SFG1782 V1

College Education Development Project (CEDP)

Environmental Management Framework

National University

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Executive Summary

The Government of Bangladesh (GoB) with the support of the World Bank intends to improve the quality and relevance of tertiary college education in Bangladesh for enhanced employability of graduates and to strengthen the management system of the college education subsector through the proposed College Education Development Project (CEDP). The total IDA financing for this project would be US$100 million, under the Investment Project Financing (IPF) instrument, of which US$ 10 million will be transaction-based and US$ 90 million on the achievement of the agreed performance targets (Disbursement-Linked Indicator, DLI). The proposed project may finance rehabilitation/renovation/ refurbishment of existing building, classrooms, science and computer laboratory facilities and establish fiber optic cable connectivity provided by BdREN. The small-scale civil works are not anticipated to cause any major adverse environmental impact and hence the intervention can be classified as "Category B" project requiring limited impact assessment. The project has triggered the World Bank Safeguard Policy OP/BP 4.01- Environment Assessment. Since the physical intervention and detailed design of the infrastructure for the different subprojects are not known at this stage, a framework approach needs to be applied. Therefore, an EMF for CEDP has been developed to ensure compliance with the World Bank's safeguard policies under the current conditions in Bangladesh. The EMF will provide the necessary background for environmental considerations, a checklist of potential environmental issues of the project activities to be considered and built into the design of the project so that environmentally sustainable implementation can take place.

The proposed Institutional Development Grant (IDG) program under the project would support the implementation of Institutional Development Plans (IDP) in each participating institution under several windows which includes upgrading and modernizing basic teaching-learning facilities of colleges; and improving the connectivity through existing Bangladesh Research and Education Network (BdREN) (under subcomponent 2.1). The activities that may be associated with the implementation of IDG are: (i) small-scale construction of new or expansion of existing facilities (vertical expansion of existing structures); (ii) rehabilitation or renovation of existing facilities; (iii) development of laboratories or furnishing of existing laboratories, augmentation of existing laboratory facilities; (iv) excavation of trench and backfilling for laying out fiber optic cable lines; (v) horizontal directional drilling (HDD) to install fiber optic cable lines where earth excavation is not possible; (vi) handling of optical fibers etc. For the purpose of the EMF, the activities associated with CEDP have been divided into two categories: (1) activities associated with small-scale civil works and (2) activities associated with fiber optic cable connectivity. The institutions eligible for any of the above categories of activities need to perform environmental screenings for each. Annex I and II provides the screening checklist forms for the above two categories respectively.

Since the actual location of these interventions is not known during the project preparation stage, some generic positive and negative impacts and their mitigation measures have been suggested in the EMF document (Chapter 4 and Annexes III and IV). In addition to these mitigation measures, general workplace health and safety guidelines as well as fiber optic cable installation safety guidelines have also been incorporated in the document (Annexes VII and VIII)**.** If it is assessed that the environmental impacts are minimal, no IEE/EIA would be required. However, it needs to be ensured that the general ECOP for small-scale civil works and mitigation plan for fiber optic cable laying operation (Annex III and Annex IV) are included in the contractor's bidding documents so that it becomes obligatory for the contractor to adopt the EMP during execution of works. Environmental Impact Assessment (EIA) will be only required for the activities having moderate to high impacts (as mentioned above), if Environmental Screening recommends. The EIA report should clearly spell out the site specific environmental issues and their mitigation measures.

The MoE/NU will share the EMF with concerned academic institutions, Department of Environment and civil society. It will be disclosed in both Bangla and English by the MoE/NU in its CEDP website and it will also be made available at the World Bank's InfoShop. NU will also ensure that the EMF is available at the subproject level to its eligible institutions receiving IDG. Relevant subproject specific safeguard documents/mitigation plans (EMPs) prepared subsequently will also be disclosed to the public.

At the project level, the Project Coordination Unit (PCU) headed by the Project Director will take the lead in overseeing and monitoring of the implementation of subprojects and this unit will periodically supervise and monitor the safeguard implementation performance and include the progress/results in the Project Progress Report. For effective and timely implementation of environmental safeguard activities, one senior official will be designated by the NU as an environmental focal point who will be responsible for carrying out the activities as per the provisions of the EMF. In addition, NU will also assign two officials to assist the PD in EMF implementation. In order to assist the environmental focal person of the PCU in EMF implementation, an Environmental Management Consultant (EMC) will be hired by the project to assist the PCU in performing its tasks. The PCU will report on (a) compliance with measures agreed with the World Bank on the basis of the findings and results of the EA, including implementation of any EMP/ECOP,(b) the status of mitigation measures; and (c) the findings of monitoring programs.

At the subproject level, there will also be a local focal person at each of the institutions (typically a person appointed by the principal/head of the institutions) who will liaise with the focal point at NU. The local focal point will be trained and primarily responsible of filling out the screening forms and sending them to PCU for review. During project implementation, the focal person at the subproject level will be responsible for ensuring effective implementation of safeguard measures (EMPs/ECOP, etc.) in close consultation with local authorities and local communities.

The M&E unit in the PCU will monitor the environmental safeguard activities of the sub-project according to the EMF and include the information in the six-monthly monitoring report to be shared with the government and World Bank. A sample monitoring report format is provided in Annex V.

Where IDG will be used to upgrade laboratory facilities or establishing new laboratories in eligible institutions, a synchronized standard laboratory operating procedures will be developed for operating these laboratories. Safety guidelines relevant to specific types of laboratories will be developed. An outline of generic safety protocols for laboratories is provided in Annex VI. The status of laboratory safety protocol initiation will be reported along with the monitoring reports.

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Acronyms and Abbreviations

BANBEIS	Bangladesh Bureau of Educational Information and Statistics
BdREN	Bangladesh Research and Education Network
BDT	Bangladeshi Taka
BMP	Best Management Practices
BNBC	Bangladesh National Building Code
BTEB	Bangladesh Technical Education Board
CEDP	College Education Development Project
DLI	Disbursement Linked Indicator
DoE	Department of Environment
DSHE	Directorate of Secondary and Higher Education
EA	Environmental Assessment
ECA	Environmental Conservation Act
ECC	Environmental Clearance Certificate
ECOP	Environmental Code of Practice
ECR	Environmental Conservation Rules
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMP	Environmental Management Plan
GoB	Government of Bangladesh
HDD	Horizontal Directional Drilling
HEQEP	Higher Education Quality Enhancement Project
IDA	International Development Association
IDG	Institutional Development Grant
IDP	Institutional Development Plans
IEE	Initial Environmental Examinations
ILO	International Labor Organization
IPF	Investment Project Financing
MOE	Ministry of Education
MoEF	Ministry of Environment and Forest
NAEM	National Academy for Education Management
NTRCA	Nongovernment Teacher Registration and Certification Authority
NEMAP	National Environment Management Action Plan
NGO	Non Government Organization
NU	National University
OP	Operational Policy
PCR	Physical Cultural Resources
PD	Project Director
PDO	Project Development Objectives
PCU	Project Coordination Unit
PSC	Public Service Commission
RBF	Results-based Financing

ToR	Term of Reference
UGC	University Grants Commission
USD	US Dollar
WB	World Bank
WARPO	Water Resources Planning Organization

1. Introduction

1. The Government of Bangladesh with the support of the World Bank intends to improve the quality and relevance of tertiary college education in Bangladesh for enhanced employability of graduates and to strengthen the management system of the college education subsector through the proposed College Education Development Project (CEDP). This will be the first IDA assisted project of the Ministry of Education aimed at developing the tertiary college education through some specific interventions in the subsector. The total IDA financing for this project would be US$100 million, under the Investment Project Financing (IPF) instrument, of which US$ 10 million will be transaction-based and US$ 90 million on the achievement of the agreed performance targets (Disbursement-Linked Indicator, DLI). There will be indirect beneficiaries of the project which would include: (a) private sector employers who will be able to recruit better qualified college graduates; (b) GoB will be able to recruit higher quality graduates for the various public services including education (majority of school teachers are college graduates) and public administration; and (c) future generations of college graduates and teachers will benefit from the development of the college education system.

2. The National University (NU) established under an Act in 1992 is the main institution responsible for the academic management of tertiary college education system. In addition, several agencies under the Ministry of Education (MoE) e.g. Directorate of Secondary and Higher Education (DSHE), National Academy for Education Management (NAEM), Nongovernment Teacher Registration and Certification Authority (NTRCA), and Bangladesh Bureau of Educational Information and Statistics (BANBEIS) have important roles for executing various tasks for running the subsector. The Public Service Commission (PSC) is also partly involved for the teacher management of the public colleges.

3. Under the World Bank's operational policies projects financed by IDA need to comply with certain safeguard instruments formulated by the Bank. The project activities under CEDP will be required to follow the environmental legislation of the Government of Bangladesh (GoB) in addition to complying with the World Bank's safeguard policies.[1]

4. The Bank classifies the proposed project into three major categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts.

- Category A: The proposed project is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works.

- Category B: The proposed project's potential adverse environmental impacts on human population or environmentally important areas-including wetlands, forests, grasslands, or other natural habitats- are less adverse than those of Category A projects. These impacts are site specific; few if any of them are irreversible; and in most cases mitigatory measures can be designed more readily than Category A projects.

- Category C: The proposed project is likely to have minimal or no adverse environmental impacts.

[1] According to the ECR 1997 construction of multi-storied building is an Orange B category project. It is also mentioned in the ECR1997 that any engineering work (up to BDT 1.0 million) is an "Orange B" Category project. However, Ministry of Housing and Public works defines that more than 6 storied building outside Dhaka and more than 10 storied building in Dhaka city are multistoried building

5. The proposed project may finance small scale rehabilitation/renovation/refurbishment of existing building, classrooms, science and computer laboratory facilities and establish fiber optic cable connectivity provided by BdREN. The nature of environmental impacts arising from these small scale civil works will trigger safeguard policy OP/BP4.01 requiring environmental assessment which will be addressed through an Environmental Management Plan (EMP). The small-scale civil works are not anticipated to cause any major adverse environmental impact and hence the intervention can be **classified as "Category B" project** requiring limited impact assessment. Since the physical intervention and detailed design of the infrastructure for the different subprojects are not known at this stage, a framework approach needs to be applied. Therefore, an EMF for CEDP has been developed to ensure compliance with the World Bank's safeguard policies under the current conditions in Bangladesh.

6. This document provides a Framework for Environmental Assessment and Management, giving brief details of potential environmental issues typically associated with the planning and implementation of project activities envisaged under the CEDP and provide guidelines on how to carry out Environmental Screening (ES), Initial Environmental Examinations (IEE), Environmental Impact Assessment (EIA),and prepare Environmental Management Plans (EMP) to mitigate project induced negative environmental impact and enhance positive environmental impact of the project interventions. The EMF will provide the necessary background for environmental considerations, a checklist of potential environmental issues of the project activities to be considered and built into the design of the project so that environmentally sustainable implementation can take place. The EMF highlights relevant general policies, guidelines, codes of practice and procedures to be taken into consideration for integration of environmental aspects into the project design. Adhering to the principles and procedures and using the checklist of potential environmental issues laid out in this EMF will help the implementing agencies to ensure compliance with the World Bank's environmental safeguard policies and the relevant provisions under the related government's policies, and associated rules, regulations and procedures. This EMF must be used as the template and guideline to ensure diligent environmental compliance of the planning and implementation of the activities envisaged under the CEDP.

7. The specific objectives of the EMF are to:
   - Establish clear procedures and methodologies for the environmental and social planning, review, approval and implementation of subprojects to be financed under the project;
   - Evaluate the potential overall environmental impacts of the proposed project activities and suggest subproject specific standard environmental mitigation
   - Specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental concerns related to subprojects;
   - Identify the institutional barriers and determine the training, capacity building and technical assistance needed to successfully implement the provisions of the EMF; and
   - Provide practical information and resources for implementing the EMF.

2. Project Description

1. **Proposed Development Objective (PDO) and Results Framework**: The project development objective is to strengthen the strategic planning and management capacity of the college education subsector and to improve the teaching and learning environment of selected colleges. The proposed PDO, KPIs and DLIs are presented in **Annex 3**. Indicative **Key Performance Indicators (KPIs)** are presented below.

- Sector strategy and action plan developed;
- Government college teacher vacancies reduced (% of vacancies filled against the vacancies as of 2014);
- % of teachers in Honours and Masters colleges trained in subject and pedagogical training under the project; and
- Management in the selected colleges strengthened (% of grant supported colleges prepare institutional development plan and publish annual reports).

2. **Proposed Components:** The following three components and proposed activities were agreed during the mission, which will continue to be updated till completion of Appraisal of the project.

Component 1: Strengthening the strategic planning and management capacity

3. The objective of this component is to strengthen the planning and management of the college education subsector. The Component would support the implementation of the following interventions: (i) development and implementation of initial phase of Strategic Plan for the college subsector which identifies system-wide reforms in phases at the national level; and (ii) improvement of teacher recruitment and management system through filling the teacher vacancies of government colleges and establishment of an appropriate teachers selection commission for the non-government college teachers.

