

# Initial Environmental Examination (Draft)

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July 2019

## BAN: Improving Computer and Software Engineering Tertiary Education Project

### Volume 1 - Jessore University of Science and Technology

Prepared by the University Grants Commission of the Ministry of Education for the Asian  
Development Bank

## CURRENCY EQUIVALENTS

(as of 1 July 2019)

Currency unit	–	Taka (Tk)
Tk1.00	=	\$0.012
\$1.00	=	Tk84.255

## ABBREVIATIONS

ADB	–	Asian Development Bank
DOE	–	Department of Environment
ECA	–	Environment Conservation Act
ECC	–	environmental clearance certificate
ECR	–	Environment Conservation Rules
EIA	–	environmental impact assessment
EMP	–	environmental management plan
EMoP	–	environmental monitoring plan
IEE	–	initial environmental examination
MOE	-	Ministry of Education
MOEF	–	Ministry of Environment and Forests
PIU	–	project implementing unit
PMU	–	project management unit
SPS	–	Safeguard Policy Statement
UGC	-	University Grants Commission

## WEIGHTS AND MEASURES

°C	–	degree Celsius
dB(A)	–	A-weighted decibel
ha	–	hectare
mg/L	–	milligram per liter
m <sup>2</sup>	–	square meter
µg/m <sup>3</sup>	–	microgram per cubic meter
ppm	–	parts per million

## NOTE

- (i) In this report, "\$" refers to United States dollars.

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## TABLE OF CONTENTS

Page No.

### EXECUTIVE SUMMARY

- 1.0 INTRODUCTION
- 2.0 POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK
- 3.0 DESCRIPTION OF PROJECT
- 4.0 DESCRIPTION OF ENVIRONMENT (BASELINE DATA)
- 5.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES
- 6.0 ANALYSIS OF ALTERNATIVES
- 7.0 INFORMATION DISCLOSURE, CONSULTATION, AND PARTICIPATION
- 8.0 GRIEVANCE REDRESS MECHANISM
- 9.0 ENVIRONMENTAL MANAGEMENT PLAN
- 10.0 CONCLUSION AND RECOMMENDATION

### List of Tables

- Table 1.1 Project Outputs
- Table 2.1 Relevant Regulations
- Table 2.2 Relevant National Environmental Standards
- Table 2.3 Relevant Environmental Standards from IFC-WB EHS Guidelines 2007
- Table 2.4 Bangladesh Relevant International Environmental Agreements
- Table 2.5 Environmental Classification According to SPS 2009
- Table 2.6 Implications of SPS 2009 to the Project
- Table 3.1 Summary of building structure
- Table 4.1 Summary of Environment Setting within the Study Area
- Table 4.2 Results of Ambient Air Quality Measurements
- Table 4.3 Ambient Noise Level Measurements, Leq dB(A)
- Table 4.4 Groundwater Quality, JUST
- Table 4.5 Sources of drinking water
- Table 4.6 List of plant species within
- Table 5.1 Green building features, new ICT Centre for Excellence
- Table 5.2 Typical Noise Levels of Tools and Equipment
- Table 5.3 Common Sources of Noise and Decibel Levels
- Table 5.3 Key Elements of ERP (Draft)
- Table 6.1 Comparison of “with project” and “no project” options
- Table 7.1 Summary of consultation
- Table 9.1 Environmental Management Plan
- Table 9.2 Environmental Monitoring Plan

## **List of Figures**

Figure 1.1	Location Map
Figure 1.2	Project Management Structure
Figure 2.1	Approval process of DOE for ECC
Figure 3.1	Location of new building within JUST
Figure 3.2	Perspective front view of the ICT Building
Figure 4.1	Project's area of influence
Figure 4.2	Location of JUST
Figure 4.3	Location of the new building within JUST
Figure 4.4	Climate Region Map of Bangladesh
Figure 4.5	Ambient air quality sampling station, JUST
Figure 4.6	Seismic zone and flood-prone areas in Bangladesh
Figure 5.1	Diagrammatic view of green building features
Figure 5.2	Alternate access route to site
Figure 5.3	Temporary Waste Collection Area
Figure 5.4	Medical Centre (1 <sup>st</sup> floor and 2 <sup>nd</sup> floor)
Figure 8.1	Three-tier grievance redress mechanism

## **List of Appendixes**

Appendix 1	Environmental Code of Practice (ECoP)
Appendix 2	List of Participants and Photographs during Consultation
Appendix 3	Sample Complaint Form for GRM
Appendix 4	Terms of Reference, Environmental Safeguard Consultant, PMU
Appendix 5	Proposed Format of Environmental Monitoring Report during Construction Phase
Appendix 6	Proposed Format of Environmental Monitoring Report Post-construction
Appendix 7	Sample Environmental Site Inspection and Monitoring Checklist

## EXECUTIVE SUMMARY

### Introduction

The Government of Bangladesh (GOB) through the Ministry of Education (MOE), requested the Asian Development Bank (ADB) for financing of about \$100M to cover the costs of the project expected to improve the relevance and quality of computer science and engineering and information technology (CSE/IT) programs in selected universities. These universities are (i) University of Dhaka (DU), (ii) Bangladesh University of Science and Technology (BUET), (iii) Jessore University of Science and Technology (JUST), and the (iv) East West University (EWU).

The project will strengthen the preparation of graduates to take on jobs, improve the connection with industries to understand their requirements for human resource, and to create the required environment in developing the skills for entrepreneurship relevant to CSE/IT.

