard division while proposing the project, before going into design. In this way, if the Safeguards division and Environmental Consultants checks the environmental and other related issues, the implementing agencies can go for designing and can save time by avoiding redesign issues.
- The implementing agencies need to better coordinate with the DoE and Forest Department. It appears the level of coordination is weak.

Reporting Information:

Revision	Description	Originator	Reporting contribution
00	Fourth Semi-annual Environmental Monitoring Report (January – June 2020)	Shahid Zaman	Shahid Zaman

Appendix I: Site Photographs

1. DPHE/W1, W2, W3, W4 and W5: Mini Pipe Water Supply System





2. DPHE/W10: DEWATS



3. DPHE/W9B: Integrated Waste Management



4. LGED/W6, W8 and W9: Cyclone Shelters



5. LGED/W3, W4C and W5: Access Road



6. LGED/W20, W21: Storm Water Drainage Canal



7. LGED/W1B: Internal Road

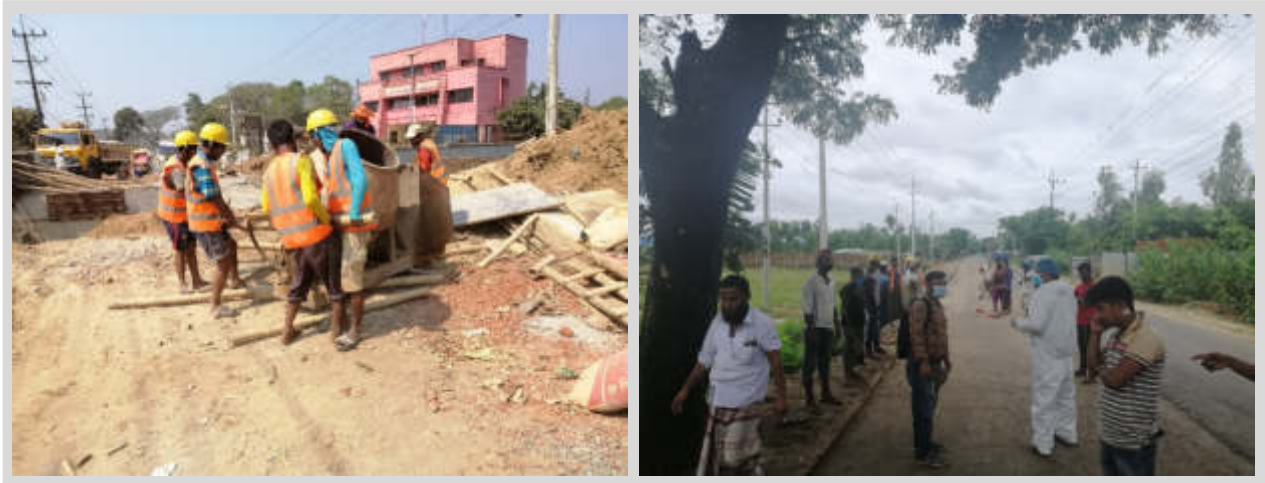


8. RHD/W1: Rehabilitation of National Highway from Link Road (Cox's Bazar) to Ukhia



9. RHD/W2: Rehabilitation of National Highway from Ukhia to Unchiprang





10. BREB/W1A: 33/11kV Electrical Sub-station



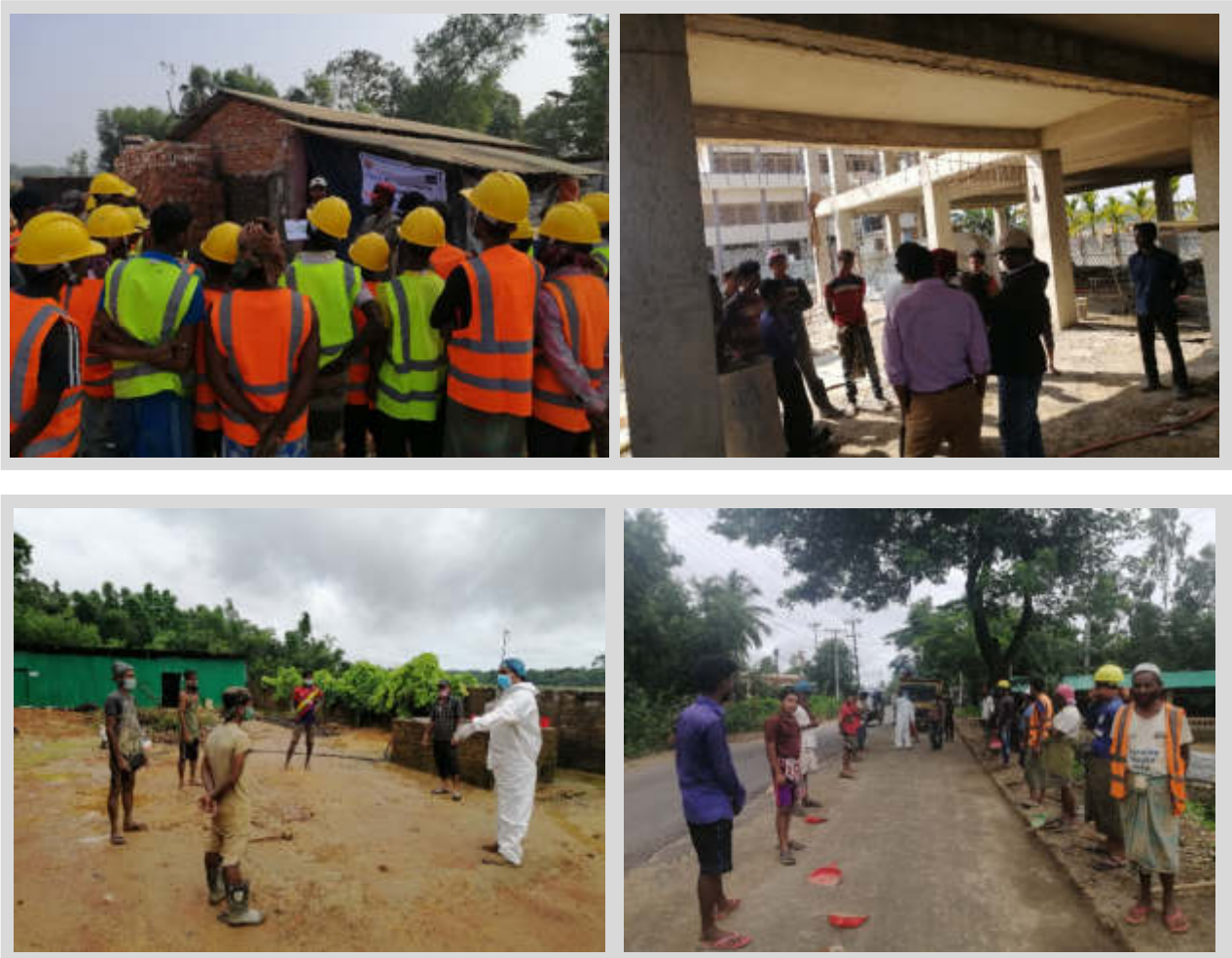
11. BREB/G5: Nano-Grid



12. BREB/G6: Nano-Grid and BREB/G7: Lightning Arrester



13. Onsite Training Program at LGED, DPHE, RHD and BREB Component









Appendix II: Sample Compliance Audit Reports




AUDIT FINDINGS (EAP/RHD/W1) February 22, 2020

The findings from the site audits and action items required to mitigate non-conformances, where required, are provided in the sub-sections below:

Issues	Observation	Corrective Action	Deadline	Responsibility	Photograph
Corrective Action Plan	EHS issues identified and reported till date by environmental specialist have not rectified yet.	Rectify all EHS issues immediately and submit the rectification report.	February 2020	Contractor and CSC	Photograph is not required.
EMP Monitoring Checklist	EMP monitoring checklist was supplied to the contractor and suggested them to submit it fortnightly but no response has been received yet from the contractor.	The monitoring checklist must be completed and submitted to review asap.	February 2020	Contractor and CSC	Photograph is not required.
Environmental Inspection and Monitoring Report	Contractor should prepare and submit the environmental report on a monthly basis but till date not a single report has been submitted.	Prepare Environmental Inspection and Monitoring report on a monthly basis.	February 2020	Contractor and CSC	Photograph is not required.
Monitoring of Environmental Parameter	In order to ensure proper implementation of the environmental safeguard requirements, the Contractor shall conduct air quality, noise measurement, surface water quality and groundwater quality testing and analysis on quarterly basis but Contractor has not conducted any environmental monitoring till date which should be done immediately.	Contractors must conduct environmental monitoring activity immediately as per EMP.	February 2020	Contractor and CSC	Photograph is not required.
H&S Plan	HSP is circulated to the contractors but it has not been implemented at the site.	CSC should supervise the contractor strictly in the implementation of the HSP properly.	February 2020	Contractor and CSC	Photograph is not required.

Issues	Observation	Corrective Action	Deadline	Responsibility	Photograph
Management of Concrete Batching Plant	Waste water from batching plant is being discharged directly to the nearby agricultural field which polluted soil as well as water.	<p>Contractor must prepare a waste water management plan and undertake the following measures:</p> <ul style="list-style-type: none"> • All runoff and wastewater is to be collected and contained onsite in a sufficiently large tank/sedimentation pit. • Wastewater to be reused as part of the dust suppression system at earliest possible opportunity to restore storage capacity. 	February 2020	Contractor and CSC	
Asphalt Mix Plant	Severe dust pollution is observed at the camp site due to the operation of asphalt plant which affected the labors and surrounding environment badly where workers were observed without dust mask, ear plug etc.	<p>Contractor should use consult with supplier regarding dust issues and also install wet scrubber or other measures to reduce the dust level in the plant site.</p> <p>Dust mask and ear plug must be provided to the labors at the plant.</p>	February 2020	Contractor and CSC	
Dust Pollution	Due to lack of spraying water on the dry road dust is generated and affected local people.	Contractor should increase the frequency of watering (at least 4 times a day) to reduce the dust level on the road (special care should be taken for the access road to the camp).	February 2020	Contractor and CSC	


Issues	Observation	Corrective Action	Deadline	Responsibility	Photograph
Road Safety and traffic management	Warning signs and safety barrier is used at the road diversion section for traffic safety.	Rectified			
Control of Petroleum Products	<ul style="list-style-type: none"> Petroleum products are stored in scattered way at different locations where no absorbent kit is kept. Storage of petroleum products is located adjacent to the batching plant where large amount of waste water generated and mixed with spillage and discharged to the cultivated land which contaminate soil as well as water. The fuel storage is not confined and mixing trucks are frequently moved along the fuel drums, therefore, accident may occur at any moment. No safety signage as well as fire extinguisher is placed at the storage area. 	<ul style="list-style-type: none"> Petroleum products must be stored in a designated storage location where any spillage can be safely maintained without contamination of the surrounding area. Spill absorbent must be kept at the refueling site. Storage should be confined and established away from haulage. Safety signs must be installed at the storage site. Fire protection measure must be arranged at storage area. 	February 2020	Contractor and CSC	