Sub-component 1.1: Development of a Strategic Plan for the college subsector

4. A Strategic Plan for the college subsector would provide a consensus-based plan of action providing directions and goals for the college education subsector. A recent Study on the College Sector completed in January 2014 (South Asia Human Development, Research Paper No 65) highlighted a number of sectoral issues which need attention if college graduates are to: (i) improve their employability; and (ii) contribute to the economic and social development of Bangladesh.

5. The Strategic Plan would be based on analytical background documents on significant sectoral issues to be prepared by experts from Bangladesh's public and private higher education sector and industry with support from international experts on a needs-based approach. The Ministry of Education would establish a National Strategic Planning Committee to expedite the process. Six Expert Groups would be formed provisionally by MoE with each group focusing on one cluster of issues as follows: (Group A) Vision, Size and Scope; (Group B) Access and Equity; (Group C) Quality and Relevance; (Group D) Management of the College System; (Group E) Science, Technology and ICT and (Group F) Financing of college education. Information from background documents prepared by the Expert Groups would feed into the Strategic Plan for Colleges.

6. A draft Plan would be produced for wide stakeholder consultation, followed by a Final Plan which would take outcomes of stakeholder consultations into account. The Final Plan will have a twenty-year Plan of Action set out in phases – immediate, mid-term and long-term (see Appendix 1: Briefing Note on A Strategic Plan for Tertiary College Education in Bangladesh) and be disclosed on the MoE website. Following its approval of the Strategic Plan, MoE would draft the Development Project Proposal (DPP) based on the Strategic Plan's recommended actions for the first phase and initiate the first year activities prior to the end of the Project.

Sub-component 1.2: Improvement of the teacher management system

7. Under this sub-component activities would include: (i) facilitate the process for filling up of vacancies in government colleges; and (ii) support MoE's efforts to reform the existing procedure for recruiting teachers in non-government colleges by establishing a Non-Government Teachers Selection Commission (NTSC).

8. There are 3,200 teacher vacancies as of 2014 in the government colleges. There are multiple agencies (i.e. DSHE, MoE, MoPA and Public Service Commission) involved in the process of filling the vacancies. The project would support MoE's efforts for expediting the recruitment procedure and filling the vacancies through the results based financing.

9. The recruitment of qualified teachers remain a concern in the non-government colleges. The MoE has initiated reforms in the recruitment mechanism of non-government college teachers to improve the transparency and accountability of the process. The project would support MoE's initiatives in establishing a new Non-government Teachers Selection Commission by amending the NTRCA Act.

Component 2: Improving the teaching and learning environment in selected colleges

10. The objective of this component is to improve the quality of teaching and learning of college education under the National University. Two sub-components would support the achievement of this objective: (i) Sub-component 2.1: Improving the teaching and learning environment in selected colleges; and (ii) Sub-component 2.2: Strengthening teaching and management capacity in selected colleges.

Sub-component 2.1: Improving the teaching-learning environment in colleges

11. Under this sub-component, an Institutional Development Grant (IDG) will be provided to a selected number of eligible government and non-government colleges to support the implementation of Institutional Development Plans (IDP) in the following areas: (i) Upgrading and modernizing basic teaching-learning facilities of colleges; (ii) Improving the connectivity through existing Bangladesh Research and Education Network (BdREN); (iii) Development of soft skills programs and industry-linkages (i.e. internship, job placement cell, tracer studies, etc.); and (iv) Institutional self-assessments for quality assurance.

12. The proposed competitive Grant program will be voluntary. The colleges will be grouped according to student enrollment and will participate based on eligibility criteria. An Operations Manual will be developed to assist colleges for preparing the IDP and implementing the activities included in it by utilizing the IDG. The design of the IDG will benefit from the experience of the IDA-financed two on-going projects: Skills and Training Enhancement Project (STEP) on IDP and Higher Education Quality Enhancement Project (HEQEP) on Academic Innovation Fund in Bangladesh.

Sub-component 2.2: Strengthening teaching and management capacity in colleges

13. The objective of this sub-component is to bring about qualitative improvements in teaching and management in the college subsector. This objective would be achieved through support for: (i) training of trainers; (ii) teacher training; and (iii) capacity building of college management staff. The Project would also support the development of training contents and materials. Distance learning through online platforms with international and national training providers will also be developed to reach the large number of beneficiaries.

14. Training and capacity building activities would be carried out by a *'Training Consortium'* comprising personnel from national agencies including NU, Bangladesh Open University (BOU), National Academy for Educational Management, trainers from universities, representatives from colleges, and individuals from the private sector as required. Training will focus on priority subject areas to be confirmed: physics, chemistry, botany, zoology, ICT, mathematics, statistics, economics, media and mass communications, finance/banking, marketing, accounting, tourism, hospitality, Bangla and English Language. To provide international best practice elements in the design of the training program, a partnership arrangement is envisaged with University of Nottingham, a globally ranked university.

15. Current estimates indicate that training activities would involve about 7,000 teachers from about 500 Masters and Honours colleges, 250 trainers, about 500 college principals, and 250 management personnel from various levels. To address the large numbers, delivery would be designed as a blend of online and face-to-face approaches. An online *Training Portal* would be developed to provide information on training; access to training materials and best practices; and a communication platform for the community of practice. Training will be carried out largely in Bangladesh with small groups sent for overseas training as required.

16. Key outcomes expected on completion of the training program include: (i) improvement in knowledge, skills and methodologies related to teaching and learning in priority subject areas; (ii) improvement in English Language proficiency and the use of English for Teaching purposes with similar improvement in Bangla; (iii) improvement in the use of technologies in education; (iv) developing sustainable communities of practice; (v) alignment of teaching-learning provisions across National University Colleges and to international standards of education; and (vi) development of a pool of local trainers to support sustainability of the Teacher Professional Development and Training Program and to play active supervision and mentoring roles.

Component 3: Project Management, Communication and Monitoring and Evaluation

17. The objectives of this component are to ensure sufficient system capacity for the implementation of policy interventions and effective project management in achieving its PDO. These objectives would be met through two subcomponents: (i) Project Management and Communication; and (ii) Monitoring and Evaluation (M&E).

Sub-component 3.1: Project Management and Communication

18. The objective of this sub-component is to ensure sufficient capacity for implementation of policy interventions and various activities and dissemination of information. This sub-component would support project management, including establishment of a Project Coordination Unit (PCU), specific capacity building and technical assistance necessary for project implementation, governance and accountability activities, and communication and information dissemination.

Sub-component 3.2: Monitoring and Evaluation

19. The objective of this sub-component is to build an effective M&E system. This subcomponent would support M&E activities, including DLI verification, progress reporting, satisfaction surveys, tracer studies, and effectiveness assessments on key activities. A web-based project management information system would be established. The monitoring and evaluation activities would be carried out by PCU with support from respective departments of NU and DSHE.

Project Target areas

8. The project will be implemented nationwide in selected public and private colleges providing education at the tertiary level. The National University (NU) is the largest provider of tertiary education, accounting for over 70 percent of all tertiary enrollments in over 1,600 affiliated colleges across all 64 districts in Bangladesh. The participating institutions will have to go through screening mechanism before becoming eligible for financing for any of the subprojects. Therefore, the exact location of the subprojects will be known only during the implementation of the project.

3. Policy, Legal, and Administrative Framework

9. This section of the ESMF describes relevant national environmental and social management requirements, the World Bank safeguards policies applicable to the project and its subprojects, and the gap analysis between the GoB and the World Bank policy requirements and measures for filling the gap.

General Description

10. The importance of environmental consideration related to education, construction as well as reconstruction projects has been recognized in a number of national documents that set the legal and regulatory framework for management of environment in the CEDP. The major related policies, acts, rules and plans are:

Environment

Environment Policy, 1992 and Environment Action Plan, 1992
National Environment Management Action Plan, 1995
Environmental Conservation Act (ECA) of 1995
Environmental Conservation Rules (ECR) of 1997

Occupational Health and Safety and Construction

The Bangladesh Labor Act, 2006
Bangladesh National Building Code (1993, 2006)

Environment Policy, 1992 and Environment Action Plan, 1992

11. The concept of environmental protection through national efforts was first recognized and declared with the adoption of the Environment Policy, 1992 and the Environment Action Plan, 1992. The importance of policies in beefing up the environmental regime is recognized in a number of international instruments including the World Conservation Strategy in 1980 and the Brundtland Commission Report, 1987. Paragraph 14 of Chapter 8 of Agenda 21 underscored the necessity of formulation of national policies as well as laws for environmental protection and sustainable development. The major objectives of Environmental policy are to i) maintain ecological balance and overall development through protection and improvement of the environment; ii) protect country against natural disaster; iii) identify and regulate activities, which pollute and degrade the environment; iv) ensure environmentally sound development in all sectors; v) ensure sustainable, long term and environmentally sound base of natural resources; and vi) actively remain associate with all international environmental initiatives to the maximum possible extent.

12. The National Environment Action Plan recommended sector specific action plan to achieve the objectives and implement the policy recommendations of the National Environment Policy. National Environment Policy ensures Environmental Impact Assessment (EIA) in all new projects. Adverse impact will be prevented through proper steps and adequate investments. The followings are sector relevant key recommended actions:

Education and Public Awareness

- Widespread mass awareness regarding environmental conservation and improvement, sustainable, long term and environmentally sound utilization of all resources will be created.
- Inclusion and dissemination of environmental knowledge and information in the formal and informal systems of education and media will be ensured.
- Spontaneous and direct participation of people in all environmental activities will be induced.
- Environmental issues will be incorporated in all government and non-government training programs and also in such programs for industrial and commercial workers.

Science Technology and Research

- Environmental pollution supervision and control measures will be incorporated into national science and technology policy.
- Technology will be evolved to ensure long term, sustainable and environmentally sound utilization of all resources for conservation and improvement of environment.

National Environment Management Action Plan, 1995

13. The National Environment Management Action Plan (NEMAP, 1995), based on a nationwide consultation program identified the main national environmental issues, including those related to the Education and awareness which EA practitioners should note. The main related national concerns included flood environmental degradation of water bodies, increased water pollution, shortage of irrigation water and drainage congestion; various specific regional concerns were also identified.

Bangladesh Environmental Conservation Act (ECA), 1995

14. The Environmental Conservation Act (ECA) of 1995 is the main legislative framework document relating to environmental protection in Bangladesh. This umbrella Act includes laws for conservation of the environment, improvement of environmental standards, and control and mitigation of environmental pollution. This Act established the Department of Environment (DOE), and empowers its Director General to take measures as he considers necessary which includes conducting inquiries, preventing probable accidents, advising the Government, coordinating with other authorities or agencies, and collecting& publishing information about environmental pollution. According to this act (Section 12), no industrial unit or project shall be established or undertaken without obtaining, in a manner prescribed by the accompanying Rules, an Environmental Clearance Certificate (ECC) from the Director General of DOE.

Bangladesh Environmental Conservation Rules (ECR), 1997

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

(i) Declaration of ecologically critical areas
(ii) Classification of industries and projects into 4 categories
(iii) Procedures for issuing the Environmental Clearance Certificate
(iv) Determination of environmental standards

16. The Rule 3 defines the factors to be considered in declaring an area 'ecologically critical area' (ECA) as per Section 5 of ECA'95. It empowers the Government to declare an area 'ECA', if it is satisfied that the ecosystem of the area has reached or is threatened to reach a critical state or condition due to environmental degradation. The Government is also empowered to specify which of the operations or processes shall be carried out or shall not be initiated in the ecologically critical area. Under this mandate, MOEF has declared Sunderban, Cox's Bazar-Tekhnaf Sea Shore, Saint Martin Island, Sonadia Island, Hakaluki Haor, Yanguar Haor, Marzat Baor and Gulshan-Baridhara Lake as ecologically critical areas and prohibited certain activities in those areas.

17. ECR'97 (Rule 7) classifies industrial units and projects into four categories depending on environmental impact and location for the purpose of issuance of ECC .These categories are:

- Green
- Orange A

- Orange B, and
- Red

18. All existing industrial units and projects and proposed industrial units and projects, that are considered to be low polluting are categorized under "Green" and shall be granted Environmental Clearance. For proposed industrial units and projects falling in the Orange- A, Orange- B and Red Categories, firstly a site clearance certificate and thereafter an environmental clearance certificate will be issued. A detailed description of those four categories of industries has been given in Schedule-1 of ECR'97.Apart from general requirement, for every Red category proposed industrial unit or project, the application must be accompanied with feasibility report on Initial Environmental Examination (IEE), Environmental Impact Assessment (EIA) basedon approved TOR by DOE, Environmental Management Plan (EMP) etc.