### Project Description

The proposed project will help improve relevance and quality of CSE/IT programs in selected universities. It aims to increase job-ready graduates, increase R&D capacity through industry collaboration and interdisciplinary research projects, and develop technology entrepreneurship. These objectives will be delivered through four outputs elaborated below:

Output	Description
Output 1: An established modern learning, research and startup supporting environment	Supports the four universities in developing classrooms, laboratories, industry collaboration and startup or incubation space, and auxiliary facilities. Establishment of the support environment will adopt green building features for energy efficiency, water saving, climate and disaster resilient design, access of persons with disabilities, and female-friendly amenities such as students' study areas and staff lounges, safety features like access control system, increased lighting at night, and video surveillance system.
Output 2: Quality and industry-relevant CSE/IT programs	Assists the universities in updating and improving their CSE/IT degree programs through the use of new technologies, blended learning, industry-demanded soft-skills, and strengthen the existing digital library to ensure that they are aligned with international standards.  JUST will set up an industry certification center for IT professionals in the southwest region. JUST, DU, and BUET will provide undergraduate scholarships to attract more female students to CSE/IT. There will be support to enable the IT industry introduce flexible working hours and telecommuting to boost women participation in the IT industry.
Output 3: Strengthened R&D and technology entrepreneurship	University Grants Commission (UGC) to provide grants on the following research initiatives: (i) industry collaboration addressing industry problems or in developing new products or services; (ii) interdisciplinary work on IT solutions that associate with other areas to develop new products or services; (iii) cutting edge CSE/IT research; and (iv) IT solutions to address disability issues. Research proposals can be developed together with foreign universities.

Output	Description
	There will be support also in introducing training programs on technology entrepreneurship as well as rules and incentives that would be instrumental to have more university-based startups and spinoff firms using the facility in Output 1.
Output 4: Strengthened tertiary education project design and management capacity	Supports GOB to carry out background studies, feasibility studies, and project preparatory activities for new tertiary education initiatives in priority economic sectors. Provides the required resources for effective project implementation and management.

From Output 1, the new building for JUST will involve a new, fully-furnished and complete 10-storey building of about 20,412 m<sup>2</sup> to accommodate a maximum of 900 undergraduate and graduate students, international level professional certification program, and test centers for IT professionals and English languages, incubators, and seminars/conference facilities. Given the location of JUST, vehicles will be provided to facilitate industry-related activities and conferences. The new building will also incorporate green building features and will be designed to be climate change resilient.

### Implementation arrangements

MOE will be the executing agency (EA) acting through UGC while the key implementing agencies (IAs) are JUST, DU, BUET, and EWU. A project management unit (PMU) will be set up at UGC and project implementation unit (PIU) at the four universities who will be responsible for the day-to-day management, monitoring, reporting, and coordination during implementation. A project steering committee (PSC) will be arranged at the MOE to provide guidance and direction, monitor and review the overall progress and outputs of project implementation. The PSC will be chaired by the Secretary, MOE with representatives consisting of UGC chairperson, assigned UGC member, vice chancellors of the four universities, and representatives from other agencies to ensure that the project achieves the targets and outcomes as well as coordination in resolving potential issues during implementation. An environmental safeguard consultant will be engaged at the PMU to provide technical support on compliance to ADB requirements.

### Environmental Requirements

The Environment Conservation Act (ECA) 1995 and the Environment Conservation Rules (ECR) 1997 are the main environmental regulations in Bangladesh which provides that no project or industrial unit can be undertaken without securing an environmental clearance certificate (ECC) from the Department of Environment (DOE). However, under President's Order No. 10 of 1973, UGC has the autonomy in the university education, and among others, in examining development plans within the universities. In which case, they are not within the purview of ECA 1995 and ECR 1997. The universities have their own development planning, engineering and maintenance units with adequate staff that oversee the projects needed to ensure the sustained provision of education in Bangladesh.

The Safeguard Policy Statement (SPS) 2009 sets out the requirements for environmental safeguard that applies to all ADB-financed projects and grants. Under SPS 2009, projects or grants are screened and categorized based on their potential environmental impacts.

Output 1 will involve construction of three new buildings in JUST, DU, and BUET; and renovation works at EWU. These interventions will have potential environmental impacts, and thus, following

SPS 2009, the project has been classified as category B on environment requiring the preparation of an initial environmental examination (IEE). Based on the requirements of SPS 2009, this IEE is prepared and will be publicly disclosed to ADB website. Aside from SPS 2009, disclosure of IEE is also required by the Access to Information Policy.

The IEE prepared for the project is presented in four volumes to cover the four implementing universities: (i) Volume 1 – JUST; (ii) Volume 2 – BUET, (iii) Volume 3 – DU, and (iv) Volume 4 – EWU. This Volume 1 of the IEE will discuss the due diligence of the new building for JUST.

## **Description of the Existing Environment**

JUST is a public university established in 2007 and is now located within an area of about 14.2 hectares (or 142,000 m<sup>2</sup>). The new building will be located within the premises of JUST and will occupy about 20,412 m<sup>2</sup> (or 14% of the total area). There are no natural water sources, protected areas or ecologically-sensitive areas adjacent of near the university but there is Research Pond under the Fisheries Department located west of the site. JUST has several academic buildings including mosque, hostel, staff dormitory/housing, and a 25-bed capacity medical centre.

The site is flat terrain with average elevation of about 8 m above mean sea level. The annual average maximum temperature is about 31°C and minimum temperature of about 16°C. Annual average rainfall is about 1,402 mm and relative humidity varying from 67% to 84%. The area lies in the southwestern region of Bangladesh considered as low flood risk zone and within seismic zone III (low intensity seismic zone). The JUST area is within the low lying agricultural land that is used to be cultivated bi-annually.

Environmental quality measurements were carried out in March 2019 by the Department of Environmental Science and Technology of JUST for three sampling stations on ambient air quality and noise, and groundwater quality from their water source. Results indicate that PM<sub>2.5</sub> and noise limits of the Bangladesh ambient air quality standards (2005) and noise level (2006), respectively were exceeded in three sampling stations. At the time of sampling, there are three ongoing building constructions within JUST. Groundwater quality meets the limits for pH, fecal coliform, arsenic, lead, cadmium, and hexavalent chromium set by Schedule 3b, Rule 12 of ECR 1997. There are around 5,000 plants from 75 different species planted to open spaces within the campus to improve its landscape.

## **Anticipated Impacts and Mitigation Measures**

The new building will incorporate green building features which aim to reduce energy and water consumption, and thus, also expected to be a climate change-resilient building. These features are included in the budget with estimated cost of about 10% the total project cost on civil works (or about \$1.461 million).