Issues	Observation	Corrective Action	Deadline	Responsibility	Photograph
Worker Health and Safety	<ul style="list-style-type: none"> • Labors were observed to work without PPEs at the site. • Labors engaged in the noisy work site (more than 95dB) without ear protection. • Workers were observed in the dusty work site without respiratory protection. • Child labors are appointed and engaged in hazardous activity without PPEs. • No health and safety checklist is followed at the work site. • No first aid box was found in the construction site. 	<ul style="list-style-type: none"> • PPEs need to be supplied to workers and enforced them to use at site. • Contractor should comply with requirements of Government of Bangladesh Labour Law of 2006 (amended in 2013). • Provide first aid facilities that are readily accessible by workers. • Contractor must conduct tool box talk regularly at each site. 	February 2020	Contractor and CSC	  




Issues	Observation	Corrective Action	Deadline	Responsibility	Photograph
Construction camp	<ul style="list-style-type: none"> Construction camp is not managed satisfactorily where no boundary fence with security is observed. No safety signs are placed in the construction camp. No housekeeping was observed there. Moreover, no waste management is found in the camp. Toilets for the labors are built without proper doors and septic tank is opened which emitted odor in the surrounding. No drainage network has been developed yet inside the camp where waste water management is not observed at all. Emergency procedure is not followed in the camp. 	<ul style="list-style-type: none"> Site safety signage must be placed at designated locations in the camp. Contractor should install garbage bins and construct a concrete waste disposal site which have the impermeable floor and wall and covered by shed to avoid air, soil and groundwater pollution. Emergency contact information should be displaced at the camp site. Sanitation facility should be improved. Drainage system must be developed inside the camp. 	February 2020	Contractor and CSC	  

AUDIT FINDINGS (EAP/LGED/W20 and W21) March 10, 2020

The findings from the site audits and action items required to mitigate non-conformances, where required, are provided in the sub-sections below:

Issues	Observation	Corrective Action	Deadline	Responsibility	Photograph
Onsite Training on EHS	Onsite training on EHS was conducted on 10 February 2020 at the construction camp located in Balukhali where 25 workers including project engineers were participated. ADB Environmental Specialist has given a brief lecture to the participants majorly focused on: occupational health and safety including PPEs, safety signage, first aid, housekeeping, waste management, management of hazardous materials, emergency procedures. Moreover, explained about the importance of regular tool box meeting at the site. However, all the participants hold a very positive attitude towards the training program.				
EHS Expert	As per contract, Contractor has to appoint an Environmental Expert for the implementation of the EMP but till date EHS expert has not been employed for the subproject.	Contractor should appoint the EHS expert immediately for proper implementation of EMP.	March 2020	Contractor	Photograph is not required.
Site Specific EMP	As per EMP, Contractor has not prepared the site specific EMP till date.	Site Specific EMP must be prepared and implement accordingly.	March 2020	Contractor and CSC	Photograph is not required.
Tree plantation plan	As per EMP, the drainage sites need extensive erosion preventive plantation and grass turfing at every erosion prone hillside.	Contractor should prepare a plan for tree plantation and grass turfing and submit to LGED and ADB.	March 2020	Contractor and CSC	Photograph is not required.
Environmental Inspection and Monitoring Report	Contractor should prepare and submit the environmental report on a monthly basis but till date not a single report has been submitted.	Prepare Environmental Inspection and Monitoring report on a monthly basis.	March 2020	Contractor and CSC	Photograph is not required.
H&S Plan	Health and safety plan has been prepared as per EMP and sent to PD-LGED and CSC to share with the Contractor which might	HSP should be circulated to the contractor asap and monitoring the implementation activity accordingly.	March 2020	LGED and CSC	Photograph is not required.


Issues	Observation	Corrective Action	Deadline	Responsibility	Photograph
	improve their construction practices but contractor has not received the plan yet.				
Permission and legal procedures	During site visit, Contractor failed to exhibit legal paper/permission taken from RRRC which is an essential document to commence work inside the camp.	Necessary permission from the RRRC through the CICs has to be kept for legal safety and readily available at the site office.	March 2020	LGED and Contractor	
Management of Excavated Spoils	Excavated spoils from the drainage canal is stockpiled on the bank which affected the field crops in adjacent areas.	A management plan for excavated spoils should be prepared by the contractor. Spoils should not be stockpiled along the agricultural field. If require, storage areas must be protected by covering.	March 2020	Contractor	
Dust pollution	Dust pollution is being occurred severely due to lack of dust suppression measure.	Contractor should spray water regularly on the open and loose surface of the stream bank.	March 2020	Contractor	

Issues	Observation	Corrective Action	Deadline	Responsibility	Photograph
Worker health and safety	<ul style="list-style-type: none"> Construction vehicles were moving without audible back-up alarms which resulted in an accident at the construction camp during site inspection. Canal excavation was undertaken along the densely populated area without signalman which may result in a fatal accident. Labors were observed to work without PPEs at the construction camp. No first aid box was found in the construction site. No proper egress and ingress is ensured at the construction site. No sanitation facility was arranged in the site where female worker was observed. Workers were observed in the dusty work site without respiratory protection. 	<ul style="list-style-type: none"> Construction should ensure moving equipment is outfitted with audible back-up alarms. Signal-man should be assigned for each excavator during excavation. PPEs need to be supplied to workers and enforced them to use at site. Provide first aid facilities that are readily accessible by workers. Proper egress and ingress must be ensured for the labors. Contractor must conduct tool box talk regularly at each site. Sanitation facility must be ensured at the working site. 	March 2020	Contractor	  

Issues	Observation	Corrective Action	Deadline	Responsibility	Photograph
Construction camp	<ul style="list-style-type: none"> Construction camp is not managed satisfactorily where no boundary fence with security is observed. Contractor built a labor shed using plastic sheet without any ventilation system where 10-15 people stayed. Moreover, kitchen was also found inside the shed which increased the room temperature. No safety signs are placed in the construction camp. No housekeeping was observed there. Moreover, no waste management is found in the camp. No drainage network has been developed yet inside the camp where waste water management is not observed at all. Emergency procedure is not followed in the camp. 	<ul style="list-style-type: none"> Boundary fence along with security personnel for the construction camp should be arranged. Proper accommodation should be arranged for the labor immediately where ventilation system to be improved, however, existing shed must be dismantled asap. Site safety signage must be placed at designated locations in the camp. Separate garbage bins should be supplied for organic and inorganic wastes at the site and finally disposed at the designated location in the camp. Contractor should install garbage bins and construct a concrete waste disposal site which have the impermeable floor and wall and covered by shed to avoid air, soil and groundwater pollution. Drainage system must be developed inside the camp. Emergency contact information should be displaced at the camp site. 	March 2020	Contractor	 




AUDIT FINDINGS (EAP/DPHE/W9B) June 27, 2020

The findings from the site audits and action items required to mitigate non-conformances, where required, are provided in the sub-sections below:

Issues	Observation	Corrective Action	Deadline	Responsibility	Photographs
Site Specific EMP	Contractor should prepare site specific EMP based on subproject's EMP with details on staff, resources, implementation schedules, and monitoring procedures which to be submitted to ADB and PMU.	Contractor should prepare the SEMP immediately and submit to PD and ADB for approval.	15 July 2020	Contractor	
Permits, clearances, no objection certificate	Permits taken from RRRC must be kept at site along with EMP and other legal documents at site office. However, failure to obtain necessary permits and NOCs, etc. can result to stoppage of works.	Necessary permission from the RRRC through the CICs has to be kept for legal safety. Also frequently communicate with the CICs for any legal change or government orders. Obtain NOC from FD Obtain ECC from DoE	Immediately as per discussion with DPHE	Contractor: RRRC permits; DPHE: NOC from FD ECC from DoE	Photograph is not required.
Environmental Monitoring Survey	In order to generate the baseline data, Contractor shall undertake baseline quality tests for air, noise, water in the subproject site to serve as benchmark for subsequent monitoring but Contractor has not conducted the environmental monitoring survey till date which should be done immediately.	Contractors must conduct environmental monitoring activity immediately as per EMP.	15 July 2020	Contractor	Photograph is not required.
Environmental Monitoring Report	Contractor should prepare and submit the monitoring report including EMP implementation checklist on monthly basis but till	Prepare Environmental Inspection and Monitoring report on monthly basis.	15 July 2020	Contractor	Photograph is not required.




Issues	Observation	Corrective Action	Deadline	Responsibility	Photographs
	date not a single report has been submitted.				
H&S Plan	Health and safety plan has been prepared as per EMP and sent to PD-DPHE to share with the Contractor which might improve their construction practices but contractor has not received the plan yet.	HSP should be circulated to the contractor asap and monitoring the implementation activity accordingly.	15 July 2020	DPHE	Photograph is not required.
Hill Slope Protection	Construction site is deviated from the design location to the hilltop is razed which is prone to erosion where gully erosion along the exposed slope has already happened and made the slope unstable.	<ul style="list-style-type: none"> • Cutting hill slope must be stopped and should take engineering measures to avoid slope failure. • The earthwork sites where exposed land surface is vulnerable to runoff shall be consolidated and/or covered. 	15 July 2020	Contractor	



Issues	Observation	Corrective Action	Deadline	Responsibility	Photographs
Storm Drainage Facility	No storm drainage facility is developed yet in the construction site where surface runoff causes erosion and localized sedimentation congestion.	<ul style="list-style-type: none"> Storm drainage facility to be developed to drain out surface runoff. Channels, earth bunds, netting, tarpaulin and or sand bag barriers shall be used on site to manage surface water runoff and minimize erosion. 	15 July 2020	Contractor	
Control of Petroleum Products	<ul style="list-style-type: none"> Fuel storage is not confined and kept the drums along the kitchen. No safety signage is placed at the storage area. No fire protection is found in the site. 	<ul style="list-style-type: none"> All petroleum products shall be stored in a designated storage location where any spillage can be safely maintained without contamination of the surrounding area. Fire extinguisher must be kept at storage site Safety signs must be installed at the storage site. 	15 July 2020	Contractor	
Waste management	No waste management in the site for both construction and domestic wastes are found during monitoring.	Separate garbage bins should be supplied for organic and inorganic wastes at the site and finally disposed at the designated location in the camp.	15 July 2020	Contractor	