19. The ECR'97 also contains the procedures for obtaining Environmental Clearance Certificates (ECC) from the Department of Environment for different types of proposed units or projects. Any person or organization wishing to establish an industrial unit or project must obtain ECC from the Director General. The application for such certificate must be in the prescribed form together (later in this chapter) with the prescribed fees laiddowninSchedule13, through the deposit of a Treasury Challan in favor of the Director General.Rule8prescribes the duration of validity of such certificate (3 years for green category and1year for other categories) and compulsory requirement renewal of certificate at least30days before expiry of its validity.

The Bangladesh Labor Act, 2006

20. The Bangladesh Labor Act, 2006 provides the guidance of employers' extent of responsibility and workmen's extent of right to get compensation in case of injury by accident while working. Some of the relevant Sections are:

21. Section 150. Employer's Liability for Compensation:(1)If personal injury is caused to a workman by accident arising out of and in the course of his employment, his employer shall be liable to pay compensation in accordance with the provisions of this Act: Provided that the employer shall not be so liable - (a) in respect of any injury which Does not result in the total or partial disablement of the workman for a period exceeding three days; (b) in respect of any injury, not resulting in death or permanent total disablement, caused by an accident which is directly attributable to - (i) the workman having been at the time thereof under the influence of drink or drugs, or (ii) the willful disobedience of the workman to an order expressly given, or to a rule expressly framed, for the purpose of securing the safety of workmen, or (iii) the willful removal or disregard by the workman of any safety guard or other device which he knew to have been provided for the purpose of securing the safety of workmen.

22. Section 151. (1) Amount of Compensation: Subject to the provisions of this Act, the amount of compensation shall be as follows, namely :- (a) where death results an amount equal to fifty from the injury cent of the monthly wages of the deceased workman multiplied by the relevant factor; or an amount of fifty thousand rupees, whichever is more; (b) where permanent total an amount equal to disablement results from sixty the injury per cent of the monthly wages of the injured workman multiplied by the relevant factor, or an amount of sixty thousand rupees, whichever is more. (2)On the ceasing of the disablement before the date on which any half-monthly payment falls due, there shall be payable in respect of that half-month a sum proportionate to the duration of the disablement in that half-month.

Bangladesh National Building Code, 2006

23. Part-7, Chapter -1 of the Bangladesh National Building Code (BNBC) clearly sets out the constructional responsibilities according to which the relevant authority of a particular construction site shall adopt some precautionary measures to ensure the safety of the workmen. According to section 1.2.1 of chapter 1 of part 7, "In a construction or demolition work, the terms of contract between the owner and the contractor and between a consultant and the owner shall be clearly defined and put in writing. These however will not absolve the owner from any of his responsibilities under the various provisions of this Code and other applicable regulations and bye-laws. The terms of contract between the owner and the contractor will determine the responsibilities and liabilities of either party in the concerned matters, within the provisions of the relevant Acts and Codes (e.g.) the Employers' Liability Act, 1938, the Factories Act 1965, the Fatal Accident Act, 1955 and Workmen's Compensation Act 1923". (After the introduction of the Bangladesh Labor Act, 2006, these Acts have been repealed).

24. Section 1.4.1 of chapter-1, part-7 of the BNBC, states the general duties of the employer to the public as well as workers. According to this section, "All equipment and safeguards required for the construction work such as temporary stair, ladder, ramp, scaffold, hoist, run way, barricade, chute, lift etc. shall be substantially constructed and erected so as not to create any unsafe situation for the workmen using them or the workmen and general public passing under, on or near them".

25. Part-7, Chapter-3 of the Code has clarified the issue of safety of workmen during construction and with relation to this, set out the details about the different safety tools (PPE) of specified standard. In relation with the health hazards of the workers during construction, this chapter describes the nature of the different health hazards that normally occur in the site during construction and at the same time specifies the specific measures to be taken to prevent such health hazards. According to this chapter, exhaust ventilation, use of protective devices, medical checkups etc. are the measures to be taken by the particular employer to ensure a healthy workplace for the workers.

26. To prevent workers falling from heights, the Code in section 3.7.1 to 3.7.6 of chapter 3 of part 7 sets out the detailed requirements on the formation and use of scaffolding. According to section 3.9.2 of the same chapter, "every temporary floor openings shall either have railing of at least 900 mm height or shall be constantly attended. Every floor hole shall be guarded by either a railing with toe board or a hinged cover. Alternatively, the hole may be constantly attended or protected by a removable railing. Every stairway floor opening shall be guarded by railing at least 900 mm high on the exposed sides except at entrance to stairway. Every ladder way floor opening or platform shall be guarded by a guard railing with toe board except at entrance to opening. Every open sided floor or platform 1.2 meters or more above adjacent ground level shall be guarded by a railing on all open sides except where there is entrance to ramp, stairway or fixed ladder….. the above precautions shall also be taken near the open edges of floors and roofs".

27. The major challenge is the proper implementation of the Code as section 2.1 of chapter 2 of part 1 duly states that, "The Government shall establish a new or designate an existing agency responsible for the enforcement of this Code with a given area of jurisdiction. For the purpose of administering and enforcing the provisions of the Code, the enforcing agency shall have the authority of the Government and shall herein be referred to as the Authority."

28. Part 9, 1.2.1 states that if the land is changed and the occupants of the area are against the change, no change in use of an existing building will allowed.

29. Section 1.2.3 of Part-9 also states that in case of partial changing of a building, fire resistance should be ensured and all provisions with greater public safety should be applied to the entire building of the structure.

30. Section 1.2.4 of Part 9 clearly states "Additions to existing building shall comply with all of the requirements of the BNBC for new constructions. The combined height and area of the existing building and the new addition shall not exceed the height and open space requirements for new building specified in Part 3 of the Code. Where a fire wall that complies with Table 3.3.1 of Part 3 is provided between the addition and the existing building, the addition shall be considered as a separate building."

Implications on the project

31. It is the responsibility of the respective implementing agencies to screen, take mitigation measures and monitor the environmental issues in both construction and Operation & Maintenance phase. Other than reconstruction/refurbishment/extension of existing building, any other environment threatening significant work is not expected from the CEDP.

32. Projects and programs financed with IDA resources need to comply with the World Bank Operational Policies.[2] Therefore, the project components eligible for funding under CEDP will be required conformity with environmental legislation of the Government of Bangladesh (GOB) in addition to satisfy the World Bank's safeguard policies. According to the ECR'97 construction of multi-storied building is an Orange B category project. It is also mentioned in the ECR'97 that any engineering works (up to 10 hundred thousand Taka) is an "Orange B" Category project. But in practice, construction of buildings or small-scale civil activities does not seek any clearance from DoE in Bangladesh and hence no IEE or any other environmental assessment reports are submitted for these types of works. For the same reason, the probable project activities associated with CEDP (small-scale construction, excavation and backfilling associated with fiber optic cable laying etc.) might not require a formal approval from DoE or a clearance certificate. However, since environmental assessment is a requirement as per World Bank guidelines, environmental screening will be done and mitigation measures will be specified for all subprojects which involve these activities. If screening finds that the impacts are minor, then an EMP outlining the implementation procedure and monitoring of those mitigation plans would be deemed sufficient. The screening reports and EMP will be documented and made available to the DoE if they wish to review or monitor project activities. On the other hand if initial screening suggests that there are significant negative environmental impacts from the small-scale sub-projects; the implementing agency will have to conduct a detailed EIA and EMP will be prepared after the EIA. However, this is very much unlikely for the CEDP.

[2] GoB Acts and Rules on environment protection can be accessed through the following website: http://www.doe.gov.bd/law/law.php?cmd=list&type=rules

World Bank's Environmental Safeguards Policy

33. The Bank requires Environmental Assessment (EA) and Social Assessment of projects proposed for Bank financing to help ensure that they are both socially and environmentally sound and sustainable, and thus to improve decision making. The World Bank's environmental assessment policy and recommended processing are described in Operational Policy (OP)/Bank Procedure (BP) 4.01: Environmental Assessment. This policy is considered to be the umbrella policy for the Bank's environmental "safeguard policies" which among others include: Natural Habitats (OP 4.04), Forests (OP 4.36), Pest Management (OP 4.09), Physical Cultural Resources (OP 4.11)), and Safety of Dams (OP 4.37). Operational Policies (OP) is the statement of policy objectives and operational principles including the roles and obligations of the Borrower and the Bank, whereas Bank Procedures (BP) is the mandatory procedures to be followed by the Borrower and the Bank. OP/BP 4.01 issued in January 1999, is the central documents that defines the Bank's environmental assessment requirements. Following are the WB's environmental and social/resettlement guidelines:

34. Environmental Policies
    OP 4.01 Environmental Assessment
    OP 4.04 Conservation of Natural Habitats
    OP 4.09 Pest Management
    OP 4.36 Forestry
    OP 4.37 Safety of Dams

35. Social Policies
    OP 4.11 Safeguarding Cultural Property in IFC Financed Projects
    OP 4.12 Involuntary Resettlement
    OP 4.10 Indigenous Peoples

36. Legal policies
    OP 7.50 Projects on International Waterways
    OP 7.60 Disputed Areas

The most relevant policies of WB in CEDP activities is OP 4.01 Environmental Assessment

OP 4.01 Environmental Assessment

37. EA is a process whose breadth, depth, and type of analysis depend on the nature, scale, and potential environmental impact of the proposed project. EA evaluates a project's potential environmental risks and impacts in its area of influence; examines project alternatives; identifies ways of improving project selection, siting, planning, design, and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts; and includes the process of mitigating and managing adverse environmental impacts throughout project implementation.

Implications on the project.

38. As mentioned earlier, projects and programs financed with IDA resources need to comply with the World Bank Operational Policies. The probable type of activities associated with CEDP would be small-scale civil works and rehabilitation works with very low environmental impacts. The project may be designated as **Category "B"** because of its minimal environmental impacts. Environmental screening will be done and mitigation measures will be specified for all subprojects which involve these activities. If screening finds that the impacts are minor, then an EMP outlining the implementation procedure and monitoring of those mitigation plans would be deemed sufficient. If initial screening suggests that there are significant negative environmental impacts from the small-scale sub-projects; the implementing agency will conduct a detailed EIA and EMP will be prepared after the EIA.

4. Potential Project Impacts and Mitigation Measures

39. The proposed Institutional Development Grant (IDG) program would support the implementation of Institutional Development Plans (IDP) in each participating institution under several windows which includes upgrading and modernizing basic teaching-learning facilities of colleges; and improving the connectivity through existing Bangladesh Research and Education Network (BdREN) (under subcomponent 2.1). The activities that may be associated with the implementation of IDP are: (i) small-scale construction of new or expansion of existing facilities (vertical expansion of existing structures); (ii) rehabilitation or renovation of existing facilities; (iii) development of laboratories or furnishing of existing laboratories, augmentation of existing laboratory facilities; (iv) excavation of trench and backfilling for laying out fiber optic cable lines; (v) horizontal directional drilling (HDD) to install fiber optic cable lines where earth excavation is not possible; (vi) handling of optical fibers etc. Since the actual location of these interventions is not known during the project preparation stage, some generic positive and negative impacts and their mitigation measures are suggested below.

Potential Impacts during Construction/Rehabilitation/Renovation

Drainage congestion:

40. During execution of civil engineering projects, temporary drainage congestion often results from obstruction to natural flow of drainage water due to the storage of materials, piled up excavated material/ soil, and temporary embankments constructed to keep the work area dry. Such congestion is particularly important at the project sites adjacent to low-lying areas. Drainage congestions could create significant discomfort to people living in project-surrounding areas.

Noise pollution:

41. For fiber optic cable installation there will be no long-term impacts on noise levels. During construction, minor short-term noise impacts will be incurred due to operation of the HDD equipment or other construction equipment. The traffic-related noise at the area of construction is also not expected to exceed the prevailing baseline noise levels. For small-scale civil works noisy environment may prevail for several days (common activities such as drilling, concrete mixing, tiles-cutting, aggregate-crushing etc.).

Air pollution

42. Small-scale civil works activities may generate a significant amount of dust in the vicinity of the working areas. The dust may be generated due to demolition of small structures (e.g. walls), earthwork activities, uncovered stockpile of construction materials. Impacts to air quality associated with the proposed fiber optic cable installation and small-scale civil works are limited to temporary and incidental increases in particulate matter (fugitive dust) during construction. Temporary traffic disruption may cause increased motor vehicle exhaust. Construction equipment, which uses fossil fuel, will cause a short-term increase in GHG emissions into the air and potentially create additional dust. With typical mitigation measures and Best Management Practices (BMP), construction will have no long-term impacts to air quality and short-term impacts will be minimized.

Water pollution

43. Water pollution may result from discharge of water containing eroded soil (high suspended solids), spills and leaks of oils/ chemical and construction waste into nearby water bodies (e.g., drain, pond, khal, drain, river). The presence and existing use of water bodies surrounding the sub-project site would determine the level of impact. For example, if a pond located close to a sub-project site is being used for washing/ bathing or for fish culture, pollution of the pond from sub-project activities would generate significant adverse impacts. Water pollution may occur if the workers involved in the construction activities are not provided provisions of adequate sanitary facilities.