Prior to construction works, the PMU in UGC and the PIU in JUST will ensure that the Contractor will include the responsibility of compensating for any temporary damage, loss or inconvenience as a result of accident or failure to comply with regulations in implementing the project. PMU and PIU together with the environmental safeguard consultant will conduct an orientation to the Contractor and their workers about their responsibility to compliance of environmental requirements, awareness of diseases such as HIV/AIDS and tuberculosis, and adherence to best practices in construction on occupational health and safety.

Associated environmental impacts are mainly during construction such as increased noise and dust levels, occupational and community safety risks, generation of waste, movements of construction vehicles, presence of workers within the premises of JUST, and similar impacts due to civil, mechanical and electrical works for the new building. The Contractor will be required to prepare a construction management plan describing the commitments to implement measures in managing these temporary impacts aside from compliance to the environmental management plan. Alternate access route will be used to avoid construction vehicles passing through the main entrance of JUST along the Churamonkathi - Chaugachha Road.

Construction site will be temporarily enclosed with clear and proper demarcation to separate access of university students, faculty, and administrative staff. Contractor will designate security personnel to prevent unauthorized access to the construction site. The use of personal protective equipment and safety gears such as hardhats, working gloves, ear muffs, goggles, masks and similar safety protection will be mandatory. Contractor will provide sanitary facilities, safe drinking water, first aid kit, and fire-fighting system. Good housekeeping at the work site and temporary space during break-time will be enforced at all times. Toolbox meetings will be conducted daily prior to start of work to reinforce the importance of safety in the workplace and compliance to construction site rules and regulations.

The PIU will ensure that ambient air quality limits set by the International Finance Corporation (IFC)-World Bank (WB) Environmental, Health, and Safety (EHS) General Guidelines 2007, the Bangladesh National Ambient Air Quality Standards (2005), and the Noise Pollution (Control) Rules 2006 will not be exceeded during construction. The PIU and the environmental safeguard consultant will monitor compliance of the Contractor.

### **Analysis of Alternatives**

No alternative site was considered for the new building as this is the best option in terms of ownership, adequate area, and availability. The “no project” option will mean that the open green space within JUST will not have its best and highest usage of land. At the same time, the undergraduate and graduate students, faculty, and staff of CSE Department will not have the opportunity to benefit from innovative IT learning environment that the new building will provide.

“With project” option entails that the demand for IT graduates to meet the requirements of the IT industry will be met, temporary jobs for skilled and non-skilled workers during construction will be created, and there will be more options for R & D, training, and link to the private sector which are expected to improve chances of graduates for employment.

### **Information Disclosure, Consultation and Participation**

A total of 16 participants (five females and 11 males) joined the consultation meeting on 1 April 2019 in JUST. Issues raised were potential noise and dust levels during construction, access to the building of persons with disability on mobility and vision, workers’ behavior and access to students’ areas, waste management, and emergency preparedness. The PIU in JUST will ensure that these concerns are taken into consideration in the building design and during construction phase.

Consultations will continue during project implementation. A project brief (a one-page flyer or a Q&A) both in English and Bangla will be made available at the PIU, construction site office, PMU, and JUST administration office. The project brief will be posted to JUST website. The IEE, which



provides more information, will be posted to the ADB website following SPS 2009 and Access to Information Policy.

### **Grievance Redress Mechanism**

The PMU at UGC will establish grievance redress mechanism (GRM) to deal with potential complaints that may be lodged on the project. Part of the GRM will be to create a grievance redress committee (GRC) that may consist of: PMU Head, representative from the local government, representative of Contractor, and witness of the complainant. The environmental safeguard consultant at the PMU will act as the secretary of the GRC. Complaint can be lodged either in person to the Site Engineer, in writing or by phone. A complainant can seek redress in three-tiers: (i) through the site engineer of the Contractor or PIU level, (ii) through the GRC, and (iii) or through the DOE under the Environment Court Act 2010. The complainant is not restricted to seek redress through the legal system at any point in the GRM process.

The PIU will disclose details on GRM through the project website of JUST as well as in the billboards at the construction site. Details will include the contact person, a hotline phone number, and a simplified flowchart on how to file a complaint. If needed, the environmental safeguard consultant will provide assistance to the affected person in submitting a complaint.

### **Environmental Management Plan**

The environmental management plan (EMP) describes the measures to be implemented to ensure that the identified impacts during construction and post-construction are mitigated. The EMP includes an environmental monitoring plan (EMoP) identifying the parameters to be monitored, frequency of monitoring, location, implementing responsibility, and supervision (see Table 9.1 and Table 9.2, respectively). The cost of implementing the EMP and the EMoP will be part of the Contractor's budget.

As soon as the project becomes effective, the PIU through the PMU, will prepare environmental monitoring reports and will be submitted to ADB semi-annually during construction and annually post-construction. These monitoring reports will be posted in the ADB website following the requirements of SPS 2009, and Access to Information Policy. The PIU will designate a staff to coordinate with the environmental safeguard consultant at the PMU in submitting environmental monitoring reports and other concerns on environmental safeguard compliance.

### **Conclusion and Recommendation**

While the project will have associated environmental impacts during construction phase, overall, it will have significant contribution in advancing the goals of Vision 2021 through improving computer and software engineering tertiary education.

The project is environment category B based on SPS 2009 and an IEE was prepared. Stakeholders were consulted and a grievance redress mechanism will be set-up consistent with the requirements of SPS 2009. Potential environmental impacts of the project are mainly during construction which are considered temporary, of short duration, and can be easily mitigated through the implementation of the EMP and EMoP, compliance of the Contractor to the approved building design and relevant regulations, and compliance monitoring of the PIU. An environmental safeguard consultant will provide the required technical support to the PIU and the PMU in ensuring that the environmental requirements of ADB are complied.