Issues	Observation	Corrective Action	Deadline	Responsibility	Photographs
Site Office	<ul style="list-style-type: none"> The construction site was confined but unauthorized access including children were observed in the site. Security guard yet to deploy at the site to ensure security of the project premise. No site safety signboards are placed in the site. Emergency procedure was not followed at site. 	<p>The work site should be confined using safety tape/fence and install a signage so that unauthorized movement can be restricted around the work site.</p>	15 July 2020	Contractor	
Worker Health and Safety	<ul style="list-style-type: none"> HSP is not followed at the site. Safety protocol for COVID-19 is not followed at the site. PPEs are not implemented at the site. No safety measure was taken to work at height. No first aid box not supplied at the site. No tool box meeting was conducted at site to educate the workers. 	<p>Proper PPEs should be provided at site.</p> <ul style="list-style-type: none"> Safety protocol set by government must be followed in the working site. Provide first aid facilities that are readily accessible by workers. Fire protection measures such as fire extinguisher should be available at the site. Contractor should conduct tool box meeting regularly at each site. 	15 July 2020	Contractor	 


AUDIT FINDINGS (EAP/BREB/G5) February 15, 2020

The findings from the site audits and action items required to mitigate non-conformances, where required, are provided in the sub-sections below:

Issues	Observation	Corrective Action	Deadline	Responsibility	Photographs
Worker health and safety	<ul style="list-style-type: none"> • PPEs are partially addressed. • Standard ladder should be arranged to work at height. • Site safety signs are not placed in the site. • No first aid box is available at the site. • Tool box meeting is not conducted at site to educate the workers. • Emergency procedure for accident, fire incident is not maintained at the site. 	<ul style="list-style-type: none"> • Proper PPEs should be provided at site. • Contractor should conduct tool box meeting regularly. • The excavated pond/house should be confined using safety tape for fall prevention. • Fire protection measures such as fire extinguisher should be available at the site. 	28 February 2020	Contractor	 
Community health and safety	<ul style="list-style-type: none"> • Foundation pits of solar panel, battery room are left open and causing trouble for locals • Excavated earth materials were left open. 	<ul style="list-style-type: none"> • Worksites are to be equipped with safety signs. • Work site should be confined with safety tape. • Excavated materials should be removed or properly stockpiled with cover at the site. 	28 February 2020	Contractor	

Issues	Observation	Corrective Action	Deadline	Responsibility	Photographs
Waste Management	<ul style="list-style-type: none"> Construction wastes were scattered around the work site due to absence of housekeeping at the site. There is no waste management facility in the site to manage construction waste. 	<ul style="list-style-type: none"> Contractor should clean the work site regularly and provide garbage bins for both organic and inorganic wastes. Construction wastes should be dumped in the designated place. 	28 February 2020	Contractor	
Disruption of Internal Road	<ul style="list-style-type: none"> Foundation pits for the solar panel is excavated adjacent to the internal road left open for long time which damaged the road. 	<ul style="list-style-type: none"> Foundation casting should be done immediately after excavation works. The damaged road must be repaired by the contractor. 	28 February 2020	Contractor	

Appendix III: Laboratory Test Result



GLOBAL ENVIRONMENT
CONSULTANTS LTD.

House – 3/E, South Kallyanpur, Dhaka -1207

GECL LABORATORY ANALYSIS REPORT
ON
AMBIENT AIR QUALITY (CONSTRUCTION PHASE)

Project Name : Construction & Operation of Mini Piped Water Supply System (5 Scheme)
Project Location: Cox Bazar Project, Ukhiya, CTG, Bangladesh.

Description of sample : Ambient air quality analysis report at different location
Sample collector : Global Environment Consultants Ltd. (GECL Monitoring Team)
Sampling date : November 16, 2019
Reporting date : November 122, 2019

Description of analysis

SL	Location Name with GPS Coordinate	Concentration present of different parameter in ambient air.		
		SPM	PM ₁₀	PM _{2.5}
01	Camp-13.3, Block-F-1, Hilltop, Taznmarkhola, Thaingkhali, Ukhiya GPS Coordinate: N- 21° 10.832' & E - 92° 08.434'	125	83	34
02	Camp-13.4, Block-C-16, Hilltop, Taznmarkhola, Thaingkhali, Ukhiya. GPS Coordinate: N- 21° 10.698' & E - 92° 08.324'	117	71	32
03	KRC-1, Block-F, Demander Mor, Kutupalog, Ukhiya. GPS Coordinate: N- 21° 12.668' & E - 92° 09.811'	131	87	36
04	KRC-2, Block-C, Anser Barack, Kutupalog, Ukhiya GPS Coordinate: N- 21° 12.617' & E - 92° 09.904'	121	74	39
05	Camp-8.2W, Block-I-20, Belukhali-1, Ukhiya. GPS Coordinate: N- 21° 11.832' & E - 92° 09.229'	153	91	42
Unit of Measurement		µg/m ³		
Bangladesh (DoE) Standard for ambient Air		≤ 200	≤ 150	≤ 65
International /World Bank Standard		Not Found	≤ 150	≤ 75
AQI, Central Pollution Control Board (CPCB) of India		(101-200) Moderate	(51-100) Satisfactory	(0-50) Good
Remark		Moderate	Satisfactory	Good



Multidisciplinary Development Consultants

Name of the Project	Construction & Operation of Mini Piped Water Supply System (10 Schemes): Package 2 (EAP/DPHE/W2)
Description of Sample	Ambient Air Quality
Sample Collector	Collected by DSCL Personnel
Sampling Date	15 January 2020

Test Result of Ambient Air Quality Analysis

Parameter	Unit	EAP/DPHE/W2/ AAQ_01	Bangladesh Standard	Duration (hours)	Weather Condition	Method of Analysis
		21.20622°N 92.15891°E				
		Block 05, Camp 2W-4 Ukhiya Mega Camp, Cox's Bazar				
PM _{2.5}	µg/m ³	20.52	65	24	Sunny	Gravimetric
PM ₁₀	µg/m ³	57.32	150	24		Gravimetric
SO ₂	µg/m ³	18.80	365	24		West-Geake
NO _x	µg/m ³	14.21	100	Annual		Jacob and Hochheiser
CO*	PPM	<1	9	8		CO Meter

Note:

** The Bangladesh National Ambient Air Quality Standards have been taken from the Environmental Conservation Rules, 1997 which was amended on 19th July 2005 vide J.R.O. No. 220-Law/2005.

NY's: Not Yet Standardized

Description of the Surrounding Environment

Location	Sample Site Description
Block 05, Camp 2W-4 Ukhiya Mega Camp, Cox's Bazar (EAP/DPHE/W2/AAQ_01)	<ul style="list-style-type: none"> > The weather was sunny > Beside narrow road > Beside Residential Structure > Traffic volume and people movement was low > Dust particle was low

Test Performed By:
Md. Saiful Imran
Jr. Environmental
Specialist



Checked By:
Tonmoy Pandit
Deputy Manager

Development Solutions Consultant Ltd.

House# 734 (5-B), Road# 10, Avenue# 04
DOHS Mirpur, Dhaka-1216, Bangladesh. Tel: +8801822758548
Email: dscib@dsclbd.com Web: www.dsclbd.com



Multidisciplinary Development Consultants

Name of the Project	Construction & Operation of Mini Piped Water Supply System (10 Schemes): Package W3 (EAP/DPHE/W3)
Description of Sample	Ambient Air Quality
Sampling ID	EAP/DPHE/W3/AAQ_01 (21.19769°N 92.14836°E) EAP/DPHE/W3/AAQ_02 (21.20950°N 92.16093°E)
Sample Collector	Collected by DSCL Personnel
Sampling Date	14 January 2020- 15 January 2020

Test Result of Ambient Air Quality Analysis

Parameter	Unit	EAP/DPHE/W3/ AAQ_01 21.19769°N 92.14836°E	EAP/DPHE/W3/ AAQ_02 21.20950°N 92.16093°E	Bangladesh Standard	Duration (hours)	Weather Condition	Method of Analysis
		Water Distribution Zone: 5.06, Ukhiya Mega Camp, Cox's Bazar	Water Distribution Zone: 2W.05, Ukhiya Mega Camp, Cox's Bazar				
PM _{2.5}	µg/m ³	27.1	26.3	65	24	Sunny	Gravimetric
PM ₁₀	µg/m ³	63.8	62.4	150	24		Gravimetric
SO ₂	µg/m ³	28.2	26.6	365	24		West- Gealke
NO _x	µg/m ³	11.3	10.9	100	Annual		Jacob and Hochheiser
CO*	PPM	1	<1	9	8		CO Meter

Note:

** The Bangladesh National Ambient Air Quality Standards have been taken from the Environmental Conservation Rules, 1997 which was amended on 19 July 2005 vide S.R.O. No. 220-Law/2005.

NYS: Not Yet Standardized

Sample Site Description

Location	Sample Site Description
Water Distribution Zone: 5.06, Ukhiya Mega Camp, Cox's Bazar (EAP/DPHE/W3/AAQ_01)	<ul style="list-style-type: none"> ➤ The weather was partially sunny ➤ Beside Residential Structure ➤ Traffic volume and people movement was high ➤ Dust particle was moderate ➤ People movement was moderate
Water Distribution Zone: 2W.05, Ukhiya Mega Camp, Cox's Bazar (EAP/DPHE/W3/AAQ_02)	<ul style="list-style-type: none"> ➤ The weather was sunny and humid ➤ Vegetation cover was low ➤ Beside residential structure ➤ Dust particle was moderate ➤ People movement was moderate

Test Performed By:
Saful Islam Imran
Jr. Environmental Specialist



Checked By:
Tonmoy Pandit
Deputy Manager

Development Solutions Consultant Ltd.

House# 734 (5-B), Road# 10, Avenue# 04
DOHS Mirpur, Dhaka-1216, Bangladesh. Tel: +8801822857548
Email: dsccl@dsclbd.com Web: www.dsclbd.com



DSCL

Multidisciplinary Development Consultants

Name of the Project	Construction & Operation of Mini Piped Water Supply System (5 Schemes): Package W5 (EAP/DPHE/W5)
Description of Sample	Ambient Air Quality
Sample Collector	Collected by DSCL Personnel
Sampling Date	7 January 2020

Test Result of Ambient Air Quality Analysis

Parameter	Unit	EAP/DPHE/W5/ AAQ_01	Bangladesh Standard	Duration (hours)	Weather Condition	Method of Analysis
		21.19869°N 92.15635°E Water Distribution Zone: 8W.4(Ext), Ukhiya Mega Camp, Cox's Bazar				
PM _{2.5}	µg/m ³	24.5	65	24	Sunny	Gravimetric
PM ₁₀	µg/m ³	64.6	150	24		Gravimetric
SO ₂	µg/m ³	23.2	365	24		West- Geake
NO _x	µg/m ³	19.8	100	Annual		Jacob and Hochheiser
CO*	PPM	<1	9	8		CO Meter

Note:

** The Bangladesh National Ambient Air Quality Standards have been taken from the Environmental Conservation Rules, 1997 which was amended on 19 July 2005 vide S.R.O. No. 220-Law/2005.