Environmental pollution from solid/ construction waste

44. In some sub-projects, construction debris is likely to be generated from different sub-project activities. Improper management of construction debris and solid waste could cause blockage of drainage line/ path and environmental pollution.

Disruption of flora and fauna

45. Major expansion of existing building, classrooms, laboratories disrupts the existing ecology and natural system of the locality. Wild animals like foxes, jackals, snakes, frogs, etc. have to leave the area. Tree felling may be required to clear the site for building expansion. Live vegetation will be disrupted. Water bodies are sometimes filled, which causes destruction of plants grown under water.

Traffic congestion

46. Installation of fiber optic cable lines in densely populated areas, and construction of fiber optic cable lines along busy highway could aggravate the existing traffic problem during construction phase. This should be addressed with proper traffic management, and avoiding stockpiling of materials in a way that could hamper traffic movement. traffic congestion during small-scale civil construction and renovation works are not likely.

Health and safety

47. Construction activities in densely populated areas and along narrow roads (e.g. during installation of optical fiber lines within city areas) could increase risks to pedestrian and vehicular movement. Safety/ stability of structures (buildings, walls) located very close to the alignment of fiber optic cable lines could be an important issue, especially during construction of optical fiber lines along narrow roads. Besides this, workers involved in fiber optic cable installation or repair may be at risk of permanent eye damage due to exposure to laser light during cable connection and inspection activities. When extending a cable or mounting a cable connector, a microscope is typically attached to the end of the fiber optic cable allowing the worker to inspect the cable end and prepare the thin glass fibers for extension or connection assembly. Workers may also be exposed to minute or microscopic glass fiber shards that can penetrate human tissue through skin or eyes, or by ingestion or inhalation. Optical fiber installation activities may also pose a risk of fire due to the presence of flammable materials in high-powered laser installation areas.

Employment and Commercial Activities

48. Construction and installation activities would provide some relatively small, temporary increases in income and employment in the sub-project area. For example, labor-intensive sub-project works (e.g., manual excavation) could generate employment for considerable number of semi-skilled workforce. These job opportunities would be located in different areas as the work progresses. However, given the size of the labor force in the project area and in surrounding areas, most jobs could be filled by residents of the general area where the work is located except perhaps for a few specialized tasks. Additional facilities for workers (camps, water supply and sanitation, solid waste management) will not be required. Therefore, there likely would be no adverse impacts on community services, schools, housing, or other local services and facilities.

Safeguarding physical cultural resources (PCR)

49. Since activities might involve earthwork and the exact locations of the sub-projects to be implemented are not known at this moment, a guideline for "Chance Find" procedure for protection of cultural property is presented in Annex III (ECOP 12), following the World Bank Operational Policy OP 4.11 (Physical cultural resources).

Potential Impacts during Operation

Water Logging

50. Due to improper planning and construction, storm water drainage congestion / water logging may be created. This may affect commercial activities in the market and cause potential risk to community health. Detrimental effect may cause on the paved/road surfaces in the market areas.

Surface Water Pollution

51. Nearby water body may be polluted due to disposal of material wastes obtained from the laboratories.

Utilities requirement

52. Expansion of existing building, classrooms, and laboratories creates facility for more people and consequently increases demand for electricity and other form of energy, and requires provision for water supply and sanitation. The existing building's infrastructure needs to be assessed and expanded (if necessary). Lack of O&M of the environmental utilities will create nuisance. Regular cleaning person of the utilities (sweepers) should be appointed.

Internet Connectivity

53. Due to connectivity with BdREN, the participating institution will be connected to high quality resources for education purposes. This will improve the overall quality of education as stated in the Project Development Objectives.

Impact Assessment

54. Considering the nature and magnitude of potential environmental impacts from relatively limited scale of the renovation/refurbishing of infrastructure, the proposed operation is to be classified as category 'B'. Since the physical intervention and detail design of reconstruction works are not known at this stage and may not be known at appraisal, the requirement to carry out an environmental analysis as part of project preparation can be waived but, for subprojects with potential adverse impacts, a limited environmental analysis/screening will be done during project implementation prior to approval of any sub-project for implementation.

Mitigation Measures

55. The proposed mitigation measures during construction phase have been divided into two parts: (a) mitigation measures for small-scale civil works (b) mitigation measures for activities associated with fiber optic cable laying operation. Mitigation measures for small-scale civil works are described as Environmental Code of Practices and are delineated in Annex III. The Environmental Codes of Practice (ECOP) is prepared to manage small environmental impacts during construction. The ECOPs will apply to manage small scale infrastructure investments subproject. ECOP will be a mandatory part of construction contract or bidding documents so that contractor complies with environmental covenants. PCU and construction supervisors will be responsible for monitoring of compliance with ECOP and preparing the required reports. The mitigation measures associated with fiber optic cable installation are summarized in Annex IV. These mitigation measures will also have to be adopted by the Contractor in a similar way as the ECOPs wherever applicable.

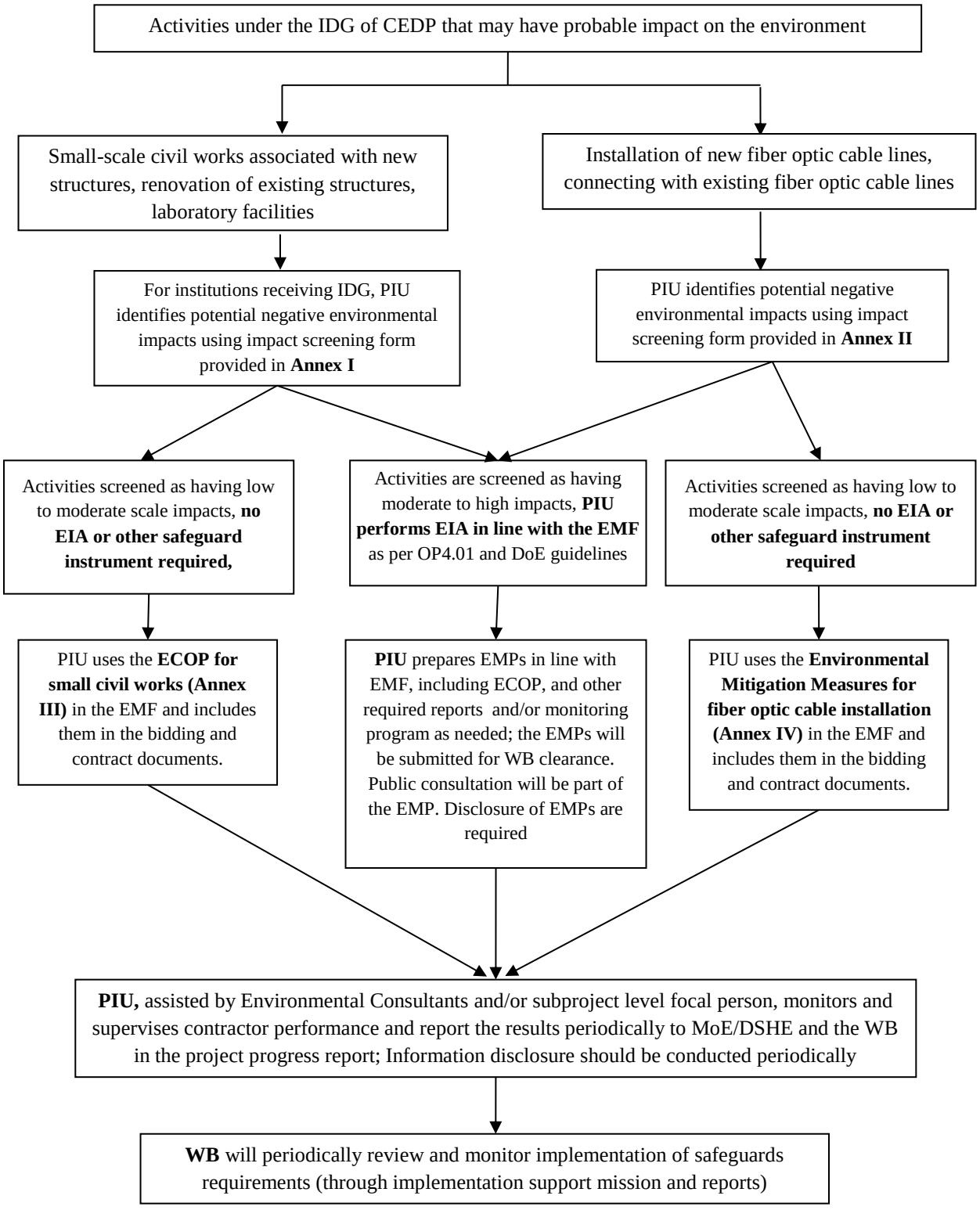
5. Screening, Assessment and Safeguard Instruments

56. Using the major steps outlined below, this section of the EMF describes the process for ensuring that environmental concerns are adequately addressed through the institutional arrangements and procedures used by the project for managing the identification, preparation, approval, and implementation of subprojects. This section of the EMF can be divided into the following subsections: (i) safeguard screening and impact assessment; (ii) development of mitigation measures; (iii) review, approval, and disclosure of subproject safeguards instruments; and (iv) implementation, monitoring, supervision, and reporting.

Safeguard Screening and Impact Assessment

57. Key steps in subproject preparation during project implementation are safeguard screening and impact assessment. Key potential negative impacts on the environment and local community will be screened for pre-construction, construction, and operation phases. In this regard, the activities of the CEDP have been divided into two categories: (1) activities associated with small-scale civil works and (2) activities associated with fiber optic cable connectivity. The institutions eligible for any of the above categories of activities need to perform environmental screenings for each. Annex I and II provides the screening checklist forms for the above two categories respectively. There can be two possible outcomes from the environmental screenings: (1) the assessed impacts have a low to moderate scale of magnitude (the likely case) and (2) the assessed impacts have a moderate to high scale of magnitude. If it is assessed that the environmental impacts are minimal, no IEE/EIA would be required. However, it needs to be ensured that the general ECOP for small-scale civil works and mitigation plan for fiber optic cable laying operation (Annex III and Annex IV) are included in the contractor's bidding documents so that it becomes obligatory for the contractor to adopt the EMP during execution of works. Having impacts with moderate to high scale is very much unlikely for CEDP; it is discussed nevertheless for the sake of completeness.

58. If screening suggests that the impacts are moderate to high (e.g. any land filling is required for sub-project site preparation such as filling of low lying lands, cutting of forest trees to clear land, construction activities in ecologically sensitive areas etc.) full Environmental Impact Assessment will be a condition for IDA financing. This will include detail examination of potential negative and positive environmental impacts, comparison of them with those of feasible alternatives, and recommendation for measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance. Typical safeguard actions to be taken during the EMF process are illustrated in the flowchart below:


Activities under the IDG of CEDP that may have probable impact on the environment
Small-scale civil works associated with new structures, renovation of existing structures, laboratory facilities
Installation of new fiber optic cable lines, connecting with existing fiber optic cable lines
For institutions receiving IDG, PIU identifies potential negative environmental impacts using impact screening form provided in **Annex I**
PIU identifies potential negative environmental impacts using impact screening form provided in **Annex II**
Activities screened as having low to moderate scale impacts, **no EIA or other safeguard instrument required,**
Activities are screened as having moderate to high impacts, **PIU performs EIA in line with the EMF** as per OP4.01 and DoE guidelines
Activities screened as having low to moderate scale impacts, **no EIA or other safeguard instrument required**
PIU uses the **ECOP for small civil works (Annex III)** in the EMF and includes them in the bidding and contract documents.
PIU prepares EMPs in line with EMF, including ECOP, and other required reports and/or monitoring program as needed; the EMPs will be submitted for WB clearance. Public consultation will be part of the EMP. Disclosure of EMPs are required
PIU uses the **Environmental Mitigation Measures for fiber optic cable installation (Annex IV)** in the EMF and includes them in the bidding and contract documents.
PIU, assisted by Environmental Consultants and/or subproject level focal person, monitors and supervises contractor performance and report the results periodically to MoE/DSHE and the WB in the project progress report; Information disclosure should be conducted periodically
WB will periodically review and monitor implementation of safeguards requirements (through implementation support mission and reports)

Environmental Impact Assessment (EIA)

59. Environmental Impact Assessment (EIA) will be only required for the activities having moderate to high impacts (as mentioned above), if Environmental Screening recommends. EIA will be used by the implementing agencies as a decision-making tool to ensure that the project design and implementation of activities are environmentally sound and sustainable. During the preparation phase, the objective of the EIA is to provide inputs to the feasibility study; preliminary and detailed design of the project including institutional capacity needs and barriers to be addressed. During the implementation phase, environmental management plans (developed as a part of the EIA during the preparation phase) serve as a framework for strengthening the mitigation, enhancement and environmental monitoring measures and system in the CEDP application. In the preparation phase, the EIA shall achieve the following objectives:

- To establish the environmental baseline in the study area, and to identify any significant environmental issue;
- To assess these impacts and provide for measures to address the adverse impacts by the provision of the requisite avoidance, mitigation and compensation measures;
- To integrate the environmental issues in the project planning and design;
- To develop appropriate management plans for implementing, monitoring and reporting of the environmental mitigation and enhancement measures suggested.