## 1.0 INTRODUCTION

To celebrate the 50<sup>th</sup> year of independence, Bangladesh launched the Vision 2021 which embodies measures to achieve the eight goals identified. The goals identified in Vision 2021 reflect a future Bangladesh as an economically inclusive and politically accountable society.<sup>1</sup> These goals are: (i) to become a participatory democracy; (ii) to have an efficient, accountable, transparent and decentralised system of governance; (iii) to become a poverty-free middle-income country; (iv) to have a nation of healthy citizens; (v) to develop a skilled and creative human resource; (vi) to become a globally integrated regional economic and commercial hub; (vii) to be environmentally sustainable; and (viii) to be a more inclusive and equitable society.

Part of the goal to develop a skilled and creative human resource is to ensure that Bangladesh will be known as a country of educated people with skills in information technology. In addition, one of the outcomes visualized for education, training, and skills development in Vision 2021 is to have established an informed, knowledge-based, technologically-oriented, and gender equitable learning system.<sup>2</sup>

To achieve these goals, the Government of Bangladesh (GOB) through the Ministry of Education (MOE), requested the Asian Development Bank (ADB) for financing of about \$100M to cover the costs of the project expected to improve the relevance and quality of computer science and engineering and information technology (CSE/IT) programs in selected universities. These universities are (i) University of Dhaka (DU), (ii) Bangladesh University of Science and Technology (BUET), (iii) Jessore University of Science and Technology (JUST), and the (iv) East West University (EWU).

### 1.1 Overview of the Project

Specifically, the project is expected to strengthen the preparation of graduates to take on jobs, improve the connection with industries to understand their requirements for human resource, and to create the required environment in developing the skills for entrepreneurs relevant to CSE/IT. Table 1.1 presents the four project outputs while Figure 1.1 presents the project location.

**Table 1.1 Project Outputs**

Output	Description
Output 1: An established modern learning, research and startup supporting environment	Supports the four universities in developing classrooms, laboratories, industry collaboration and startup or incubation space, and auxiliary facilities. Establishment of the support environment will adopt green building features for energy efficiency, water saving, climate and disaster resilient design, access of persons with disabilities, and female-friendly amenities such as students' study areas and staff lounges, safety features like access control system, increased lighting at night, and video surveillance system.
Output 2: Quality and industry-relevant CSE/IT programs	Assists the universities in updating and improving their CSE/IT degree programs through the use of new technologies, blended learning, industry-demanded soft-skills, and

<sup>1</sup> Center for Policy Dialogue, *Bangladesh Vision 2021*, August 2007. <http://cpd.org.bd/wp-content/uploads/2007/08/Bangladesh-Vision-2021-English.pdf>.

<sup>2</sup> Government of the People's Republic of Bangladesh, General Economics Division, *Outline Perspective Plan of Bangladesh 2010-2021, Making Vision 2021 A Reality*, June 2010. [https://unctad.org/meetings/en/Contribution/dtl\\_eWeek2018c03-bangladesh\\_en.pdf](https://unctad.org/meetings/en/Contribution/dtl_eWeek2018c03-bangladesh_en.pdf).

Output	Description
	strengthen the existing digital library to ensure that they are aligned with international standards.  JUST will set up an industry certification center for IT professionals in the southwest region. JUST, DU, and BUET will provide undergraduate scholarships to attract more female students to CSE/IT. There will be support to enable the IT industry introduce flexible working hours and telecommuting to boost women participation in the IT industry.
Output 3: Strengthened R&D and technology entrepreneurship	University Grants Commission (UGC) to provide grants on the following research initiatives: (i) industry collaboration addressing industry problems or in developing new products or services; (ii) interdisciplinary work on IT solutions that associate with other areas to develop new products or services; (iii) cutting edge CSE/IT research; and (iv) IT solutions to address disability issues. Research proposals can be developed together with foreign universities.  There will be support also in introducing training programs on technology entrepreneurship as well as rules and incentives that would be instrumental to have more university-based startups and spinoff firms using the facility in Output 1.
Output 4: Strengthened tertiary education project design and management capacity	Supports GOB to carry out background studies, feasibility studies, and project preparatory activities for new tertiary education initiatives in priority economic sectors. Provides the required resources for effective project implementation and management.

Source: Development Project Proposal, MOE

## 1.2 Project Implementation Arrangements

MOE will be the executing agency (EA) acting through UGC while the key implementing agencies (IAs) are JUST, DU, BUET, and EWU. A project management unit (PMU) will be set up at UGC and project implementation unit (PIU) at the four universities who will be responsible for the day-to-day management, monitoring, reporting, and coordination during implementation. A project steering committee (PSC) will be arranged at the MOE to provide guidance and direction, monitor and review the overall progress and outputs of project implementation. The PSC will be chaired by the Secretary, MOE with representatives consisting of UGC chairperson, assigned UGC member, vice chancellors of the four universities, and representatives from other agencies to ensure that the project achieves the targets and outcomes as well as coordination in resolving potential issues during implementation.

An environmental safeguard consultant will be engaged intermittently until the completion of construction phase (about 2 years) to provide technical support to the PMU and PIUs on compliance to environmental requirements of ADB, and the building construction requirements of the government. The project is expected to be implemented from January 2020 until June 2025. Figure 1.2 presents the project management structure.