NYS: Not Yet Standardized

Description of the Surrounding Environment

Location	Sample Site Description
Water Distribution Zone: 8W.4(Ext), Ukhiya Mega Camp, Cox's Bazar (EAP/DPHE/W5/AAQ_01)	<ul style="list-style-type: none"> ➤ The weather was sunny ➤ Construction work going on ➤ Traffic volume and people movement was moderate ➤ Dust particle was moderate ➤ Vegetation cover was moderate

Test Performed By:
Saiful Islam Imran
Jr. Environmental Specialist



Checked By:
Tonmoy Pandit
Deputy Manager

Development Solutions Consultant Ltd.
House# 734 (5-B), Road# 10, Avenue# 04
DOHS Mirpur, Dhaka-1216, Bangladesh. Tel: +8801822857548
Email: dscl@dsclbd.com Web: www.dsclbd.com

প্বেষ হািন্দার ঝাংলাদেশ
পরিস্রল্ল পৰিবেশ



Government of The People's Republic of Bangladesh.
Department of Environment
Chattogram Divisional Laboratory
Zakir Hossain Road, Khulshi, Chattogram.
Email: ctglab@doe.gov.bd

Memo No. 22.02.1500.186.68953.2020.- 534(A)

Date:- 26.02.2020

Name and Address of Applicant/Organization: Mohammad Mosharraf Hossain, Consultant, Shamlapur Sewrage Treatment Plant
Project Under DPHE.
Subject: Ambient Air Analysis Report.
Reference: As per entrepreneur's application Dated -28.01.2020
Sampling Date: 02.02.2020

Sample Location	Lab code	SPM $\mu\text{g}/\text{m}^3$	PM ₁₀ $\mu\text{g}/\text{m}^3$	PM _{2.5} $\mu\text{g}/\text{m}^3$	SO ₂ ppm	NO ₂ ppm	CO ppm
North Acarbunia, Shamlapur, Teknaf	A-335	-	79	34	0.01	0.026	0.02
Lamar Bazar, Shamlapur, Teknaf	A-336	-	86	37	0.01	0.023	0.01
Lamar Bazar, Shamlapur, Teknaf	A-337	-	91	39	0.01	0.025	0.01
Bangladesh Standard of Gaseous Emission from Industries or project as per ECR 1997.		≤ 200	≤ 150	≤ 65	≤ 0.14	-	≤ 35

Remarks:- The PM₁₀, PM_{2.5}, SO₂ & CO parameter are within the acceptable limit of environment conservation rules, 1997 (Revised-2005).

Sample Collected by
Md. Bashir Uddin
Sample Collector

Tested by
MD. SHAFIQUUL ISLAM
Junior Chemist

Checked by
Rubayat Tahrin Sourav
Senior Chemist

Approved by
Mohammad Nurullah Noor
Director (Deputy Secretary)
Chattogram Laboratory
Department of Environment, Chattogram



GLOBAL ENVIRONMENT
CONSULTANTS LTD.

House – 3/E, South Kallyanpur, Dhaka-1207

GECL LABORATORY ANALYSIS REPORT
ON
AMBIENT NOISE LEVEL ASSESSMENT
(Construction Phase)

Project Name : Construction & Operation of Mini Piped Water Supply System (5 Scheme)
Project Location : Cox Bazar Project, Ukhiya, CTG, Bangladesh.

Description of sample : Ambient noise level assessment report at different location

Sample collector : Global Environment Consultants Ltd. (GECL Monitoring Team)

Sampling date : November 16, 2019 (Test Duration - 8 hours)

Reporting date : November 22, 2019

RESULTS OF AMBIENT NOISE LEVEL ASSESSMENT AT DIFFERENT AREA		
Location Name with GPS Coordinate	Concentration present (LA _{eq}) dBA	
	Time	(LA _{eq}) dBA, (Day Time)
Camp-13.3, Block-F-1, Hilltop, Taznimar Khola, Thaingkhali, Ukhiya. (GPS Coordinate: N- 21° 10.832' & E - 92° 08.434')	11.00 AM	54.16
	12.00 PM	60.24
	01.00 PM	63.25
	02.00 PM	50.45
	03.00 PM	61.35
	04.00 PM	56.28
	05.00 PM	62.22
	06.00 PM	58.42
Average Noise Level (dBA)		59.68
Camp-13.4, Block-C-16, Hilltop, Taznimar Khola, Thaingkhali, Ukhiya. (GPS Coordinate: N- 21° 10.696' & E - 92° 08.324')	11.15 AM	47.53
	12.15 PM	55.47
	01.15 PM	60.35
	02.15 PM	59.36
	03.15 PM	61.25
	04.15 PM	57.34
	05.15 PM	61.28
	06.15 PM	59.26
Average Noise Level (dBA)		58.17
Bangladesh (DoE) Standard		
Category of area		Day Time
Industrial area		≤ 75 dB
Commercial Area		≤ 70 dB
Mixed Area		≤ 60 dB
Residential Area		≤ 55 dB
WHO Guideline		
Industrial, commercial, shopping and traffic areas, indoors and Outdoors		≤ 70 dB
Outdoor living area		≤ 50 dB
World Bank / IFC Standard		
Industrial		≤ 70 dB
Residential; Institutional; Educational		≤ 55 dB



House – 3/E, South Kallyanpur, Dhaka-1207

Location Name with GPS Coordinate	Concentration present (LA _{eq}) dBA	
	Time	(LA _{eq}) dBA (Day Time)
KRC-1, Block-F, Demander Mor, Kutupalog, Ukhlya. (GPS Coordinate: N- 21° 12.668' & E - 92° 09.811')	11.00 AM	54.34
	12.00 PM	60.42
	01.00 PM	65.64
	02.00 PM	59.32
	03.00 PM	61.58
	04.00 PM	58.46
	05.00 PM	54.38
	06.00 PM	63.28
Average Noise Level (dBA)		59.68
KRC -2, Block-C, Anser Barack, Kutupalog, Ukhlya. (GPS Coordinate: N- 21° 12.617' & E - 92° 09.904')	11.15 AM	55.54
	12.15 PM	57.53
	01.15 PM	54.28
	02.15 PM	61.36
	03.15 PM	52.43
	04.15 PM	58.44
	05.15 PM	60.53
	06.15 PM	65.28
Average Noise Level (dBA)		58.17
Camp-8.2W, Block-I-20, Balukhall-1, Ukhlya (GPS Coordinate: N- 21° 11.832' & E - 92° 09.229')	10.00 AM	56.24
	11.00 AM	62.62
	12.00 PM	55.23
	01.00 PM	61.32
	02.00 PM	53.14
	03.00 PM	55.25
	04.00 PM	59.37
	05.00 PM	65.49
Average Noise Level (dBA)		58.58
Bangladesh (DoE) Standard		
Category of area		Day Time
Industrial area		≤ 75 dB
Commercial Area		≤ 70 dB
Mixed Area		≤ 60 dB
Residential Area		≤ 55 dB
WHO Guideline		
Industrial, commercial, shopping and traffic areas, indoors and Outdoors		≤ 70 dB
Outdoor living area		≤ 50 dB
World Bank / IFC Standard		
Industrial		≤ 70 dB
Residential; Institutional; Educational		≤ 55 dB



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Name of the Project	Construction & Operation of Mini Piped Water Supply System (10 Schemes): Package 2 (EAP/DPHEW2)
Description of Sample	Noise Level Measurement
Sample Collector	Collected by DSCCL Personnel
Sampling Date	15 January 2020

Noise Level Analysis

Sample ID	Sample Location	GPS Location	Land Use Category	Time		Noise Level (dBA) (LA _{eq})	Bangladesh Standard (dBA) **
				Start	End		
EAP/DPHEW2/ NM_01	Camp :2W-4 Block-D	21.20822°N 92.15891°E	Residential	11:00 am	01:00 pm	53.3	55
EAP/DPHEW2/ NM_02	Camp :2W-D5, Beside Madrasa	21.20852°N 92.15903°E	Residential	01:15 pm	03:15 pm	58.1	55
EAP/DPHEW2/ NM_03	Camp :2W, Beside CIC	21.20907°N 92.15995°E	Residential	10:30 am	12:30 pm	61.2	55
EAP/DPHEW2/ NM_04	Camp :2W-D4, In front of IOM Hospital	21.21007°N 92.15753°E	Residential	12:45 pm	02:45 pm	54.7	55
EAP/DPHEW2/ NM_05	Camp :2W-D4, Opposite Site of Camp 6	21.20959°N 92.15741°E	Residential	03:00 pm	05:00 pm	53.8	55
Notes: <ul style="list-style-type: none"> Land use category is based on the classification provided in the Noise Pollution Control Rules (2006) The sound level standards for residential area are 55 at day time and 45 at night time. Noise Level is the average noise recorded over the duration of the monitoring period 							

Development Solutions Consultant Ltd.

House# 734 (5-B), Road# 10, Avenue# 04
DOHS Mirpur, Dhaka-1216, Bangladesh. Tel: +8801822758548
Email: dsccl@dscclbd.com Web: www.dscclbd.com



Multidisciplinary Development Consultants

Name of the Project	Construction & Operation of Mini Piped Water Supply System (10 Schemes): Package W3 (EAP/DPHE/W3)
Description of Sample	Noise Level Measurement
Sample Collector	Collected by DSCL Personnel
Sampling Date	14 January 2020 - 16 January 2020

Noise Level Analysis

Sample ID	Sample Location	GPS Location	Land Use Category	Time		Noise Level (dBA) (LAeq)	Bangladesh Standard (dBA) **
				Start	End		
EAP/DPHE/W3/NM_01	WDZ: 2E.03, Ukhiya Mega Camp, Cox's Bazar	21.20600°N 92.16484°E	Residential	9:10 am	11:10 am	65.2	55
EAP/DPHE/W3/NM_02	WDZ: 2E.02, Ukhiya Mega Camp, Cox's Bazar	21.20557°N 92.16310°E	Residential	11:34 am	01:34 pm	59.3	55
EAP/DPHE/W3/NM_03	WDZ: 2E.01, Ukhiya Mega Camp, Cox's Bazar	21.20645°N 92.16341°E	Residential	02:10 pm	04:10 pm	54.8	55
EAP/DPHE/W3/NM_04	WDZ: 2W.06, Ukhiya Mega Camp, Cox's Bazar	21.20943°N 92.16268°E	Residential	06:30 am	10:30 am	59.3	55
EAP/DPHE/W3/NM_05	WDZ: 2W.05, Ukhiya Mega Camp, Cox's Bazar	21.20939°N 92.16108°E	Residential	11:05 am	01:05 pm	65.7	55
EAP/DPHE/W3/NM_06	WDZ: 2W.01, Ukhiya Mega Camp, Cox's Bazar	21.20748°N 92.15573°E	Residential	01:20 pm	03:20 pm	58.4	55
EAP/DPHE/W3/NM_07	WDZ: 5.06, Ukhiya Mega Camp, Cox's Bazar	21.19773°N 92.14838°E	Residential	08:15 am	10:15 am	57.7	55
EAP/DPHE/W3/NM_08	WDZ: 5.5, Ukhiya Mega Camp, Cox's Bazar	21.20233°N 92.15285°E	Residential	10:40 am	12:40 pm	61.1	55
EAP/DPHE/W3/NM_09	WDZ: 5.4, Ukhiya Mega Camp, Cox's Bazar	21.20230°N 92.15120°E	Residential	12:58 pm	02:58 pm	60.9	55
EAP/DPHE/W3/NM_10	WDZ: 13.2, Ukhiya Mega Camp, Cox's Bazar	21.18001°N 92.13691°E	Residential	03:15 pm	05:15 pm	58.3	55

Notes:

- Land use category is based on the classification provided in the Noise Pollution Control Rules (2006)
- The sound level standards for residential area are 55 at day time and 45 at night time.
- Noise Level is the average noise recorded over the duration of the monitoring period

Abbreviation:

NM: Noise Measurement, dB- decibel

Development Solutions Consultant Ltd.