60. The EIA report should clearly spell out the site specific environmental issues and their mitigation measures. The Project Coordination Unit (PCU) will be responsible for preparing the ToR of the EIA, carrying out the EIA and the implementing agency (NU) should take prior approval of the DoE on these ToRs, if necessary. It may be mentioned that for IDG, the Principals of the colleges will be the procuring entity at the subproject level, they will procure the works and services through open tender.

Preparation of an Environmental Management Plan (EMP)

61. An EMP describes the basic principles and activities to be carried out to mitigate potential negative impacts. An EMP will briefly describe the subproject description; environmental and social background of the subproject area, including a good map showing locations of the subproject and site specific activities and/or process as appropriate; the potential impacts and proposed mitigation measures; and the implementation and monitoring arrangement and budget. Public consultation is also to be carried out as part of the EMP preparation. For each subproject, the EMP will clearly define actions to assess and mitigate associated risks as well as to mitigate potential impacts during site clearance and construction and to reduce the risks during operation. At a minimum, the EMP will include a standard ECOP (see Annex III) and site specific mitigation measures, including an environmental monitoring program. EMP provides an essential link between the impacts predicted and mitigation measures specified. EMP format needs to fit the circumstances in which EMP is being developed.

6. Review, Approval, Consultation and Disclosure

Review and approval of safeguards instruments

62. As per ECA 1995, the DoE has to review and approve all EIAs prepared for any project. As mentioned earlier, for small-scale construction projects (where no EIA is required), DoE does not customarily require any safeguard documents (e.g. the screening forms in this case) for review or approval even if the project may be categorized as Orange A or Orange B. In any case, CEDP will formally ask DoE before implementation of their subprojects if any environmental assessment documents would be required or any clearance needs to be obtained. If the DoE requires any environmental assessment report in this case, the CEDP PCU will prepare and submit the EA report as required for review and secure the approval of DoE before subproject appraisal. The procedure for obtaining clearance is stated in ECR 1997. Evidence of the approval will be provided to the World Bank for information.

63. The PCU shall consult with the World Bank environmental specialist on the implementation procedures as proposed in the EMF. These procedures, as described in the EMF, must cover: (a) screening of subprojects for their potential environmental impacts; (b) development of relevant safeguards instruments in accordance with World Bank policies and national laws; (c) implementation arrangements and institutional capacity needed to implement safeguards instruments; and (d) roles of Borrower and the World Bank for review and clearance of safeguards instruments.

Consultation and disclosure of safeguard instruments

64. The MoE/NU will share the EMF with concerned academic institutions, Department of Environment and civil society. As no potential affected one is identified at this stage, such field level consultation will be waived here. It will be disclosed in both Bangla and English by the MoE/NU in its CEDP website and it will also be made available at the World Bank's InfoShop. NU will also ensure that the EMF is available at the subproject level to its eligible institutions receiving IDG. Relevant subproject specific safeguard documents/mitigation plans (EMPs) prepared subsequently will also be disclosed to the public. If an EIA was prepared for any of the subprojects, the executive summary of the EIA needs to be disclosed in a similar manner as stated above.

7. EMF Implementation, Monitoring, and Reporting

Implementation Arrangement

65. The EMF will be implemented by the NU with specific functions at both the project and subproject levels. At the project level, the Project Coordination Unit (PCU) headed by the Project Director will take the lead in overseeing and monitoring of the implementation of subprojects and this unit will periodically supervise and monitor the safeguard implementation performance and include the progress/results in the Project Progress Report. For effective and timely implementation of environmental safeguard activities, one senior official will be designated by the NU as an environmental focal point who will be responsible for carrying out the activities as per the provisions of the EMF. In addition, NU will also assign two officials to assist the PD in EMF implementation. In order to assist the environmental focal person of the PCU in EMF implementation, an Environmental Management Consultant (EMC) will be hired by the project to assist the PCU in performing its tasks. The PCU will report on (a) compliance with measures agreed with the World Bank on the basis of the findings and results of the EA, including implementation of any EMP/ECOP,(b) the status of mitigation measures; and (c) the findings of monitoring programs.

66. The activities of the NU focal point will include: (1) coordinating the environmental screening activities in different institutions where physical interventions are being made, (2) assessing the nature of the impacts, (3) preparing IEE/EIA whenever necessary, (4) ensuring that the EMP is adequately reflected in the Contractor's bidding documents, (5) carry out monitoring activities at the subproject sites to assess the implementation of the EMP, (6) preparing reports of monitoring activities from time to time, (7) oversee the enhancement measures (if any) and tracking their progress.

67. At the subproject level, there will also be a local focal person at each of the institutions (typically a person appointed by the principal/head of the institutions) who will liaise with the focal point at NU. The local focal point will be trained and primarily responsible of filling out the screening forms and sending them to PCU for review. During project implementation, the focal person at the subproject level will be responsible for ensuring effective implementation of safeguard measures (EMPs/ECOP, etc.) in close consultation with local authorities and local communities. The monitoring activities carried out by the focal person at subproject level will be part of the subproject progress report.

68. The construction contractors are responsible for implementing mitigation measures and the mitigation costs will be part of the contract. The specific responsibilities of all the key persons in the implementation of EMF are summarized below in Table 1.

Table 1: Institutional responsibilities for the Project and Subproject Safeguard Implementation

Agencies/Units/ Individuals	**Responsibilities**
Project Implementing Agency (IA) and PCU	• The IA will be responsible for overseeing the project implementation including EMF implementation and environmental performance of the project. • PCU, representative of the IA, will be responsible for monitoring the overall project implementation, including environmental compliance of the project. PCU will have the final responsibility for EMF implementation and environmental performance of the project during both the construction and operational phases. • Specifically the PCU will: monitor and supervise implementation of ECOP and mitigation measures including incorporation of these into bidding and contractual documents; (iii) ensure that an environmental management system is set up and functions properly; (iv) be in charge of reporting on EMF implementation to the IA and the World Bank. • In order to be effective in the implementation process, PCU will have an environmental focal person with staff assigned specific responsibilities in EMF implementation. To assist in EMF implementation, an environmental management consultant will be appointed. PCU will determine the ToR of the environmental consultant.
Focal point at NU	The focal point will be responsible for: (i) screening subprojects for environmental impacts, policies triggered and instrument/s to be prepared;(ii) reviewing the subproject screening and assessment forms (EIA/EMPs in case of high environmental impact projects) to ensure quality of the documents; (iii) helping PCU to incorporate ECOP and EMP in civil works bidding and contractual documents; (v) reviewing monitoring reports submitted by subproject; (vi) conducting periodic site checks; (vii) advising the PCU on solutions to environmental issues of the project; and (viii) preparing environmental performance section on the progress and review reports to be submitted to the Implementing Agency and the World Bank.
Subproject level focal person	Responsible for implementation of the all the ECOP/EMP activities to be carried out under the subproject, including fostering effective coordination and cooperation between contractor, local authorities, and local communities during construction phase. S/he will liaise with the PCU focal point and share updates as necessary.
Contractor	• Based on the approved EMP and environmental specifications/requirements in the bidding and contractual documents, take actions to mitigate all potential negative impacts in line with the objective described in the ECOP/EMP. In addition, it is required that the Contractor get all permissions for construction (traffic control and diversion, excavation, labor safety, etc. before civil works) following current regulations. • Actively communicate with local residents and take actions to prevent disturbance during construction. • Ensure that all staff and workers understand the procedure and their tasks in the environmental management program. • Report to the PCU and subproject focal person on any difficulties and their solutions. • Report to local authority and subproject-level focal person if environmental accidents occur and coordinate with agencies and keys stakeholders to resolve these issues.

Monitoring and Reporting

69. Timing, frequency and duration of monitoring protocols should be linked to the overall implementation schedule of the project and will be decided by the Project Director. However the timing, frequency and duration of these protocols should be at such intervals which would allow sufficient information to be conveyed regarding the smooth progress of implementation of the EMP/ECOP.

70. Reporting on the EMF implementation will not be done separately. The safeguard performance will be included in subproject and project progress reports. At the project level, the PCU will prepare a safeguard performance report twice per year to be included in the progress report describing the project compliance with the EMF and other safeguard requirements including the results of new subproject screening and safeguards documentation.

71. Project Director of PCU will share half yearly progress report on EMF implementation with the World Bank. The report will contain the initial screening report of all subproject proposals, identified environmental concerns, appropriate mitigation measures and monitoring plan. It will also present the monitoring and management status of the EMP implementation of the ongoing activities in the selected subprojects/institutions as well as progress regarding the implementation of enhancement measures.

72. Implementation of mitigation measures mentioned in the EMP may involve an initial investment cost as well as recurrent costs. The EMP should include costs estimates for each measure, which will be part of the sub-project cost.

73. A sample monitoring report format is provided in Annex V. The PCU may decide to adopt a similar format or make alterations to it depending on the nature and mechanism of subproject and its monitoring protocol.

Environmental Enhancement

74. Where IDG will be used to upgrade laboratory facilities or establishing new laboratories in eligible institutions, a synchronized standard laboratory operating procedures will be developed for operating these laboratories. Safety guidelines relevant to specific types of laboratories will be developed. An outline of generic safety protocols for laboratories is provided in Annex VI. The status of laboratory safety protocol initiation will be reported along with the monitoring reports.

Annex I: Environmental Screening Checklist for Civil Works related to CEDP

(new construction, renovation/refurbishment works)

Instructions:

The purpose of this checklist is to identify potential environment and safety issues related to new infrastructure development, renovation/refurbishing work related to the CEDP. The relevant Engineer of respective work will fill-up the format, which is expected to be reviewed and signed by an Environmental Professional. However, the checklist must be reviewed and signed by the respective Subproject Manager/ Head of the Institution. If the checklist shows potential negative environmental impacts, the institution will submit a separate sheet for mitigation measures for it following the Environmental Codes of Practice (Annex III).

Title of Sub-project:_____

Name of the Institution:_____

Types of Civil Work (new structure/ renovation/ refurbishment of existing structure):

_____

Estimated cost of Civil Work: _____

Duration of Civil work: _____

Tentative Start Date: _____

Name and Designation of the Sub-project Coordinator/Focal Point:

_____

Brief Description of Small infrastructure renovation/ refurbishing work (Within 200 words, attach separate sheet if necessary)

Checklist

Sl	Screening Questions	Yes	No	Not Aware	Possible Negative Impact and assessment (low/moderate/high)[3]
1	Will the construction activities generate a significant amount of construction solid waste?				
2	Will fuel and/or hazardous goods be used in construction activities?				
3	Will fuel and/or hazardous substances be stored at the construction site?				
4	Is there a possibility of discharging liquid effluent from the construction site?				
5	Will construction materials be stockpiled near surface waters, public drains and natural water courses?				
6	Will construction activities affect the natural drainage pattern of the site (e.g. filling up low-lying land)?				
7	Is earthwork (earth excavation, backfilling, stockpiling of excavated soil) involved in construction activities?				
8	Is there a possibility of water stagnation at the construction site?				
9	Will the topsoil and vegetation be cleared as a result of the construction?				*Please mention how many trees will be cut*
10	Is there a possibility of fragmentation of natural floral or faunal habitats?				
11	Is significant movement of vehicles involved during construction activities?				
12	Will dust and vibration-generating equipment be used?				*mention what kind of equipment be used*
13	Will construction activities be carried out near religious and cultural sites?				
14	Will child and pregnant women be used in construction activities?				
15	Is there a safe source of drinking water and adequate sanitation facilities available for the workers at or near the construction site?				*mention the location of the facilities*
16	Will the workers be provided protective equipment, devices and clothing and be ensured those are used?				
17	Will enough health and safety direction and insurance				

[3] If the answer of the questionnaire is 'Yes', please describe the possible negative environmental impact.

Sl	Screening Questions	Yes	No	Not Aware	Possible Negative Impact and assessment (low/moderate/high)[3]
	be provided to the workers?				
18	Is there a risk to safety and human health to people other than workers?				
19	Is the construction being carried out in an ecologically sensitive area?				

Signature:
The above answers are true and complete. I understand that the DSHE is relying on them to make its decision.

Sub-project Focal Point/ Head of the Institution Signature& Date:

_____

Name of the Sub-project Focal Point/ Head of the Institution:

_____

Contact Number and E-mail of Sub-project Focal Point/ Head of the Institution:

_____

Please sign below to verify that the information in this document is accurate and complete to the best of your knowledge.