Figure 1.1 Location Map

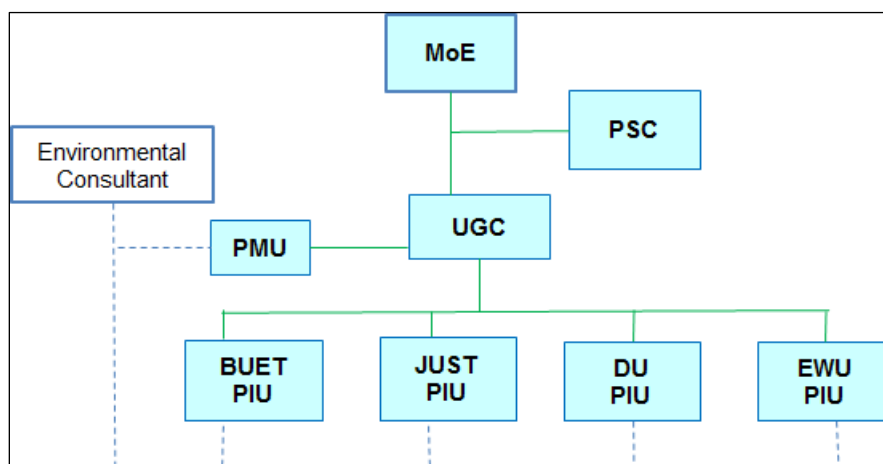


Figure 1.2 Project Management Structure

## 1.3 Need for Environmental Assessment

### 1.3.1 Requirements of the Government

The Environment Conservation Act (ECA) 1995 and the Environment Conservation Rules (ECR) 1997 are the main environmental regulations in Bangladesh which provides that no project or industrial unit can be undertaken without securing an environmental clearance certificate (ECC) from the Department of Environment (DOE). The DOE is the government agency authorized to regulate and enforce environmental management regulations to ensure that development projects are implemented sustainably, and to conserve and manage the environment in Bangladesh.

However, under President's Order No. 10 of 1973, UGC has the autonomy in the university education, and among others, in examining development plans within the universities. In which case, they are not within the purview of ECA 1995 and ECR 1997. The universities have their own engineering and maintenance units with adequate staff that oversee the development projects needed to ensure the sustained provision of education in Bangladesh.

### 1.3.2 Requirements of ADB

The Safeguard Policy Statement (SPS) 2009 of ADB sets out the requirements for environmental safeguard which applies to all the projects and grants they finance.<sup>3</sup>

SPS 2009 requires that projects to be funded by ADB will be subject to screening and categorization based on their potential environmental impacts. The categorization determines the required environmental assessment.

Given the associated civil works that will be involved in the construction of the new buildings, the project is classified as category B on environment requiring an initial environmental examination (IEE). A category B project is considered likely to have adverse environmental impacts that are less adverse, site-specific, few if any of them irreversible, and in most cases mitigation measures can be more readily designed.

## 1.4 IEE Methodology

**Objectives** Preparation of an IEE aims to (i) describe the existing environment; (ii) assess the potential environmental impacts of the proposed project; (iii) identify the mitigation and/or enhancement measures corresponding to the potential environmental impacts identified; (iv) describe the environmental management and monitoring plan to be implemented and complied; and, (v) ensure that all the statutory regulatory requirements relevant to the project have been identified and considered to ensure an understanding of what needs to be complied.

**Scope** This IEE was prepared following the requirements of SPS 2009 of ADB. The scope covers the general existing environmental profile of the project site, assessment of potential environmental impacts during design and/or pre-construction, construction, and operation (or post-construction) stages; and a description of the environmental management plan (EMP) and environmental monitoring plan (EMoP). The following steps were considered:

- (i) Undertake site visits to collect relevant secondary data to establish the baseline environmental condition;

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<sup>3</sup> ADB. Safeguard Policy Statement 2009. <https://www.adb.org/documents/safeguard-policy-statement>

- (ii) Assess the potential impacts due to location, design, construction and post-construction of the CSE/IT building;
- (iii) Examine opportunities for environmental enhancement and identify measures;
- (iv) Prepare an EMP outlining the measures to mitigate potential environmental impacts including the institutional arrangements;
- (v) Identify key environmental parameters required to be monitored during project implementation and prepare an EMoP;
- (vi) Carry out consultation with affected stakeholders, local administrative bodies to identify perceptions of the project, introduce project components and anticipated impacts; and,
- (vii) Disclose the draft IEE in ADB website and prepare project brief and/or FAQs in Bangla that can be publicly available at the offices of UGC, JUST, BUET, DU, EWU, and the construction sites.

Specifically for JUST, site visits were conducted in January, March and April 2019 to collect secondary data, conduct consultations, and coordinate with relevant agencies of the government.

### **1.5 Structure of the Report**

Following the requirements of SPS 2009, the environmental assessment for the project is presented as follows:

Volume 1 – IEE of JUST  
Volume 2 – IEE of BUET  
Volume 3 – IEE of DU  
Volume 4 – IEE of EWU

The IEE for each university is based on the EIA format given in Annex to Appendix 1 of SPS 2009, pp41-43.

## **2.0 POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK**

### **2.1 National environmental requirements**

The following presents the relevant regulatory agency, process, regulations and international environmental agreements.

#### **2.1.1 Environmental agency**

The Ministry of Environment and Forests (MOEF) is the agency that plans, promotes, coordinates and oversees the implementation of programs and plans on environment and forestry. MOEF manages all national environmental matters and is responsible for activities such as prevention and control of pollution, forestation and regeneration of degraded areas and protection of the environment, and in the framework of legislations. MOEF also conducts surveys, impact assessment, control of pollution, research, and collection and dissemination of environmental information and creation of environmental awareness among all sectors in Bangladesh.

Created in 1989, the DOE performs the regulatory functions of the MOEF. DOE is the main agency entrusted with regulating and enforcing environmental management regulations in order to ensure sustainable development and to conserve and manage the environment. DOE ensures the consistent application of environmental rules and regulations, and provides guidance, training and promotional campaign on improving the awareness of environmental issues.

#### **2.1.2 Environmental regulations**

The main environmental regulations in Bangladesh are the *Environment Conservation Act* (ECA) 1995 (amended 2000, 2002, 2007 and 2010) and the *Environment Conservation Rules* (ECR) 1997.

ECA 1995 provides the requirements on environmental protection, improvement of environmental standards, and control and abatement of environmental pollution. Through the ECA 1995, the DoE is mandated to undertake any activity needed to conserve and enhance the quality of environment and to control, prevent and mitigate pollution.

ECR 1997 provides for the declaration of ecologically-critical areas, categorization of industries and projects and identified types of environmental assessments needed against respective categories of industries or projects. Among other things, these rules set (i) the National Environmental Quality Standards for ambient air, various types of water, industrial effluent, emission, noise, vehicular exhaust etc.; (ii) the requirement for and procedures to obtain ECC; and (iii) the requirement for the IEE and their based on categories of industrial and other development interventions.