House# 734 (5-8), Road# 10, Avenue# 04
DOHS Mirpur, Dhaka-1216, Bangladesh. Tel: +8801822857548
Email: dsc@dsclbd.com Web: www.dsclbd.com



Multidisciplinary Development Consultants

Name of the Project	Construction & Operation of Mini Piped Water Supply System (5 Schemes): Package W5 (EAP/DPHEW5)
Description of Sample	Noise Level Measurement
Sample Collector	Collected by DSCL Personnel
Sampling Date	7 January 2020 – 8 January 2020

Noise Level Analysis

Sample ID	Sample Location	GPS Location	Land Use Category	Time		Noise Level (dBA) (L _{Aeq})	Bangladesh Standard (dBA) **
				Start	End		
EAP/DPHEW5/NM_01	WDZ: 5.03, Ukhiya Mega Camp, Cox's Bazar	21.20095°N 92.14740°E	Residential	11:00 am	01:00 pm	58.5	55
EAP/DPHEW5/NM_02	WDZ: 0E.03, Ukhiya Mega Camp, Cox's Bazar	21.20450°N 92.16630°E	Residential	01:15 pm	03:15 pm	57.2	55
EAP/DPHEW5/NM_03	WDZ: 8W.6, Ukhiya Mega Camp, Cox's Bazar	21.19457°N 92.15565°E	Residential	10:00 am	12:00 pm	54.6	55
EAP/DPHEW5/NM_04	WDZ: 8W.4(Ext), Ukhiya Mega Camp, Cox's Bazar	21.19672°N 92.15634°E	Residential	12:15 pm	02:15 pm	64.1	55
EAP/DPHEW5/NM_05	WDZ: 8W.9, Ukhiya Mega Camp, Cox's Bazar	21.19710°N 92.15939°E	Residential	02:30 pm	04:30 pm	59.3	55

Notes:

- Land use category is based on the classification provided in the Noise Pollution Control Rules (2006)
- The sound level standards for residential area are 55 at day time and 45 at night time
- Noise Level is the average noise recorded over the duration of the monitoring period

Abbreviation:
NM- Noise Measurement, dB- decibel

Development Solutions Consultant Ltd.

House# 734 (5-B), Road# 10, Avenue# 04
DOHS Mirpur, Dhaka-1216, Bangladesh. Tel: +8801822857548
Email: dscl@dsclbd.com Web: www.dsclbd.com



House – 3/E, South Kailyanpur, Dhaka-1207

GECL LABORATORY ANALYSIS REPORT
ON
SURFACE WATER QUALITY (CONSTRUCTION PHASE)

Project Name : Construction & Operation of Mini Piped Water Supply System (5 Scheme).
Project Address : Cox Bazar Project, Ukhiya, CTG, Bangladesh.

Description of sample : Surface Water quality analysis report at project different location.
Sample Location, ID & Name with GPS Coordinate:

SL1 - Cannel Water from TaznimerKhola, Thaingkhali, Ukhiya. (GPS Coordinate: N- 21° 10.504' & E - 92° 08.603').

SL2 - Pond Water from TaznimerKhola, Thaingkhali, Ukhiya, (GPS Coordinate: N- 21° 10.538' & E - 92° 08.616').

SL3 - Pond Water from Lambasia Area, KRC-1, Kutupalong, Ukhiya, (GPS Coordinate: N- 21° 12.522' & E - 92° 09.209'').

SL4 - Cannel water from Lambasia Area, KRC-2, Kutupalong, Ukhiya, (GPS Coordinate: N- 21° 12.506' & E - 92° 09.197'').

SL5 - Cannel Water from Kutupalong, Ukhiya, (GPS Coordinate: N- 21° 11.811' & E - 92° 09.289'').

Sample collector: Global Environment Consultants Ltd. (GECL Monitoring Team)

Sampling date : November 16, 2019

Reporting date : November 22, 2019

Description of analysis

SN	Parameters	Unit	Analysis Method	Bangladesh (DOE) standard	Concentration Present				
					SL1	SL2	SL3	SL4	SL5
1	pH	-	pH Meter	6.0-9.0	8.13	7.21	7.19	8.19	8.81
2	Total Dissolved Solid (TDS)	mg/L	Gravimetric	2100	476	391	520	534	324
3	Oil and Grease	mg/L	Solvent extraction followed by UV visible spectrophotometer	10	14.13	2.11	1.71	16.11	11.14
4	Dissolved Oxygen (DO)	mg/L	Azide modification	4.5 - 8.0	1.9	4.8	4.9	1.2	1.5
5	Biochemical Oxygen Demand (BOD ₅)	mg/L	Dilution	50	41	13	12	39	29
6	Chemical Oxygen Demand (COD)	mg/L	COD Refluction	200	157	36	31	148	117

SL- Sample Location



Multidisciplinary Development Consultants

Name of the Project	Construction & Operation of Mini Piped Water Supply System (10 Schemes): Package W3 (EAP/DPHE/W3)
Description of Sample	Surface Water Quality
Sampling ID	EAP/DPHE/W3/SW_01 (21.19869°N 92.15636°E)
Sample Collector	Collected by DSCL Personnel
Sampling Date	15 January 2020

Test Result of Surface Water Quality Analysis

Parameters	Unit	Concentration Present	Standards for Inland Surface Water* (ECR,1997)	Standards for Project Waste Water* (ECR,1997)	Analysis Method
		WDZ-5.06, Ukhya Mega Camp, Cox's Bazar			
		EAP/DPHE/W3/SW_01 21.19869°N 92.15636°E			
pH*	-	8.3	6-9	6-9	Multimeter
Electrical Conductivity (EC)*	µs/cm	894	1200	1200	Multimeter
Dissolved Oxygen (DO)*	mg/L	3.9	4.5-8	4.5-8	DO Meter

Note:

** The Standards for Inland Surface Water have been taken from the Environmental Conservation Rules

*On-site Test

Sample Location and ID	Sample Site Description
WDZ-5.06, Ukhya Mega Camp, Cox's Bazar (EAP/DPHE/W3/SW_01)	<ul style="list-style-type: none"> > Rain water drains in the canal. > Water is using for bathing purposes > Water is not polluted > The workers also use the water for construction purposes



Saiful Islam Imran
Test Performed By:
Saiful Islam Imran
Jr. Environmental Specialist



Tonmoy Pandit
Checked By:
Tonmoy Pandit
Deputy Manager

Development Solutions Consultant Ltd.

House# 734 (5-B), Road# 10, Avenue# 04
DOHS Mirpur, Dhaka-1216, Bangladesh. Tel: +9801822857548
Email: dsc@dsclbd.com Web: www.dsclbd.com

	Government of the People's Republic of Bangladesh Office of the Chief Chemist Department of Public Health Engineering Central Lab, 38-39, Mohakhali C/A, Dhaka-1212 Phone: 88-02-9881927, Fax: 88-02-9882033, Email: wqmac_central_lab@yahoo.com	
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Lab Memo: 542/CC, DPHE, CL, Dhaka

Date: 27-01-2020

Physical/Chemical/Bacteriological Analysis of Water Sample



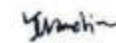

Sample ID: CEN2020010153	Sample Receiving date: 16-01-2020
Ref. Memo No. DSCL/2020/Nill & Dated: 16-01-2020	Sample Source: Surface Water
Sent by: Tonmoy Pandit, Deputy Manager, DSCL, Mirpur DOHS, Dhaka-1226	District: Cox's Bazar, Upa: Ukhiya
Care Taker: DSCL (Sample ID: EAP/DPHE/W3/SW_01)	Union, Vil: Ukhiya Mega Camp
Sample Collection Date:	Date of Testing: 16/01/2020-27/01/2020

LABORATORY TEST RESULTS:

Sl.#	Water quality parameters	Bangladesh Standard	Concentration Present	Unit	Analysis Method	LOQ
1	Ammonia (NH ₃)	0.5	5.41	mg/L	UVS	0.1
2	Biochemical Oxygen Demand (BOD)	0.2	28	mg/L	5 days incubation	0.1
3	Chemical Oxygen Demand (COD)	4.0	143	mg/L	CRM	-
4	Chloride	150-600	87	mg/L	Titrimetric	-
5	Turbidity	10	1665	NTU	Turbidity Meter	-
6	Total Suspended Solid (TSS)	10	43	mg/L	Gravimetric Method	-

Comments: Sample was collected & Supplied by client.

N.B: UVS- UV-Visible Spectrophotometer, CRM-Closed Reflex Methods, LOQ - Limit of Quantitation.

Test Performed by: 1.) Name: Md. Saiful Alam Khosru Designation: Sample Analyzer  2.) Name: Taslima Akhter Designation: Sample Analyzer 	Countersigned/Approved by: 1.) Name: Md. Zahidul Islam Miah Designation: Senior Chemist  2.) Name: Md. Biplob Hossain Designation: Chief Chemist  Md. Biplob Hossain Chief Chemist Department of Public Health Engineering Central Laboratory Mohakhali, Dhaka.
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Multidisciplinary Development Consultants

Name of the Project	Construction & Operation of Mini Piped Water Supply System (5 Schemes): Package W5 (EAP/DPHE/W5)
Description of Sample	Surface Water Quality
Sample Collector	Collected by DSCCL Personnel
Sampling Date	8 January 2020

Test Result of Surface Water Quality Analysis

Parameters	Unit	Concentration Present	Standards for Inland Surface Water* (ECR, 1997)	Standards for Project Waste Water* (ECR, 1997)	Analysis Method
		WDZ-8W.4E, Ukhiya Mega Camp, Cox's Bazar			
		EAP/DPHE/W5/SW_01 21.211887°N 92.148304°E			
pH*	-	7.9	6-9	6-9	Multimeter
Electrical Conductivity (EC)*	µs/cm	865	1200	1200	Multimeter
Dissolved Oxygen (DO)*	mg/L	3.6	4.5-8	4.5-8	DO Meter

Standards for Inland Surface Water and Project Waste Water is followed Environmental Conservation Rule (ECR) '97

* On-site Test Result

Description of the Surrounding Environment

Sample Location and ID	Sample Site Description
WDZ-8W.4E, Ukhiya Mega Camp, Cox's Bazar (EAP/DPHE/W5/SW_01)	<ul style="list-style-type: none"> ➤ Rain water drains in the canal. ➤ Water is using for bathing purposes ➤ Water is slightly polluted ➤ The polluted water from construction activities washes into this canal.