Environmental Focal Point of PCU Signature& Date:

_____

Name of the Environmental Focal Point of PCU:

_____

Contact Number and E-mail of the Environmental Focal Point of PCU:

_____

Annex II: Environmental Screening Checklist for Fiber Optic cable installation-related works for CEDP

(new cable installation, connection to existing cable lines)

Instructions:

The purpose of this checklist is to identify potential environment and safety issues related to fiber optic cable laying work related to the CEDP. The relevant Engineer of respective work will fill-up the checklist, which is expected to be reviewed and signed by an Environmental Professional. However, the checklist must be reviewed and signed by the respective Subproject Manager/ Head of the Institution. If the checklist shows potential negative environmental impacts, the institution will submit a separate sheet for mitigation measures for it following the mitigation measures (Annex IV).

1. Title of Sub-project:_____

2. Name of the Institution receiving optic fiber connection:_____

(a) Total Length (km) :
(b) Type of Line : □ Underground □ Overhead
(c) Start/ End Point :
(d) Control Station Location :

3. Layout of proposed Fiber optic Line :(attach layout map)

4. Land ownership and permissions:

Names of the govt. agencies owning the land:
Area of land to be used (acre) :
(attach a copy of the agency's permission to use their land)

5. Brief information of surrounding environment along fiber optic line influence area

Characteristics of route of optical fiber line:

….. % paddy/crop field; ….. % along road/highway; ….. % village/human settlement;

….. % industrial area; ….. % forest; ….. % wetland/river; ….. % other (specify)

Brief Information on human settlement, industrial/commercial establishments, water body, flora, fauna, historical or culturally important sites, ecologically sensitive areas, traffic: (attach separate sheet if necessary)

6. Estimated cost of sub-project :(Mil BDT)

7. Schedule of implementation

Sub-project duration (months) :
Tentative start date :

Tentative completion date :

Name and Designation of the Sub-project Coordinator/Focal Point:

_____

Checklist

Sl	Screening Questions	Yes	No	Not Aware	Possible Negative Impact and assessment (low/moderate/ high)[4]
1	Air Pollution due to fugitive construction dust, fossil fuel burning by construction equipment, increased traffic				
2	Damage/ reduction of native flora, displacement of wildlife, birds etc.				
3	Water pollution by suspended solids as a result of soil erosion or by accidental fuel spills				
4	Noise pollution (e.g. due to HDD operation)				
5	Disruption of local drainage				
6	Traffic congestion during roadside work				
7	Direct or indirect impact to natural, manmade or buried physical cultural resources				
8	Health and safety of workers, risk to pedestrian movement				
9	Obstruction or interference with other utility infrastructures				
10	Visual impact of construction work in the locality, inconvenience in performing economic activities of local vendors and shopkeepers.				
11	Loss of business /income or employment due to temporary displacement or temporary removal of structures				
12	Worker hazard related to fiber optic cable handling (exposure to laser, microscopic fiber optic shards), fire hazard				
13	Water pollution due to sediment suspension (increase in suspended solids) or washing away of slurry to the water bodies				

[4] If the answer of the questionnaire is 'Yes', please describe the possible negative environmental impact.

Signature:
The above answers are true and complete. I understand that the MoE/DSHE is relying on them to make its decision.

Sub-project Focal Point/ Head of the Institution Signature and Date:

_____

Name of the Sub-project Focal Point/ Head of the Institution:

_____

Contact Number and E-mail of Sub-project Focal Point/ Head of the Institution:

_____

Please sign below to verify that the information in this document is accurate and complete to the best of your knowledge.

Environmental Focal Point of PCU Signature & Date:

_____

Name of the Environmental Focal Point of PCU:

_____

Contact Number and E-mail of the Environmental Focal Point of PCU:

_____

Annex III: General Environmental Codes of Practice for Small-scale Civil Works

The Environmental Codes of Practice (ECOP) is prepared to manage small environmental impacts during construction. The ECOPs will apply to manage small scale infrastructure investments subproject. ECOP will be a mandatory part of construction contract or bidding documents so that contractor complies with environmental covenants. PCU and construction supervisors will be responsible for monitoring of compliance with ECOP and preparing the required reports.

Responsibilities

The subproject owner (PCU) and Contractors are the key entities responsible for implementation of this ECOP. Key responsibilities of PCU and the contractors are as follows:

(a) PCU

PCU is responsible for ensuring that the ECOP is effectively implemented. The PCU will assign a qualified staff to be responsible for checking implementation compliance of Contractors, include the following: (a) monitoring the contractors' compliance with the environmental plan, (b) taking remedial actions in the event of non-compliance and/or adverse impacts, (c) investigating complaints, evaluating and identifying corrective measures; (d) advising the Contractor on environment improvement, awareness, proactive pollution prevention measures; (e) monitoring the activities of Contractors on replying to complaints; (f) providing guidance and on-the-job training to field engineers on various aspects to avoid/mitigate potential negative impacts to local environment and communities during construction.

(b) Contractor

Contractor is responsible for carrying out civil works and informs PCU, local authority and community about construction plan and risks associated with civil works. As such, contractor is responsible for implementing agreed measures to mitigate environmental risks associated with its civil works.

Contractor is required to obey other national relevant legal regulations and laws.

ECOP 1: Waste Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
General Waste	Soil and water pollution from the improper management of wastes and excess materials from the construction sites.	The Contractor shall - Organize disposal of all wastes generated during construction in the designated disposal sites approved by the Project authority. - Minimize the production of waste materials by 3R (Reduce, Recycle and Reuse) approach. - Segregate all wastes, wherever practical. - Vehicles transporting solid waste shall be totally confined within an enclosed vehicle or is fully covered with a tarp to prevent spilling waste along the route. - Tarp must be undamaged (not torn or frayed) properly secured to the body of the vehicle or trailer with ropes, chains, straps, or cords so that no waste is exposed. The edges of the tarps shall extend 12 inches over the permanent sides and back of the open top vehicle or trailer and must be secured to the permanent vehicle. All loads must be tarped from the point of origin of the waste to the tipping area of the final disposal/landfill. - Train and instruct all personnel in waste management practices and procedures as a component of the environmental induction process. - Provide refuse containers at each worksite. - Request suppliers to minimize packaging where practicable. - Place a high emphasis on good housekeeping practices. - Maintain all construction sites clean, tidy and safe and provide and maintain appropriate facilities as temporary storage of all wastes before transporting to final disposal.

ECOP 2: Fuels and Hazardous Goods Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Fuels and hazardous	Materials used in	The Contractor shall

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
goods.	construction have a potential to be a source of contamination. Improper storage and handling of fuels, lubricants, chemicals, hazardous goods/materials on-site, wash down of plant and equipment, and potential spills may harm the environment or health of construction workers.	- Train the relevant construction personnel in handling of fuels and spill control procedures. - Refueling shall occur only within bunded areas. - Store dangerous goods in bunded areas on top of a sealed plastic sheet away from watercourses. Store all liquid fuels in fully bunded storage containers, with appropriate volumes, a roof, a collection point and appropriate filling/decanting point. - Store and use fuels in accordance with material safety data sheets (MSDS). Make available MSDS for chemicals and dangerous goods on-site. - Store hazardous materials at above flood level, determined for construction. - Make sure all containers, drums, and tanks that are used for storage are in good condition and are labeled with expiry date. Any container, drum, or tank that is dented, cracked, or rusted might eventually leak. Check for leakage regularly to identify potential problems before they occur. - Sit containers and drums in temporary storages in clearly marked areas, where they will not be run-over by vehicles or heavy machinery. The area shall preferably drain to a safe collection area in the event of a spill. - Take all precautionary measures when handling and storing fuels and lubricants, avoiding environmental pollution. - All machinery is to be stored and away from any water body, drainage inlets or natural drainage area, where practical. - Oil and chemical spills and washouts shall be cleaned up and collected immediately. Materials shall be transported by an approved / licensed transporter. Contaminated Material to be removed from site as soon as reasonably practical after the incident. - Provide appropriate personal protective equipment (protective clothing, safety boots, helmets, masks, gloves, goggles, etc.) to the construction personnel, depending on the materials handled. - Avoid the use of material with greater potential for contamination by substituting

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		them with more environmentally friendly materials.

ECOP 3: Water Resources Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Hazardous material and Waste	Water pollution from the storage, handling and disposal of hazardous materials and general construction waste, and accidental spillage	The Contractor shall - Follow the management guidelines proposed in ECOP 1: Waste Management and ECOP 2: Fuels and Hazardous Goods Management. - Minimize the generation of spoils, oil and grease, excess nutrients, organic matter, litter, debris and any form of waste (particularly petroleum and chemical wastes). These substances must not enter waterways or storm water systems.
Discharge from construction sites	Construction activities, sewerages from construction sites and work camps may affect the surface water quality. The construction works will modify groundcover and topography, changing the surface water drainage patterns of the area. These changes in hydrological regime lead to increased rate of runoff, increase in sediment and contaminant loading, increased flooding, and effect habitat of fish and other aquatic biology.	The Contractor shall - Install temporary drainage works (channels and check dams) in areas required for sediment and erosion control and around storage areas for construction materials. - Install temporary sediment lagoons, where appropriate, to capture sediment-laden run-off from work site. - Stockpile materials away from drainage lines. - Prevent all solid and liquid wastes entering waterways by collecting spoils, oils, chemicals, bitumen spray waste and wastewaters from brick, concrete and asphalt cutting where possible and transport to an approved waste disposal site or recycling depot. - Wash out ready-mix concrete agitators and concrete handling equipment at washing facilities off site or into approved bunded areas on site. Ensure that tires of construction vehicles are cleaned in the washing bay (constructed at the entrance of the construction site) to remove the mud from the wheels. This should be done in every exit of each construction vehicle to ensure the local roads are kept clean.
Soil erosion and siltation	Soil erosion and dust from the material stockpiles will increase	The Contractor shall - Stabilize the cleared areas not used for construction activities with vegetation or

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
	the sediment and contaminant loading of surface water bodies.	appropriate surface water treatments as soon as practicable following earthwork to minimize erosion. - Ensure that roads used by construction vehicles are swept regularly to remove dust and sediment. - Water the loose material stockpiles, access roads and bare soils on an as needed basis to minimize dust. Increase the watering frequency during periods of high risk (e.g. high winds).
Drinking water	Untreated surface water is not suitable for drinking purposes due to presence of suspended solids and E.coli.	The Contractor Shall Provide drinking water that meets National and WHO Drinking Water standards.

ECOP 4: Drainage Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Excavation and earth works, and construction yards	Lack of proper drainage for rainwater/liquid waste or wastewater owing to the construction activities harms environment in terms of water and soil contamination, and mosquito growth.	The Contractor shall - Provide alternative drainage for rainwater if the construction works/earth-fillings cut the established drainage line. - Establish local drainage line with appropriate silt collector and silt screen for rainwater or wastewater connecting to the existing established drainage lines already there. - Rehabilitate road drainage structures immediately if damaged by contractors' road transports. - Build new drainage lines as appropriate and required for wastewater from construction yards connecting to the available nearby recipient water bodies. - Ensure that there will be no water stagnation at the construction sites and camps. - Protect natural slopes of drainage channels to ensure adequate storm water drains. - Regularly inspect and maintain all drainage channels to assess and alleviate any drainage

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		congestion problem.
Ponding of water	Health hazards due to mosquito breeding	- Do not allow ponding of water especially near the waste storage areas and construction camps. - Discard all the storage containers that are capable of storing of water, after use or store them in inverted position.

ECOP5: Erosion and Sediment Control

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Clearing of construction sites	Cleared areas and slopes are susceptible for erosion of top soils, which affects the growth of vegetation and causes ecological imbalance.	The Contractor shall - Reinstate and protect cleared areas as soon as possible. - Cover unused area of disturbed or exposed surfaces immediately with mulch/grass turf/tree plantations.
Construction activities and material stockpiles	The impact of soil erosion are (i) Increased run off and sedimentation causing a greater flood hazard to the downstream and silt accumulation and (ii) destruction of aquatic environment by erosion and/or deposition of sediment damaging the spawning grounds of fish	The Contractor shall - Locate stockpiles away from drainage lines. - Protect the toe of all stockpiles, where erosion is likely to occur, with silt fences, straw bales or bunds. - Remove debris from drainage paths and sediment control structures. - Cover the loose sediments of construction material and water them if required. - Divert natural runoff around construction areas prior to any site disturbance. - Install protective measures on site prior to construction, for example, sediment traps. - Install ‘cut off drains’ on large cut/fill batter slopes to control water runoff speed and hence erosion. - Observe the performance of drainage structures and erosion controls during rain and modify as required.

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Soil erosion and siltation	Soil erosion and dust from the material stockpiles will increase the sediment and contaminant loading of surface water bodies.	The Contractor shall - Stabilize the cleared areas not used for construction activities with vegetation or appropriate surface water treatments as soon as practicable following earthwork to minimize erosion. - Ensure that roads used by construction vehicles are swept regularly to remove sediment. - Water the material stockpiles, access roads and bare soils on an as required basis to minimize dust. Increase the watering frequency during periods of high risk (e.g. high winds).