The ECA 1995 and ECR 1997 outline the regulatory mechanism to protect the environment in Bangladesh. Aside from ECA 1995 and ECR 1997, Table 2.1 presents a summary of relevant environmental regulations.

**Table 2.1 Relevant Regulations**

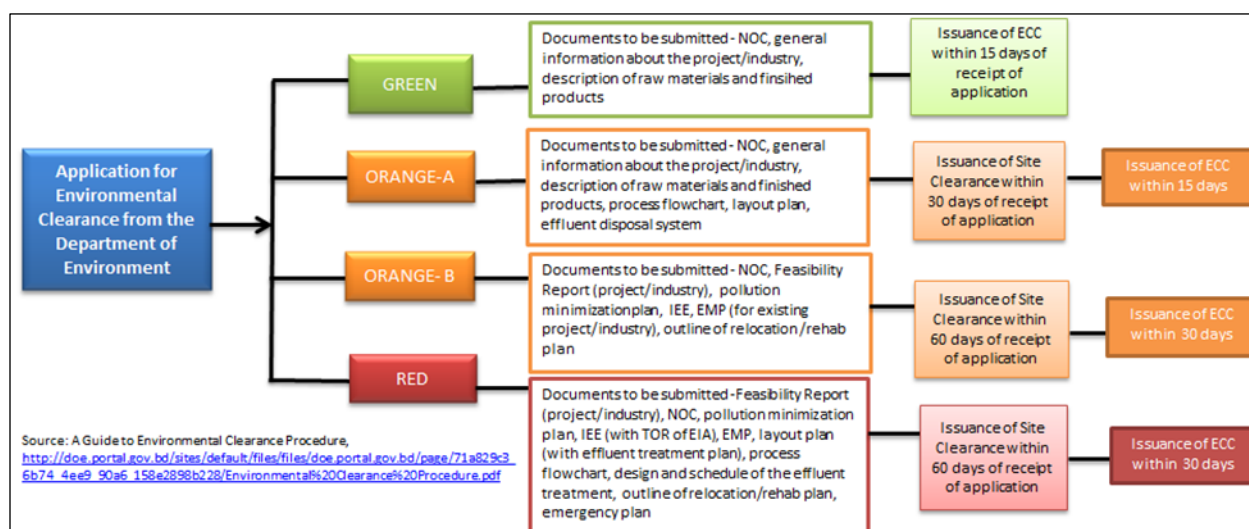
<b>Regulation</b>	<b>Brief Description</b>
Bangladesh National Building Code 2006	Sets minimum standards for design, construction, quality of materials, use and occupancy, location and maintenance of all buildings to safeguard, within achievable limits, life, limb, health, property and public welfare
Bangladesh Building Construction Rules 2008	These rules superseded the previous Building Construction (BC) rules of 1984. These rules seek to control development plot-by-plot and case-by-case. It controls development by imposing conditions on set backs, site coverage, construction of garages, access to plot, provision of lift, land use of that particular plot and height of building. Restricting the height of a building in BC Rules 1996 helps to control the density of an area and manage the growth of the city in some way.
Disaster Management Act 2012	Coordinates activities on disaster management, object-oriented and strengthened and to formulate rules to build up infrastructure of effective disaster management to fight all types of disaster
Environment Court Act 2000 (amended in 2002 and 2010)	This Act is under the Judiciary and MOEF to ensure the resolution of disputes on environmental and social damages resulting from any development activities. This Act also allows for the completion of environment-related legal proceedings effectively.
Vehicle Act 1927, the Motor Vehicles Ordinance 1983, and Bengal Motor Vehicle Rules 1940	These are under the Bangladesh Road Transport Authority (BRTA) which regulates vehicular emissions and noise including road safety.
Bangladesh Factories Act 1995	Requires every workplace including small or large scale construction where women are employed to have an arrangement of childcare services. Based on this Act and Labor Laws - medical facilities, first aid and accident and emergency arrangements are to be provided by the authority to the workers at workplaces.
Bangladesh Labour Act 2006 (amended 2013), Bangladesh Labor Rules 2015	These regulations are under the Ministry of Labour which provides for the occupational rights and safety of factory workers and the provision of comfortable work environment and reasonable working conditions including the prohibition of child labor and adolescent
The Antiquities Act 1968 (amended 1976)	Regulation on the preservation and protection of antiquities
The Embankment and Drainage Act, 1952	Consolidates the laws relating to Embankments and drainage providing provision for the construction, maintenance, management, removal and control of embankments and water courses for the better drainage of lands and for their protection from floods, erosion or other damage by water.

### 2.1.3 Environmental Approval Process



Section 12 of ECA 1995 provides that no industrial unit or project can be established or undertaken without securing an environmental clearance certificate (ECC) from the DOE. Following the requirements of ECR 1997, the DOE has classified various development interventions according to the potential adverse environmental impacts for the purpose of issuing the ECC. This classification includes: (i) green; (ii) orange-A; (iii) orange-B; and (iv) red. The Green classification refers to industries or projects considered to be relatively pollution-free, thus, no environmental study will be required. The Orange-A, Orange-B, and Red category are those projects and industrial units that may have potential adverse environmental impacts and therefore requires an environmental impact assessment (EIA). Securing the ECC for these categories involves two steps: (i) issuance of site clearance certificate (SCC), and then (ii) the ECC.

The SCC will be issued by the DOE upon approval of the initial environmental examination (IEE) and the receipt of the “No Objection Certificate (NOC).” These documents serve as “proof of authorization” to initiate a project. The IEE includes the terms-of-reference (TOR) of the EIA which requires the approval of the DOE. Once the EIA has been reviewed and approved by the DOE, the ECC will be issued. The project proponent cannot open line of credit in favor of importable machineries and cannot start any physical activities for the project without the DoE-approved EIA. Figure 2.1 presents the overview of the approval process.