Saiful Islam Imran
Test Performed By:
Saiful Islam Imran
Jr. Environmental Specialist



Tonmoy Pandit
Checked By:
Tonmoy Pandit
Deputy Manager

Development Solutions Consultant Ltd.

House# 734 (5-B), Road# 10, Avenue# 04
DOHS Mirpur, Dhaka-1216, Bangladesh. Tel: +8801822857548
Email: dsccl@dscclbd.com Web: www.dscclbd.com

	Government of the People's Republic of Bangladesh Office of the Chief Chemist Department of Public Health Engineering Central Lab, 38-39, Mohakhali C/A, Dhaka-1212 Phone: 88-02-9681927, Fax: 88-02-9682003, Email: wqmc_central_lab@yahoo.com	
Lab Memo: 532/CC, DPHE, CL, Dhaka		Date: 19-01-2020

Physical/Chemical/Bacteriological Analysis of Water Sample




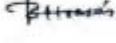
Sample ID: CEN2020010141	Sample Receiving date: 09-01-2020
Ref. Memo No. DSCL/2020/Nil & Dated: 09-01-2020	Sample Source: Surface Water
Sent by: Tonmoy Pandit, Deputy Manager, DSCL, Mirpur DOHS, Dhaka-1226	District: Cox's Bazar, Upa: Ukhiya
Care Taker: DSCL (Sample ID: EAP/DPHE/WS/SW_01)	Union: Vill: Ukhiya Mega Camp
Sample Collection Date:	Date of Testing: 09/01/2020-19/01/2020

LABORATORY TEST RESULTS:

Sl.#	Water quality parameters	Bangladesh Standard	Concentration Present	Unit	Analysis Method	LOQ
1	Ammonia (NH ₃)	0.5	6.9	mg/L	UVS	0.1
2	Biochemical Oxygen Demand (BOD)	0.2	26	mg/L	5 days incubation	0.1
3	Chemical Oxygen Demand (COD)	4.0	118	mg/L	CRM	-
4	Chloride	150-600	82	mg/L	Titrimetric	-
5	Turbidity	10	1859	NTU	Turbidity Meter	-
6	Total Suspended Solid (TSS)	10	41	mg/L	Gravimetric Method	-

Comments: Sample was collected & Supplied by client.

N.B: UVS- UV-Visible Spectrophotometer, CRM-Closed Reflex Methods, LOQ - Limit of Quantitation.

Test Performed by: 1.) Name: Md. Saiful Alam Khosru Designation: Sample Analyzer  2.) Name: Taslima Akhter Designation: Sample Analyzer 	Countersigned/Approved by: 1.) Name: Md. Zahidul Islam Miah Designation: Senior Chemist  2.) Name: Md. Biplob Hossain Designation: Chief Chemist  Md. Biplob Hossain Chief Chemist Department of Public Health Engineering Central Laboratory Mohakhali, Dhaka.
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Tel: 58154273-4, 8128258-9
Fax: 880-2-9141234
E-mail: wqtl@ngof.org
Website: www.ngof.org

Water Quality Testing Laboratory



Drink Safe Water Save Life

Chemical/Bacteriological/Physical Analysis of Water Samples

WQTL Code: CB-22

Ref.: WQTL/209 - 122/20

Date: 10-February-20

Lab Code: CB22-1/6

Date of Sample Receiving: 03-February-20

Sample(s) Sent By: Thesis Purpose, Dr. Mahammed Mosharraf Hossain - Teknaf,
Cox's Bazar

General Information of Samples:

Technology/Sample Source: Surface Water

Tested parameters: TC, FC, BOD, pH, Conductivity

Union: Shamlapur

Upazila: Teknaf

Camp: Capm-23

District: Cox's Bazar


TEST RESULTS

Sample Code: Site-1, Surface Water

Name of Parameters	Concentration Present	Drinking Water Quality Standard (ECR '97 – Bangladesh)	Unit
TC	3250	0	#/100mL
FC	2600	0	#/100mL
BOD ₅ 20°C	14	0.2	mg/L
pH	8.1	6.5 - 8.5	-
Conductivity	22.6	-	(µS/cm)

Note: Samples were collected in our prescribed container and received in sealed condition.

Report prepared and checked by –


Saleh Uddin Mahmud
Chemist

Tel: 58154273-4, 8128258-9
Fax: 880-2-9141234
E-mail: wqtl@ngof.org
Website: www.ngof.org

Water Quality Testing Laboratory



Drink Safe Water Save Life

Chemical/Bacteriological/Physical Analysis of Water Samples

WQTL Code: X-37

Ref.: WQTL/209 - 121/20

Date: 17-Feb-20

Sample Code: X37-1/6

Date of Sample Receiving: 5-Feb-20

Sample(s) Sent By: Thesis

General Information of Samples:

Technology/Sample Source: **Surface Water**

Tested parameters: TSS, DO & COD

Camp: 23

Union: Shamlapur

Upazila: Teknaf

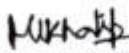
District: Cox's Bazar

Location of Water Point : **Site-1, Surface Water**

TEST RESULTS

Name of Parameters	Concentration Present	Drinking Water Quality Standard (ECR '97 – Bangladesh)	Unit
TSS	<2	10	mg/L
DO	4.8	6	mg/L
COD	50	-	mg/L

Report Prepared & Checked by -


Md. Ibrahim Khalil
Sr. Chemist



S. M. Shahidullah
Manager

Tel: 58154273-4, 8128258-9
Fax: 880-2-9141234
E-mail: wqtl@ngof.org
Website: www.ngof.org

Water Quality Testing Laboratory



Drink Safe Water Save Life

Chemical/Bacteriological/Physical Analysis of Water Samples

WQTL Code: CB-22

Ref.: WQTL/209 - 122/20

Date: 10-February-20

Lab Code: CB22-3/6

Date of Sample Receiving: 03-February-20

Sample(s) Sent By: Thesis Purpose, Dr. Mohammed Mosharraf Hossain - Teknaf,

Cox's Bazar

General Information of Samples:

Technology/Sample Source: **Surface Water**

Tested parameters: TC, FC, BOD, pH, Conductivity

Union: Shamlapur

Camp: Capm-23

Upazila: Teknaf

District: Cox's Bazar

TEST RESULTS

Sample Code: Site-2, Surface Water

Name of Parameters	Concentration Present	Drinking Water Quality Standard (ECR '97 – Bangladesh)	Unit
TC	230	0	#/100mL
FC	160	0	#/100mL
BOD ₅ 20°C	13.1	0.2	mg/L
pH	8.1	6.5 - 8.5	-
Conductivity	24.1	-	(µS/cm)

Note: Samples were collected in our prescribed container and received in sealed condition.

Report prepared and checked by –

Saleh Uddin Mahmud
Chemist

Tel: 58154273-4, 8128258-9
Fax: 880-2-9141234
E-mail: wqtl@ngof.org
Website: www.ngof.org

Water Quality Testing Laboratory



Drink Safe Water Save Life

Chemical/Bacteriological/Physical Analysis of Water Samples

WQTL Code: X-37

Ref.: WQTL/209 - 121/20

Date: 17-Feb-20

Sample Code: X37-3/6

Date of Sample Receiving: 5-Feb-20

Sample(s) Sent By: Thesis -

General Information of Samples:

Technology/Sample Source: **Surface Water**

Tested parameters: TSS, DO & COD

Camp: 23

Upazila: Teknaf

Union: Shamlapur

District: Cox's Bazar

Location of Water Point : **Site-2, Surface Water**

TEST RESULTS

Name of Parameters	Concentration Present	Drinking Water Quality Standard (ECR '97 – Bangladesh)	Unit
TSS	<2	10	mg/L
DO	4.5	6	mg/L
COD	43	-	mg/L

Report Prepared & Checked by -


Md. Ibrahim Khalil
Sr. Chemist



S. M. Shahidullah
Manager

Tel: 58154273-4, 8128258-9
Fax: 880-2-9141234
E-mail: wqtl@ngof.org
Website: www.ngof.org

Water Quality Testing Laboratory



Drink Safe Water Save Life

Chemical/Bacteriological/Physical Analysis of Water Samples

WQTL Code: CB-22

Ref.: WQTL/209 - 122/20

Date: 10-February-20

Lab Code: CB22-5/6

Date of Sample Receiving: 03-February-20

Sample(s) Sent By: Thesis Purpose, Dr. Mohammed Mosharraf Hossain - Teknaf,
Cox's Bazar

General Information of Samples:

Technology/Sample Source: **Surface Water**

Tested parameters: TC, FC, BOD, pH, Conductivity

Union: Shamlapur

Camp: Capm-23

Upazila: Teknaf

District: Cox's Bazar

TEST RESULTS

Sample Code: Site-3, Surface Water

Name of Parameters	Concentration Present	Drinking Water Quality Standard (ECR '97 – Bangladesh)	Unit
TC	400	0	#/100mL
FC	250	0	#/100mL
BOD ₅ 20°C	9.3	0.2	mg/L
pH	7.5	6.5 - 8.5	-
Conductivity	50860	-	(µS/cm)

Note: Samples were collected in our prescribed container and received in sealed condition.

Report prepared and checked by –


Saleh Uddin Mahmud
Chemist

Tel: 58154273-4, 8128258-9
Fax: 880-2-9141234
E-mail: wqtl@ngof.org
Website: www.ngof.org

Water Quality Testing Laboratory



Drink Safe Water Save Life

Chemical/Bacteriological/Physical Analysis of Water Samples

WQTL Code: X-37

Ref.: WQTL/209 - 121/20

Date: 17-Feb-20

Sample Code: X37-5/8

Date of Sample Receiving: 5-Feb-20

Sample(s) Sent By: Thesis -

General Information of Samples:

Technology/Sample Source: **Surface Water**

Tested parameters: TSS, DO & COD

Camp: 23

Union: Shamlapur

Upazila: Teknaf

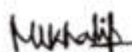
District: Cox's Bazar

Location of Water Point : **Site-3, Surface Water**

TEST RESULTS

Name of Parameters	Concentration Present	Drinking Water Quality Standard (ECR '97 – Bangladesh)	Unit
TSS	<2	10	mg/L
DO	5.2	6	mg/L
COD	29	-	mg/L

Report Prepared & Checked by -


Md. Ibrahim Khalil
Sr. Chemist



S. M. Shahidullah
Manager



GLOBAL ENVIRONMENT
CONSULTANTS LTD.