ECOP6: Air Quality Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction vehicular traffic	Air quality can be adversely affected by vehicle exhaust emissions and combustion of fuels.	The Contractor shall - Fit vehicles with appropriate exhaust systems and emission control devices. Maintain these devices in good working condition. - Operate the vehicles in a fuel efficient manner. - Cover hauling vehicles carrying dusty materials moving outside the construction site. - Impose speed limits on all vehicle movement at the worksite to reduce dust emissions. - Control the movement of construction traffic. - Water construction materials prior to loading and transport. - Service all vehicles regularly to minimize emissions. - Limit the idling time of vehicles not more than 2 minutes.
Construction machinery	Air quality can be adversely affected by emissions from machinery and combustion of fuels.	The Contractor shall - Fit machinery with appropriate exhaust systems and emission control devices. Maintain these devices in good working condition in accordance with the specifications defined by their manufacturers to maximize combustion efficiency and minimize the contaminant emissions.

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		- Pay special attention to control emissions from fuel generators. - Machinery causing excessive pollution (e.g., visible smoke) will be banned from construction sites. - Service all equipment regularly to minimize emissions. - Provide filtering systems, dust collectors or humidification or other techniques (as applicable) to the concrete batching and mixing plant to control the particle emissions in all stages, including unloading, collection, aggregate handling, cement application, circulation of trucks and machinery inside the installations.
Construction activities	Dust generation from construction sites, material stockpiles and access roads is a nuisance in the environment and can be a health hazard, and also can affect the local crops	The Contractor shall - Water the material stockpiles, access roads and bare soils on an as needed basis to minimize the potential for environmental nuisance due to dust. Increase the watering frequency during periods of high risk (e.g. high winds). Stored materials such as gravel and sand shall be covered and confined to avoid their being wind-drifted. - Minimize the extent and period of exposure of the bare surfaces. - Restore disturbed areas as soon as practicable by vegetation/grass-turfing. - Establish adequate locations for storage, mixing and loading of construction materials, in a way that dust generation is minimized during such operations. - Crushing of rock and aggregate materials shall be wet-crushed, or performed with particle emission control systems. - Not permit the burning of solid waste.

ECOP7: Noise and Vibration Management

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction vehicular traffic	Noise quality will be deteriorated due to vehicular traffic	The Contractor shall - Maintain all vehicles in order to keep it in good working condition in accordance with manufactures maintenance procedures.

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		- Make sure all drivers will comply with the traffic codes concerning maximum speed limit, driving hours, etc. - Perform the loading and unloading of trucks, and handling operations minimizing construction noise on the work site.
Construction machinery	Noise and vibration may have an impact on people, property, fauna, livestock and the natural environment.	The Contractor shall - Appropriately organize all noise generating activities to avoid noise pollution to local residents. - Use the quietest available plant and equipment in construction work. - Maintain all equipment in order to keep them in good working order in accordance with manufactures maintenance procedures. Equipment suppliers and contractors shall present proof of maintenance register of their equipment. - Install acoustic enclosures around generators to reduce noise levels. - Fit high efficiency mufflers to appropriate construction equipment. - Avoid unnecessary use of alarms, horns and sirens.
Construction activity	Noise and vibration may have an impact on people, property, fauna, livestock and the natural environment.	The Contractor shall - Notify adjacent landholders prior to typical noise events outside of daylight hours. - Employ best available work practices on-site to minimize occupational noise levels. - Install temporary noise control barriers where appropriate. - Notify affected people if major noisy activities will be undertaken, e.g. blasting. - Plan activities on site and deliveries to and from site to minimize impact. - Monitor and analyze noise and vibration results and adjust construction practices as required. - Avoid undertaking the noisiest activities, where possible, when working at night near the residential areas.

ECOP8: Protection of Flora

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Vegetation clearance	Local flora is important habitats for birds, provide fruit harvest, timber/fire wood, protect soil from erosion and overall keep the natural balance for human-living. As such damage to flora has wide range of adverse environmental impacts.	The Contractor shall - Minimize disturbance to surrounding vegetation. - Get approval from supervision consultant for clearance of vegetation. - Make selective and careful pruning of trees where possible to reduce need of tree removal. - Control noxious weeds by disposing of at designated dump site or burn on site. - Clear only the vegetation that needs to be cleared in accordance with the engineering plans and designs. These measures are applicable to both the construction areas as well as to any associated activities such as sites for stockpiles, disposal of fill, etc. - Minimize the length of time the ground is exposed or excavation left open by clearing and re-vegetate the area at the earliest practically possible. - Ensure excavation works occur progressively and re-vegetation done at the earliest. - Provide adequate knowledge to the workers regarding nature protection and the need of avoid felling trees during construction

ECOP9: Protection of Fauna

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction activities	The location of construction activities can result in the loss of wild life habitat and habitat quality,	The Contractor shall - Limit the construction works within the designated sites allocated to the contractors. - Check the site (especially trenches) for trapped animals, and rescue them by the help of a qualified person. - Provide temporary access to the animals to cross the trenches.
Vegetation clearance	Clearance of vegetation may impact shelter, feeding and/or breeding and/or physical destruction and severing of	The Contractor shall - Restrict the tree removal to the minimum numbers required. - Fell the hollow bearing trees in a manner which reduces the potential for fauna mortality. After felling, hollow bearing trees will remain unmoved

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
	habitat areas	overnight to allow animals to move of their own volition. Care should be taken to make sure bird habitats are not destroyed. If there is no option available, rehabilitate them in other neighboring trees. Also protect and rehabilitate injured or orphaned birds.

ECOP 10: Cultural and Religious Issues

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Construction activities near religious and cultural sites	Disturbance from construction works to the cultural and religious sites, and contractors lack of knowledge on cultural issues cause social disturbances.	The Contractor shall - Communicate to the public through community consultation regarding the scope and schedule of construction, as well as certain construction activities causing disruptions or access restriction. - Not block access to cultural and religious sites, wherever possible. - Stop construction works that produce noise (particularly during prayer time) should there be any church/mosque/religious/educational institutions and health center close to the construction sites and users make objections. - Take special care and use appropriate equipment when working next to a cultural/religious center. - Stop work immediately and notify the site manager, if during construction, an archaeological or burial site is discovered. It is an offence to recommence work in the vicinity of the site until 'approval to continue' is obtained by the archaeological authority. - Provide independent prayer facilities to the construction workers. - Allow the workers to participate in praying during construction time, if there is a request. - Resolve cultural issues in consultation with local leaders and supervision consultants.

ECOP 11: Worker Health and Safety

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Best practices	Construction works may pose health and safety risks to the construction workers and site visitors leading to severe	The Contractor shall - Implement suitable safety standards for all workers and site visitors, with sufficient provisions to comply with international standards (e.g. International Labor Office guideline on 'Safety and Health in

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
	injuries and deaths. The population in the proximity of the construction site and the construction workers will be exposed to a number of (i) biophysical health risk factors, (e.g., noise, dust, chemicals, construction material, solid waste, waste water, vector transmitted diseases, etc.), (ii) risk factors resulting from human behavior (e.g., STD, HIV/AIDS, etc.) and (iii) road accidents from construction traffic.	Construction; World Bank Group's 'Environmental Health and Safety Guidelines') and contractor's own safety standards, in addition to complying with national standards. - Adopt the specific provisions of worker health and safety as per Bangladesh labour Law are provided in Annex VII. - Provide the workers with a safe and healthy work environment, taking into account inherent risks in its particular construction activity and specific classes of hazards in the work areas. - Provide personal protective equipment (PPE) for workers, such as safety boots, helmets, masks, gloves, protective clothing, goggles, full-face eye shields, and ear protection. Maintain the PPE properly by cleaning dirty ones and replacing the damaged ones. - Safety procedures include provision of information, training and protective clothing to workers involved in hazardous operations and proper performance of their job.
	Child and pregnant labor	The Contractor shall not hire children of less than 14 years of age and pregnant women or women who delivered a child within 8 preceding weeks.
Accidents	Lack of first aid facilities and health care facilities in the immediate vicinity will aggravate the health conditions of the victims	The Contractor shall - Ensure health care facilities and first aid facilities are readily available. Appropriately equipped first-aid stations should be easily accessible throughout the place of work. - Document and report occupational accidents, diseases, and incidents. - Prevent accidents, injury, and disease arising from, associated with, or occurring in the course of work by minimizing, so far as reasonably practicable, the causes of hazards, in a manner consistent with good international industry practice. - Identify potential hazards to workers, particularly those that may be life-

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		threatening and provide necessary preventive and protective measures. - Provide awareness to the construction drivers to strictly follow the driving rules. - Provide adequate lighting in the construction area
Water and sanitation facilities at the construction sites	Lack of Water sanitation facilities at construction sites cause inconvenience to the construction workers and affect their personal hygiene.	The contractor shall - Provide safe drinking water facilities to the construction workers at all the construction sites. - Provide appropriate sanitation facilities for the workers

ECOP 12: Encountering Buried Physical Cultural Resources (PCR)

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
Earthwork Activities	Contractor discovers archeological sites, historical sites, remains and objects, including graveyards and/or individual graves during excavation or construction	the Contractor shall: - Stop the construction activities in the area of the chance find; - Delineate the discovered site or area; - Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities or the Department of Culture and Information takes over; - Notify the Focal person at the subproject level who will inform the PCU which in turn will notify the Department of Archaeology (within 24 hours or less); - the Department of Archaeology would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would

Project Activity/ Impact Source	Environmental Impacts	Mitigation Measures/ Management Guidelines
		require a preliminary evaluation of the findings to be performed. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; those include the aesthetic, historic, scientific or research, social and economic values; - Decisions on how to handle the finding shall be taken by the responsible authorities. This could include changes in the layout (such as when finding an irremovable remain of cultural or archeological importance) conservation, preservation, restoration and salvage; - If the cultural sites and/or relics are of high value and site preservation is recommended by the professionals and required by the cultural relics authority, the Project's Owner will need to make necessary design changes to accommodate the request and preserve the site; - Decisions concerning the management of the finding shall be communicated in writing by relevant authorities and Construction works could resume only after permission is granted from the responsible local authorities concerning safeguard of the heritage.

Annex IV: General Impacts and Respective Mitigation Measures for Activities Associated with the Installation of Fiber Optic Cables under the CEDP

Activity/Issues	Potential Impacts	Proposed Mitigation and Enhancement Measures
Excavation and backfilling (trenching operation), concreting work, mobilization of vehicles and equipment	Air Pollution due to fugitive construction dust, fossil fuel burning by construction equipment, increased traffic	• Ensure that all project vehicles are in good operating condition • Spray water on dry surfaces/ unpaved roads/ vulnerable areas regularly to reduce dust generation • Maintain adequate moisture content of soil during transportation, compaction and handling • Sprinkle and cover stockpiles of loose materials (e.g., fine aggregates for concreting work). • Securing and covering material in open trucks while hauling excavated material, construction materials (for concreting work) • For concreting work, not using equipment such as stone crushers at site, which produce significant amount of particulate matter • Establishment of minimally intrusive and well-designed traffic patterns for onsite construction activities • Limiting GHG emission by using modern construction equipment and by prohibiting excessive idling of equipment when not in use.
	Damage/ reduction of native flora, displacement of wildlife, birds etc.	• Plantation/afforestation program for tree replacement (plantation of at least two trees of similar species for each cut tree). • Provide proper compensation if there is any destruction of trees outside RoW. • Not removing undergrowth fully where possible, so that they may re-grow naturally after the project activity. • Control intensive movement of heavy construction vehicles. • Temporary stockpiling of materials should be done on non-vegetative surfaces • Avoid removing mature riparian vegetation. • Re-vegetation should be done using native, non-invasive species and by

Activity/Issues	Potential Impacts	Proposed Mitigation and Enhancement Measures
		preventing the introduction of noxious weeds • Keep noise level (e.g., from equipment) to a minimum level, as certain fauna may be very sensitive to loud noise.
	Water pollution by suspended solids as a result of soil erosion or by accidental fuel spills	• Remove from site excess subsoil, substrate, and/or large rock materials that cannot be buried in the excavated trench • Install sediment basins to trap sediments in storm water prior to discharge to surface water. • Replant vegetation when soils have been exposed or disturbed. • No in-stream river or water body crossing will be allowed • Work would be halted when wet conditions would lead to excessive damage to soils and vegetation in work areas. • Hazardous materials (fuel) will not be drained into the ground or allowed to drain into the nearest drainage canals. • A spill prevention, containment, and countermeasure plan would be prepared. This plan would detail the measures required of all construction, operation, and maintenance personnel for transport, storage, use, spill response/ containment, and disposal of hazardous materials, waste, and debris.
	Noise pollution	• Use of noise suppressors and mufflers in heavy construction equipment. • Avoid using of construction equipment producing excessive noise during school hours and also at night • Avoid prolonged exposure to noise (produced by equipment) by workers/ give protective gears • Regulate use of horns and avoiding use of hydraulic horns in project vehicles.