**Figure 2.1 Approval process of DOE for ECC**

#### 2.1.4 Applicable environmental standards

**Table 2.2** lists the applicable standards to meet national regulations. SPS 2009 provides that during construction, the GOB will apply pollution prevention and practices that are in line with international good practice as given by international standards such as the IFC-WB EHS General Guidelines 2007. In addition, should the regulations of the Government differ from the levels and measures set by the IFC-WB EHS General Guidelines 2007, the Government will achieve whichever is more stringent. The relevant standards from IFC-WB EHS General Guidelines 2007 are given in Table 2.3.

**Table 2.2 Relevant National Environmental Standards**

<b>AIR<sup>a</sup></b>		
Pollutant	Standards	Averaging Period
NO <sub>x</sub>	100 µg/m <sup>3</sup> ( 0.053 ppm)	Annual
PM <sub>10</sub>	50 µg/m <sup>3</sup>	Annual
	150 µg/m <sup>3</sup>	24-hour
PM <sub>2.5</sub>	15 µg/m <sup>3</sup>	1-hour
	65 µg/m <sup>3</sup>	24-hour
<b>NOISE<sup>b</sup></b>		
Zone Class	Limits in dB(A)	
	Daytime	Nighttime
	(6 am – 9 pm)	(9 pm-6 am)
i) A sensitive area where quietness is of primary importance such as schools, hospitals, mosques etc.	50	40
ii) Residential zone	55	45
iii) Mixed areas, which are, used as residential areas as well as commercial and industrial purposes	60	50
iv) Commercial areas	70	60
v) Industrial areas	75	70
Day time shall mean from 6:00 am to 9:00 pm Night time shall mean from 10pm to 6:00 am Leq - energy mean of the noise level over a specific period <sup>a</sup> Ambient Air Quality Standards 2005 <sup>b</sup> Noise Pollution (Control) Rules 2006		

**Table 2.3 Relevant Environmental Standards from IFC-WB EHS Guidelines 2007**

Table 1.1.1: WHO Ambient Air Quality Guidelines <sup>7,8</sup>		
	Averaging Period	Guideline value in µg/m <sup>3</sup>
Sulfur dioxide (SO <sub>2</sub> )	24-hour	125 (Interim target-1) 50 (Interim target-2) 20 (guideline)
	10 minute	500 (guideline)
Nitrogen dioxide (NO <sub>2</sub> )	1-year	40 (guideline)
	1-hour	200 (guideline)
Particulate Matter PM <sub>10</sub>	1-year	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline)
	24-hour	150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)
Particulate Matter PM <sub>2.5</sub>	1-year	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline)
	24-hour	75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)
Ozone	8-hour daily maximum	160 (Interim target-1) 100 (guideline)

Table 1.7.1- Noise Level Guidelines <sup>54</sup>		
Receptor	One Hour L <sub>Aeq</sub> (dBA)	
	Daytime 07:00 - 22:00	Nighttime 22:00 - 07:00
Residential; institutional; educational <sup>55</sup>	55	45
Industrial; commercial	70	70

Source: World Bank Group-International Finance Corporation EHS General Guidelines 2007

## 2.1.5 Relevant International Environmental Agreements

Aside from the national environmental regulations, international environmental agreements where Bangladesh is a party will be referred to in the design and implementation of the project. Table 2.4 lists the applicable international environmental agreements that can provide guidance during project implementation.

**Table 2.4 Bangladesh Relevant International Environmental Agreements**

<b>International Environmental Agreement</b>	<b>Date Ratified</b>	<b>Description</b>
Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris 1972)	3 November 1983	Entered into force on 23 November 1972, this convention defines and provides for the conservation of the world's heritage by listing the natural and cultural sites whose value should be preserved.
Vienna Convention for the Protection of the Ozone Layer 22 March 1985	2 August 1990	A framework for efforts to protect the globe's ozone layer by means of systematic observations, research and information exchange on the effects of human activities on the ozone layer and to adopt legislative or administrative measures against activities likely to have adverse effects on the ozone layer.
Montreal Protocol on Substances that Deplete the Ozone Layer (a protocol to the Vienna Convention for the Protection of the Ozone Layer)	2 August 1990	This international treaty was entered into force on 1 January 1989 and is designed to protect the ozone layer by phasing out the production of numerous substances that are responsible for ozone depletion. This treaty also requires controlling emissions of substances that deplete ozone.
Kyoto Protocol (1997)	22 October 2001	An international agreement adopted on 11 December 1997 and entered into force on 16 February 2005, which commits its Parties to set internationally-binding emission reduction targets. This agreement is linked to the United Nations Framework Convention on Climate Change (UNFCCC).
UNFCCC (1992)	15 April 1994	This framework came into force on 21 March 1994 and aims to achieve stabilization of greenhouse gas (GHG) concentrations in the atmosphere at a level low enough to prevent dangerous anthropogenic interference with the climate system.
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989)	1 April 1993	This convention came into force on 5 May 1992 which aims to reduce the amount of waste produced by signatories and regulates the international traffic in hazardous wastes.
UNESCO World Heritage Convention 1972	3 August 1983 (Accession)  Accession – the state accepts the offer or the opportunity to become a party to a	This convention describes the concepts of nature conservation and the preservation of cultural properties. Parties agree to identify and nominate properties on their national territory to be considered for inscription on the World Heritage List, gives details of how

International Environmental Agreement	Date Ratified	Description
	treaty already negotiated and signed by other states	a property is protected, and provides a management plan for its upkeep.

## 2.2 Environmental Requirements of ADB

SPS 2009 sets the environmental requirements and review procedures that apply to all projects and grants that ADB finance. SPS 2009 comprises three key safeguard areas: environment, involuntary resettlement, and indigenous peoples; and aims to avoid adverse project impacts to both the environment and the affected people; minimize, mitigate and/or compensate for adverse project impacts; and help Borrowers to strengthen their safeguard systems and to develop their capacity in managing the environmental and social risks.