House – 3/E, South Kallianpur, Dhaka - 1207

GECL LABORATORY ANALYSIS REPORT
ON
GROUND WATER QUALITY (CONSTRUCTION PHASE)

Project Name : Construction & Operation of Mini Piped Water Supply System (S Scheme).
Project Location : Cox Bazar Project, Ukhiya, CTG, Bangladesh.

Description of sample : Ground water quality analysis report at project different location.
Sample Location, ID & Name with GPS Coordinate:

SL1 - Camp-13.3, Block-F-1, Hilltop, Taznimarkhola, Thaingskhali, Ukhiya. (GPS Coordinate: N- 21° 10.843' & E - 92° 08.447')

SL2 - Camp-13.4, Block-C-16, Hilltop, Taznimarkhola, Thaingskhali, Ukhiya. (GPS Coordinate: N- 21° 10.695' & E - 92° 08.315')

SL3 - KRC-1, Block-E, Demander Mar, Kutupalong, Ukhiya (GPS Coordinate: N- 21° 12.668' & E - 92° 09.811')

SL4 - KRC-2, Block-C, Anser Barack, Kutupalong, Ukhiya (GPS Coordinate: N- 21° 12.618' & E - 92° 09.900')

SL5 - Camp-8.2W, Block-I-20, Belukhali-1, Ukhiya (GPS Coordinate: N- 21° 11.832' & E - 92° 09.229')

Sample collector : Global Environment Consultants Ltd. (GECL Monitoring Team).

Sampling date : November 16, 2019

Reporting date : November 22, 2019

Description of analysis

S N	Parameters	Unit	Analysis Method	Bangladesh (DOE) standard	Concentration Present					Remark
					SL1	SL2	SL3	SL4	SL5	
1	pH	-	pH Meter	6.5-8.5	7.14	7.20	7.11	7.20	7.21	Good
2	Total Dissolved Solid (TDS)	mg/L	Gravimetric	1000	154	181	210	230	174	Good
3	Iron (Fe)	mg/L	1,10 Phenanthroline UV-visible spectrophotometer	0.3 - 1.0	0.91	0.84	0.22	0.73	0.91	Good
4	Arsenic (As)	mg/L	Silver DDTC, UV-visible	0.05	0.011	<0.001	<0.001	0.017	<0.001	Good
5	Sulfide (s)	mg/L	UV- method	0.00	<0.001	<0.001	<0.001	<0.001	<0.001	Good
6	Chloride	mg/L	Silver nitrate - Mohr method	150-600	79.3	77.5	79.14	72.1	75.12	Good
7	Alkalinity	mg/L	Burette Method 8221		67	71	62	68	70	Good
8	Total Hardness	mg/L	Complexometric titration by EDTA	200-500	84	79	69	72	78	Good
9	Lead	mg/L	Flame AAS with air acetylene flame	0.05	<0.001	BDL	BDL	0.006	<0.0001	Good

SL- Sample Location



Multidisciplinary Development Consultants

Name of the Project	Construction & Operation of Mini Piped Water Supply System (10 Schemes): Package 2 (EAP/DPHE/W2)
Description of Sample	Ground Water Quality
Sampling ID	EAP/DPHE/W2/SW_01 (21.208270N 92.158580E)
Sample Collector	Collected by DSCL Personnel
Sampling Date	15 January 2020

Test Result of Surface Water Quality Analysis

Parameters	Unit	Concentration Present	Standards for Drinking Water**	Analysis Method
		EAP/DPHE/W2/GW_01		
		Water Distribution Zone: 2W, D5, B block Camp: 2W, Uldhiya Mega Camp		
		21.20827°N 92.15858°E		
pH*	-	6.7	6.5-8.5	Multimeter
Electrical Conductivity (EC)*	µs/cm	185.4	NYS	Multimeter
Total Dissolved Solids (TDS)*	mg/L	125.4	1000	Multimeter

Note

** The Standards for Inland Surface Water have been taken from the Environmental Conservation Rules, 1997 which was amended on 19th July 2005 vide S.R.O. No. 229-Law/2005.

NYS: Not Yet Standardized

Sample Location and ID	Sample Site Description
Water Distribution Zone: 2W, D5, B block Camp: 2W, Uldhiya Mega Camp (EAP/DPHE/W2/GW_01)	<ul style="list-style-type: none"> ➤ The depth of the Tube well is 100 ft. ➤ The source was installed in 2017. ➤ The water is mainly using for drinking and bathing purposes ➤ Septic Tank is about 40m far from the sampling location.



Saiful Islam Imran
Test Performed By:
Saiful Islam Imran
Jr. Environmental Specialist



Tonmoy Pandit
Checked By:
Tonmoy Pandit
Deputy Manager

Development Solutions Consultant Ltd.

House# 734 (5-B), Road# 10, Avenue# 04
DOHS Mirpur, Dhaka-1216, Bangladesh. Tel: +8801822857548
Email: dscl@dsclbd.com Web: www.dsclbd.com

	Government of the People's Republic of Bangladesh Office of the Chief Chemist Department of Public Health Engineering Central Lab, 38-39, Mohakhali C/A, Dhaka-1212 Phone: 88-02-9881927, Fax: 88-02-9882003, Email: wqmsc_central_lab@yahoo.com	
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Lab Memo: 309/ CC, DPHE, CL, Dhaka.

Date: 21/01/2020

Physical /Chemical/ Bacteriological Analysis of Water Sample


Sample Id: CEN202001027	Sample Receiving Date: 16/01/2020
Ref. Memo No: DSCL/2020/NII & Dated:21-01-2020	Sample Source: Ground Water
Sent by: Saiful Islam Imran, Junior Environmental Specialist, DSCL, Mirpur DOHS, Dhaka-1216	Dist: Cox' s Bazar; Upz: Ukhiya
Care Taker: EAP/DPHE/W2/GW_01	Union: Vill: Ukhiya mega camp
Sample Collection date: 15/01/2020	Date of Testing: 16/01/2020-21/01/2020

LABORATORY TEST RESULTS:

Sl. #	Water quality parameters	Bangladesh Standard	Concentration present	Unit	Analysis Method	LOQ
1	Iron (Fe)	0.3-1	0.15	mg/L	AAS	0.05
2	Arsenic (As)	0.05	0.001	mg/L	AAS	0.001
3	Manganese	0.1	0.46	mg/L	AAS	0.03
4	Chloride	150-600	17	mg/l	Titrimetric	-
5	Total Coliform	0	0	N/100 ml	MFM	-
6	Fecal Coliform	0	0	N/100 ml	MFM	-

Comments: Sample was collected & Supplied by client.

N.B: UVS- UV-Visible Spectrophotometer, CRM-Closed Reflex Methods, LOQ - Limit of Quantitation.

Test Performed by: 1.) Name: Md. Saiful Alam Khosru Designation: Sample Analyzer  2.) Name: Taslima Akhter Designation: Sample Analyzer 	Countersigned/Approved by: 1.) Name: Md. Zahidul Islam Miah Designation: Senior Chemist  2.) Name: Md. Biplob Hossain Designation: Chief Chemist  Md. Biplob Hossain Chief Chemist Department of Public Health Engineering Central Laboratory Mohakhali, Dhaka.
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Tel: 58154273-4, 8128258-9
Fax: 880-2-9141234
E-mail: wqtl@ngof.org
Website: www.ngof.org

Water Quality Testing Laboratory



Drink Safe Water Save Life

Chemical/Bacteriological/Physical Analysis of Water Samples

WQTL Code: CB-22

Ref.: WQTL/209 - 122/20

Date: 10-February-20

Lab Code: CB22-2/6

Date of Sample Receiving: 03-February-20

Sample(s) Sent By: Thesis Purpose, Dr. Mahammed Mosharrarf Hossain - Teknaf,
Cox's Bazar

General Information of Samples:

Technology/Sample Source: Shallow Tube Well

Tested parameters: TC, FC, pH, TDS, Chloride

Union: Shamlapur

Camp: Capm-23

Upazila: Teknaf

District: Cox's Bazar

TEST RESULTS

Sample Code: Site-1, Ground Water

Name of Parameters	Concentration Present	Drinking Water Quality Standard (ECR '97 – Bangladesh)	Unit
TC	0	0	#/100mL
FC	0	0	#/100mL
pH	7.8	6.5 - 8.5	-
TDS	366	1,000	mg/L
Chloride	183	150 - 600*	mg/L

Note: Samples were collected in our prescribed container and received in sealed condition.

Report prepared and checked by –

Saleh Uddin Mahmud

Saleh Uddin Mahmud
Chemist

Tel: 58154273-4, 8128258-9
Fax: 880-2-9141234
E-mail: wqtl@ngof.org
Website: www.ngof.org

Water Quality Testing Laboratory



Drink Safe Water Save Life

Chemical/Bacteriological/Physical Analysis of Water Samples

WQTL Code: X-37

Ref.: WQTL/209 - 121/20

Date: 17-Feb-20

Sample Code: X37-2/6

Date of Sample Receiving: 5-Feb-20

Sample(s) Sent By: Thesis -

General Information of Samples:

Technology/Sample Source: **Shallow Tube Well**

Tested parameters: **Arsenic, Iron & Manganese**

Camp: 23

Union: **Shamlapur**

Upazila: **Teknaf**

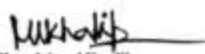
District: **Cox's Bazar**

Location of Water Point : **Site-1, Ground Water**

TEST RESULTS

Name of Parameters	Concentration Present	Drinking Water Quality Standard (ECR '97 – Bangladesh)	Unit
Arsenic	<0.003	0.05	mg/L
Iron	0.2	1.0	mg/L
Manganese	0.1	0.1	mg/L

Report Prepared & Checked by -


Md. Ibrahim Khalil
Sr. Chemist



S. M. Shahidullah
Manager



NGO FORUM
FOR PUBLIC HEALTH
61, Road 1, Lalmatia, Dhaka 1217, Bangladesh

Tel: 88154273-4, 8128258-9
Fax: 880-2-9141234
E-mail: wqtl@ngof.org
Website: www.ngof.org

Water Quality Testing Laboratory



Drink Safe Water Save Life

Chemical/Bacteriological/Physical Analysis of Water Samples

WQTL Code: CB-22

Ref.: WQTL/209 - 122/20

Date: 10-February-20

Lab Code: CB22-4/6

Date of Sample Receiving: 03-February-20

Sample(s) Sent By: Thesis Purpose, Dr. Mahammed Mosharraf Hossain - Teknaf,

Cox's Bazar

General Information of Samples:

Technology/Sample Source: Shallow Tube Well

Tested parameters: TC, FC, pH, TDS, Chloride

Union: Shamlapur

Upazila: Teknaf

Camp: Capm-23

District: Cox's Bazar

TEST RESULTS

Sample Code: Site-2, Ground Water

Name of Parameters	Concentration Present	Drinking Water Quality Standard (ECR '97 – Bangladesh)	Unit
TC	0	0	#/100mL
FC	0	0	#/100mL
pH	7.8	6.5 - 8.5	-
TDS	458	1,000	mg/L
Chloride	244	150 - 600*	mg/L

Note: Samples were collected in our prescribed container and received in sealed condition.