Activity/Issues	Potential Impacts	Proposed Mitigation and Enhancement Measures
	Disruption of local drainage	• Provide adequate diversion channel, if required • Provide facilities for pumping of congested water, if needed • Ensure adequate monitoring of drainage effects, especially if construction works are carried out during the wet season.
	Traffic congestion during roadside work	• Schedule deliveries of material/ equipment during non-school hours and after regular working hours • Employ a minimally intrusive and well-designed traffic patterns for onsite activities • Depute flagman for traffic control • Arrange for signal light at night
	Direct or indirect impact to natural, manmade or buried physical cultural resources	• Excavation activities through places of archaeological and historical importance should be avoided at all costs. • Place fences at the boundaries of these places so that construction activities or equipment movement do not harmfully affect them. • Limiting noise-generating activities near such sites, which can interfere with the use and enjoyment of PCR such as tourist destinations, historic buildings, religious establishments and cemeteries? • During excavation activities, if any buried PCR items are found, the Chance Find Procedures outlined in Annex III (ECOP 12) will be adopted.
	Health and safety of workers, risk to pedestrian movement	• Clean bill of health a condition for employment • Provide the workers with personal protective equipments for protection against dust and noise • Contractors and workers should wear high visibility safety apparel while working in public right of way. • Signposts and directional signs should be provided at appropriate locations for pedestrians and traffic at construction site. • Contractor should develop an occupational health and safety plan

Activity/Issues	Potential Impacts	Proposed Mitigation and Enhancement Measures
	Obstruction or interference with other utility infrastructures	During design and permitting process of the project, efforts should be made to coordinate and minimize disruptions
Installation of fiber optic cables	Various injuries related to fiber optic cable handling (exposure to laser, microscopic fiber optic shards), fire hazard	• Follow the fiber optic cable safety protocols as stated in IFC guidelines for environmental, health and safety for telecommunications (Appendix VIII)
Horizontal Directional Drilling Work	Noise and air pollution, worker health and safety, disruption of local drainage	• As applicable, adopt similar noise and air pollution mitigation measures, measures to prevent drainage congestion and ensuring worker health and safety stated above for trenching operation, concreting work, mobilization of vehicles and equipment.
	Water pollution due to sediment suspension (increase in suspended solids) or washing away of slurry to the water bodies	• The directional drilling equipment should be placed away from stream shore (at least 20 feet away from stream shore) • Ensuring that no seepage occurs through the borehole. • After completion of the borehole, all slurry should be removed from the construction site and disposed in an approved site.
General	Health and safety of workers	• Provide the workers with personal protective equipment for protection against noise. • Contractors should comply with the relevant IFC guidelines of occupational health and safety as well as safety provisions in the national labour law (see Appendix VII)

Annex V: A Sample for Environmental Monitoring Protocol for CEDP

(Small-scale civil works and Fiber Optic Cable laying)

Instructions:

The purpose of this protocol is to guide the PIU on the monitoring and reporting of environmental mitigation actions taken in various subprojects for effective EMF implementation. The environmental issues that were identified during subproject screening (checklists in Annex I and II) will be associated with one or more mitigation measures that need to be adopted by the Contractor. The effectiveness of the mitigation measures adopted by the Contractor has to be monitored and reported. The following format for monitoring reporting can serve as a guideline only. The PIU may decide to modify the protocol as and when necessary.

Activities Associated with low to moderate environmental impacts	Suggested mitigation measures/ ECOP	Mitigation Measures Adopted by the Contractor	Monitoring of mitigation measures	Frequency of monitoring during period of activities	Name of the person conducting the monitoring
(From screening checklists in Annex I and II)	(From Annex III and IV)	(Mention which mitigation measure the contractor has adopted)	(Describe the method of monitoring)	(Once/week, once/month etc. depending on the activities)	(Typically will be performed by the focal person at the subproject level)
Example: Dust generated from stored stockpiles of construction materials can deteriorate air quality	The Contractor shall Water the material stockpiles, access roads and bare soils on an as needed basis to minimize the potential for environmental nuisance due to dust. Stored materials such as gravel and sand shall be covered and confined to avoid their being wind-drifted. Establish adequate locations for storage, mixing and loading of construction materials, in a way that dust generation is minimized during such operations.	Contractor has taken measures to Water the stockpiles in a daily basis, cover stored materials when not in use	Visual observation (snapshot of the appropriately stored stockpiles are attached in the Annex)	Once/week	Mr. X

Annex VI: A Sample Outline of Laboratory Standard Operating Procedures (SOP)

A Standard Operating Procedure (SOP) is a written set of instructions that document how to safely perform work involving hazardous materials or hazardous operations. Factsheets of certain chemicals (e.g. Hydrofluoric Acid) may serve as SOPs for those chemicals. These factsheets may come with the chemical supplier or may be obtained from the manufacturer's website. For common laboratory equipment, the manufacturer's operations and maintenance manual may serve as, or supplement, the SOP.

SOPs may focus on any of the following:

- Process (e.g., peptide synthesis, distillation)
- Hazardous chemical (e.g., carbon monoxide, perchloric acid)
- Class of hazardous chemical (e.g., organic solvents)

When writing an SOP, the following sections may be included:

Section 1 — Process

List the process or type of process involving hazardous chemicals - for example, "atomic absorption spectroscopy for heavy metals." Include any unique equipment used. If the term "process" does not apply, proceed to Section 2.

Section 2 —Hazardous Chemicals Involved

List the hazardous chemicals (or class of chemicals) involved, including any hazardous products or by-products. Material Safety Data Sheets (MSDSs) for highly reactive or unstable chemicals should be on hand; MSDSs for all chemicals should be readily accessible. MSDSs for most chemicals are available through the chemical manufacturer. The information will include chemical structure and properties (flammability, corrosiveness, toxicity, reactivity and poisonous). In special cases, carcinogenic, mutagenic and teratogenic, radioactive and asbestos containing materials and compressed gases, additional information regarding the health hazard and date, detail information should be labeled on the container.

Section 3—Potential Hazards

Describe the potential dangers for each hazardous chemical or each element of the hazardous process or procedure. Include physical, health, and environmental hazards. To find hazard information, look up the MSDSs (available from the EH&S web site or from chemical manufacturers) database that provides hazard information in a user-friendly format. In addition, the Sigma- Aldrich or other renowned supplier/manufacturer's web site, has technical bulletins that provide detailed information about various processes, equipment and classes of chemicals.

Section 4—Approvals Required

List the circumstances under which a particular laboratory operation, procedure, or activity requires prior approval from the laboratory supervisor, or other personnel.

Section 5—Designated Area
Consider establishing a designated area for this operation within the laboratory. A fume hood, portion of the laboratory, or the entire laboratory may be the designated area. The users should be thoroughly informed of the use and location of fume hoods.

Section 6—Special Handling Procedures and Storage Requirements
Describe special handling procedures and storage requirements including, (but not limited to): specific laboratory techniques; ventilation requirements; temperature controls; chemical incompatibilities; special containment devices; and access restrictions. If applicable, describe safe methods to transport the chemicals.

Section 7—Personal Protective Equipment (PPE)
List the PPE required for each activity or chemical. PPE includes gloves, laboratory coats, safety glasses, goggles, face shields, and respirators. If applicable, indicate the type of PPE (e.g., eye protection, goggles; protective clothing, apron; hand protection, gloves; foot protection, closed toe shoes or steel shoes; hearing protection, head protection, respiratory protection) needed for each phase of a process. The users of the laboratory should be thoroughly informed of the use and location of PPE.

Section 8—Engineering/Ventilation Controls
List any engineering controls used. An engineering hazard control is generally defined as equipment or physical infrastructure that reduces or removes hazards from the laboratory. It can include specifically selected and arranged experimental equipment. Common engineering controls include the fume hood, glove box, biosafety cabinet and laser interlock. The users should be thoroughly informed of the use and location of these controls.

Section 9—Spill and Accident Procedures
Describe procedures for handling potential emergencies related to this chemical or process such as accidental releases to the sanitary sewer, spills, fires, chemical burns to skin or eyes, shattered glassware, etc. Note the location of emergency equipment such as spill kits, emergency eyewash/showers, fire extinguishers, etc. Fire, Police, Rescue, Emergency Medical Service Phone numbers should be provided. The laboratory users should be trained to handle emergency procedure in case of wounds, thermal and chemical burns, ingestion and inhalation of chemicals.

Section 10 —Waste Disposal
Describe any unique waste disposal procedures for the chemicals.

Section 11—Decontamination
Discuss any appropriate decontamination procedures for equipment, glassware, and clothing.

Section 12 — Process Steps (Optional)

This section is useful for particularly complex or multi-step processes. List each step of the process or procedure chronologically, precautionary safety measures to be taken including the use of specific laboratory techniques and PPE. If possible, describe indicators (visual or otherwise) which show whether the reaction, equipment, etc. is working safely as intended or that a hazardous situation may be developing.

SOPs written for a particular laboratory should be reviewed by the Laboratory-in-charge (Laboratory manager) and at least one faculty member.

Annex VII: General requirement for worker health and safety

In Bangladesh the main law related to occupational health and safety is Labor Law 2006. The law has provisions on occupational hygiene, occupational diseases, industrial accidents, protection of women and young persons in dangerous occupation. The key salient features of the general requirements for the workers' health and safety stated in this law is presented in the following Table.

General requirements for Workers Health and Safety

Issues	Requirements
Health and Hygiene	• Cleanliness • Proper ventilation and temperature • Protection against dust and fumes • Disposal of wastes and effluents • Proper illumination • Provision of adequate latrines and urinals • Sufficient spittoons and dustbins
Safety	• Safety for building and equipment • Precautions in case of fire • Fencing of machinery • Floor, stair and passage way • Precautions during work on or near machinery in motion • Monitoring against carrying of excessive weights
Compensation for accidents at work	• Owner's responsibility for compensation • Amount of compensation • Report on fatal accident and treatment • Compensation on contract and contract registration • Scope for appeal
Dust and Fumes	• For any dust or fumes or other impurities likely to be injurious to the workers, effective measures shall be taken to prevent its accumulation and its inhalation by workers
Latrines and urinals	• Sufficient latrines and urinals shall be provided • Shall be maintained in clean and sanitary condition • Shall be adequately lighted and ventilated
Precautions in case of fire	• Shall be provided with means of escape in case of fire • Effective measures shall be taken to ensure that all the workers are familiar with the means of escape • Firefighting apparatus should be provided and maintained
First aid	• First aid facility should be provided and maintained. • Ensure one first aid box for every one hundred and fifty workers • Shall be kept with a responsible trained person who shall be available during the working hours
Disposal of wastes and effluents	• Provide with proper disposal system for solid waste and effluents. • In case of a factory where no public sewerage system exists, prior approval of the arrangements should be made for the disposal of wastes and effluents
Compensation	• If personal injury is caused to workmen by accident arising in the

Issues	Requirements
	course of employment, employer shall be liable to pay compensation • Monthly payment as compensation for temporary disablement are • Compensation should be paid for the period of disablement or for one year whichever period is shorter • Such compensation shall be paid at the rate of full monthly wages for the first two months • Two thirds of the monthly wages for the next two months and at the rate of the half of the monthly wages for the subsequent months • In case of chronic occupational diseases, half of the monthly wages during the period of disablement for a maximum period of two years shall be paid

Annex VIII: IFC/World Bank Group Occupational Health and Safety Guidelines for Fiber Optic Cable Installation

Workers involved in fiber optic cable installation or repair may be at risk of permanent eye damage due to exposure to laser light during cable connection and inspection activities. When extending a cable or mounting a cable connector, a microscope is typically attached to the end of the fiber optic cable allowing the worker to inspect the cable end and prepare the thin glass fibers for extension or connection assembly. Workers may also be exposed to minute or microscopic glass fiber shards that can penetrate human tissue through skin or eyes, or by ingestion or inhalation. Optical fiber installation activities may also pose a risk of fire due to the presence of flammable materials in high-powered laser installation areas.

Recommendations to prevent, minimize, and control injuries related to fiber optic cables installation and maintenance includes:

- Worker training on specific hazards associated with laser lights, including the various classes of low and high power laser lights, and fiber management;
- Preparation and implementation of laser light safety and fiber management procedures which include:
    - Switching off laser lights prior to work initiation, when feasible
    - Use of laser safety glasses during live optical fiber systems installation
    - Prohibition of intentionally looking into the laser of fiber end or pointing it at another person
    - Restricting access to the work area, placing warning signs and labeling of areas with potential for exposure to laser radiation, and providing adequate background
    - lighting to account for loss of visibility with the use of protective eyewear
    - Inspecting the work area for the presence of flammable materials prior to the installation of high-powered laser lights
- Implementation of a medical surveillance program with initial and periodic eye examinations;
- Avoiding exposure to fibers through use of protective clothing and separation of work and eating areas.

Reference: IFC and World Bank Group (2007) Environmental, Health and Safety Guidelines for Telecommunications. Available at the following link:
http://www.ifc.org/wps/wcm/connect/0985310048855454b254f26a6515bb18/Final%2B-%2BTelecommunications.pdf?MOD=AJPERES&id=1323152343828