Report prepared and checked by –

Saleh Uddin Mahmud
Chemist

Tel: 58154273-4, 8128258-9
Fax: 880-2-9141234
E-mail: wqtl@ngof.org
Website: www.ngof.org

Water Quality Testing Laboratory



Drink Safe Water Save Life

Chemical/Bacteriological/Physical Analysis of Water Samples

WQTL Code: X-37

Ref.: WQTL/209 - 121/20

Date: 17-Feb-20

Sample Code: X37-4/8

Date of Sample Receiving: 5-Feb-20

Sample(s) Sent By: Thesis

General Information of Samples:

Technology/Sample Source: **Shallow Tube Well**

Tested parameters: **Arsenic, Iron & Manganese**

Camp: 23

Union: **Shamlapur**

Upazila: **Teknaf**


District: **Cox's Bazar**

Location of Water Point : **Site-2, Ground Water**

TEST RESULTS

Name of Parameters	Concentration Present	Drinking Water Quality Standard (ECR '97 – Bangladesh)	Unit
Arsenic	<0.003	0.05	mg/L
Iron	0.18	1.0	mg/L
Manganese	<0.1	0.1	mg/L

Report Prepared & Checked by -


Md. Ibrahim Khalil
Sr. Chemist



S. M. Shahidullah
Manager



NGO FORUM
FOR PUBLIC HEALTH
4/6, Block 5, Lalmata Chow (107) Bangladesh

Tel: 58154273-4, 8128258-9
Fax: 880-2-9141234
E-mail: wqtl@ngof.org
Website: www.ngof.org

Water Quality Testing Laboratory



Drink Safe Water Save Life

Chemical/Bacteriological/Physical Analysis of Water Samples

WQTL Code: CB-22

Ref.: WQTL/209 - 122/20

Date: 10-February-20

Lab Code: CB22-6/6

Date of Sample Receiving: 03-February-20

Sample(s) Sent By: Thesis Purpose, Dr. Mahammed Mosharrarf Hossain - Teknaf,

Cox's Bazar

General Information of Samples:

Technology/Sample Source: Shallow Tube Well

Tested parameters: TC, FC, pH, TDS, Chloride

Union: Shamlapur

Upazila: Teknaf

Camp: Capm-23

District: Cox's Bazar

TEST RESULTS

Sample Code: Site-3, Ground Water

Name of Parameters	Concentration Present	Drinking Water Quality Standard (ECR '97 – Bangladesh)	Unit
TC	280	0	#/100mL
FC	200	0	#/100mL
pH	7.9	6.5 - 8.5	-
TDS	457	1,000	mg/L
Chloride	244	150 - 600*	mg/L

Note: Samples were collected in our prescribed container and received in sealed condition.

Report prepared and checked by –

Saleh Uddin Mahmud
Chemist

Tel: 58154273-4, 8128258-9
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Water Quality Testing Laboratory



Drink Safe Water Save Life

Chemical/Bacteriological/Physical Analysis of Water Samples

WQTL Code: X-37

Ref.: WQTL/209 - 121/20

Date: 17-Feb-20

Sample Code: X37-8/8

Date of Sample Receiving: 5-Feb-20

Sample(s) Sent By: Thesis -

General Information of Samples:

Technology/Sample Source: **Shallow Tube Well**

Tested parameters: **Arsenic, Iron & Manganese**

Camp: 23

Union: **Shamlapur**

Upazila: **Teknaf**

District: **Cox's Bazar**

Location of Water Point : **Site-3, Ground Water**

TEST RESULTS

Name of Parameters	Concentration Present	Drinking Water Quality Standard (ECR '97 – Bangladesh)	Unit
Arsenic	<0.003	0.05	mg/L
Iron	0.1	1.0	mg/L
Manganese	<0.1	0.1	mg/L

Report Prepared & Checked by -


Md. Ibrahim Khalil
Sr. Chemist



S. M. Shahidullah
Manager



**NGO FORUM
FOR PUBLIC HEALTH**
4/1, Block-1, Lalmatia Dhaka-1217 Bangladesh



GLOBAL ENVIRONMENT
CONSULTANTS LTD.

House – 3/E, South Kailyanpur, Dhaka -1207

GECL LABORATORY ANALYSIS REPORT
ON
SOIL TEST (CONSTRUCTION PHASE)

Project Name : Construction & Operation of Mini Piped Water Supply System (5 Scheme).
Project Address : Cox Bazar Project, Ukhiya, CTG, Bangladesh.

Description of sample : Soil quality analysis report at project different location.

Sample Location, ID & Name with GPS Coordinate:

SL1 - Camp-13.3, Block-F-1, Hilltop, Taznimarkhola, Thaingkhali, Ukhiya. (GPS Coordinate: N- 21° 10.828' & E - 92° 08.422')

SL2 - Camp-13.4, Block-C-16, Hilltop, Taznimarkhola, Thaingkhali, Ukhiya (GPS Coordinate: N- 21° 10.694' & E - 92° 08.315')

SL3 - KRC-1, Block-F, Demander Mor, Kutupalog, Ukhiya (GPS Coordinate: N- 21° 12.664' & E - 92° 09.817')

SL4 - KRC-2, Block-C, Anser Bareck, Kutupalog, Ukhiya (GPS Coordinate: N- 21° 12.618' & E - 92° 09.908')

SL5 - Camp-8.2W, Block-I-20, Balukhali-1, Ukhiya (GPS Coordinate: N- 21° 11.830' & E - 92° 09.226')

Sample collector: Global Environment Consultants Ltd. (GECL Monitoring Team).

Sampling date : November 16, 2019

Reporting date : November 22, 2019

Description of analysis

Soil Quality Parameters Analysis										
SN	Parameters	Unit	Analysis Method	DoE (Bangladesh Standard)	Reference level (China)	Concentration Present				
						SL1	SL2	SL3	SL 4	SL 5
1	Nitrogen (N)	g/Kg	Kjeldahl method	NF	1.25	1.63	1.35	1.52	1.75	1.92
2	Phosphate (PO ₄ ⁻³)	g/Kg	Sodium bicarbonate extraction with UV-Visible method	NF	2.0	1.42	1.49	1.52	1.61	1.68
3	Oil and Grease	mg/Kg	Solvent extraction method	NF	NF	0.35	0.4	0.6	0.4	0.7
4	Organic Matter	g/kg	H ₂ O ₂ digestion with ignition method	NF	24.6	13.2	13.8	14.1	13.3	16.7

SL- Sample Location, * Based on the TP level=0.67 g/kg

Appendix IV: Compliance Monitoring

Checklist- Mini Pipe Water Supply Packages

No.	Aspects of Environmental issues	Compliance Status			Remarks
		FC	PC	NC	
A.	General				
1.	Legal working hours approval	✓			The workers work 10 hours a day at site including 1.5-hour lunch break. Sometimes worker taking rest if they feel bored due to work.
2.	Employment Record keeping arrangement	✓			The employment records are kept in a register book manually every day in the field.
3.	Payment Record keeping arrangement	✓			The payment records are kept in a register book manually every day in the field.
4.	Environment, Health and Safety Officer designated			✓	Environmental Health and Safety Officer yet to appoint.
5.	Provision for monthly meeting for inspection of site activities		✓		Meetings are held on working progress, environmental compliance and future planning periodically during mission.
B.	Health and Sanitation				
Occupational Health					
1.	First-Aid Box availability at work sites	✓			A well-equipped first aid box is available at the site
2.	Provision of personal protection equipment's (PPEs)		✓		Site Engineers, supervisors and workers are provided with PPEs including vests, helmets, safety boots etc.
3.	Handling of cement and other hazardous materials by workers		✓		Try to use Nonhazardous materials. Hazardous and Non-Hazardous materials were collected by a separate waste bin. Fuel drums are stored in the designated area.
4.	Workers' complains taken care of by the supervisor		✓		Planning to appoint a supervisor for the workers is appointed to take care of the worker's problems and receiving complaints from the workers and solving those problems accordingly.
5.	Children below 15 employment	✓			There is no below 15 children working in the site
C.	Environmental Pollution				
Dust and emission control					
1.	Construction vehicles and machineries maintained properly to reduce emissions		✓		Try to maintain the vehicles and machineries with least pollution.
2.	Proper storage of materials and regular watering.		✓		The materials are stored in proper manner and watering is done when required to mitigate air pollution. Removal of dust fully is quite difficult but the project team is trying to remove by water spraying in an environmentally friendly manner.
Noise Pollution					
1.	Movement of vehicles at desired hours		✓		Heavy vehicles movements are done mostly from morning to afternoon.
2.	Noise control measures at sites		✓		Noise created due to construction and heavy machineries affects less on the surrounding household because the construction site is in surrounded by barrier and noise source kept away from the settlement area.
Water Pollution					
1.	Wastes, cement, effluents and junks not disposed in water			✓	Some wastes are disposed in water. Proper measures are taken for preventing rain wash. However, due to heavy rainfall, some rain

No.	Aspects of Environmental issues	Compliance Status			Remarks
		FC	PC	NC	
					runoff already occurred. In future more precaution will be taken to prevent this.
Flora and Fauna					
1.	Trees and bushes outside the construction area preserved from damages		✓		Trees and bushes in the construction area is cleared during pre-construction phase. Vegetation outside of the working area is not affected. However, plantation programme will be commenced during site reinstatement as part of environmental enhancement.
2.	Disturbance to terrestrial fauna minimized	✓			The camp site has no significant terrestrial fauna; few birds, mouse, snake etc. are identified there which are not affected by the project works. Workers are instructed not to hurt any wildlife if they encountered in the construction site.
Waste Management					
1.	Construction wastes are removed off site regularly		✓		The wastes are kept in a specific place and they are removed off site regularly in an environmentally friendly manner.
2.	Chemical wastes, if any, collected and disposed of properly	✓			Chemical used for water purification is stored offsite in the chemical storage safely. During the monitoring period, no incident of chemical spills is seen.
D. Environmental documents at Field Office and Project sites					
1.	Field Office possesses copies of EMP, contract document and Technical Specifications	✓			All the documents are kept in the field office.
2.	Heavy equipment maintenance records	✓			In the mini pipe packages, no heavy equipment is required except mechanical drilling rig which is checked regularly. The maintenance records are yet to be kept at site.