SPS 2009 uses a categorization system to indicate the significance of potential environmental impacts and is determined by the category of its most environmentally-sensitive component, including direct, indirect, cumulative, and induced impacts within the project's area of influence. The project categorization system is described in Table 2.5.

**Table 2.5 Environmental Classification According to SPS 2009**

Category	Definition	Assessment Requirement
A	Likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented, and may affect an area larger than the sites or facilities subject to physical works.	Environmental impact assessment (EIA)
B	Likely to have adverse environmental impacts that are less adverse than those of Category A. Impacts are site-specific, few if any of them irreversible, and in most cases mitigation measures can be designed more readily than Category A.	Initial Environmental Examination (IEE)
C	Likely to have minimal or no adverse environmental impacts.	No environmental assessment is required but the environmental implications of the project will be reviewed.
FI	Project involves investment of ADB funds to or through a financial intermediary (FI).	FIs will be required to establish an environmental and social management commensurate with the nature and risks of the FI's likely future portfolio to be maintained as part of the FI's overall management system.

Source: ADB. Safeguard Policy Statement 2009, p. 19. <http://www.adb.org/sites/default/files/institutional-document/32056/safeguard-policy-statement-june2009.pdf>.

## 2.2.1 Disclosure requirements

Aside from the SPS 2009 requirements, the Access to Information Policy provides for the requirements of disclosure for project information of projects and grants funded by ADB.<sup>4</sup> Consistent with SPS 2009, this requires the disclosure of documents submitted by the borrower and/or client:

- (i) a draft EIA report for category A project, at least 120 days before Board consideration;
- (ii) a draft environmental assessment review framework, where applicable, before appraisal;<sup>5</sup>
- (iii) the final EIA or IEE, upon receipt by ADB;
- (iv) a new or updated EIA or IEE, and a corrective action plan, if any, prepared during project implementation, upon receipt by ADB; and,
- (v) the environmental monitoring reports, upon receipt by ADB.

Table 2.6 presents a summary of the implications of SPS 2009 to the project.


**Table 2.6 Implications of SPS 2009 to the Project**

No.	SPS 2009 Principles	Description
1	Use a screening process for each proposed project, as early as possible, to determine the appropriate extent and type of environmental assessment so that appropriate studies are undertaken commensurate with the significance of potential impacts and risks.	The components with environmental implications have been identified under Output 1 of the Project: (a) construction of three new multi-storey buildings within the university premises of JUST, BUET, and DU; and (b) renovation and upgrading of the existing Computer Science and Engineering structure of the East-West University (EWU).  A Rapid Environmental Assessment (REA) checklist was completed for these components, and the environment category based on SPS 2009, is B requiring an IEE.
2	Conduct an environmental assessment for each proposed project to identify potential direct, indirect, cumulative, and induced impacts and risks to physical, biological, socioeconomic (including impacts on livelihood through environmental media, health and safety, vulnerable groups, and gender issues), and physical cultural resources in the context of the project's area of influence. Assess potential transboundary and global impacts, including climate change. Use strategic environmental assessment where appropriate.	An IEE following the requirements of SPS 2009 was conducted for the components with environmental implications.
3	Examine alternatives to the project's location, design, technology, and components and their potential environmental and social impacts and document the rationale for selecting the particular alternative proposed. Also consider the no project alternative.	Alternative sites, where appropriate, were considered and included in the IEE.
4	Avoid, and where avoidance is not possible, minimize, mitigate, and/or offset adverse	An EMP is included in the IEE for each of the components with environmental implications under the

<sup>4</sup> Access to Information Policy replaces Public Communication Policy 2011

<sup>5</sup> If no further mission for appraisal is required, the document will be posted before the management review meeting or the first staff review meeting for sovereign projects, or before the final investment committee meeting for nonsovereign projects, as applicable (ADB procedures).

No.	SPS 2009 Principles	Description
	impacts and enhance positive impacts by means of environmental planning and management. Prepare an environmental management plan (EMP) that includes the proposed mitigation measures, environmental monitoring and reporting requirements, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators. Key considerations for EMP preparation include mitigation of potential adverse impacts to the level of no significant harm to third parties, and the polluter pays principle.	four universities of the MOE. The EMPs will provide guidance to the construction contractor and their subcontractor (if any) who will be engaged during project implementation to ensure compliance to the relevant provisions in SPS 2009.
5	Carry out meaningful consultation with affected people and facilitate their informed participation. Ensure women's participation in consultation. Involve stakeholders, including affected people and concerned nongovernment organizations, early in the project preparation process and ensure that their views and concerns are made known to and understood by decision makers and taken into account. Continue consultations with stakeholders throughout project implementation as necessary to address issues related to environmental assessment. Establish a grievance redress mechanism to receive and facilitate resolution of the affected people's concerns and grievances regarding the project's environmental performance.	<p>Four consultations events were undertaken during the preparation of the IEE (i.e., one per university). Consultations will continue through the PIUs in each university (as appropriate) during project implementation.</p> <p>A three-tiered grievance redress mechanism (GRM) is included in the IEE including the proposed composition of the grievance redress committee (GRC). The implementation of the GRM will be monitored by the PMU established under the UGC.</p>
6	Disclose a draft environmental assessment (including the EMP) in a timely manner, before project appraisal, in an accessible place and in a form and language(s) understandable to affected people and other stakeholders. Disclose the final environmental assessment, and its updates if any, to affected people and other stakeholders.	The IEE will be endorsed by the MOE for public disclosure through the ADB website.
7	Implement the EMP and monitor its effectiveness. Document monitoring results, including the development and implementation of corrective actions, and disclose monitoring reports.	<p>At the construction phase, the contractor will be responsible for implementing the EMP and will be monitored by the PIU and PMU.</p> <p>Environmental monitoring reports and corrective actions (if needed) will be prepared by the PIUs and will be disclosed to ADB website.</p>
8	Do not implement project activities in areas of critical habitats, unless (i) there are no measurable adverse impacts on the critical habitat that could impair its ability to function, (ii) there is no reduction in the population of any recognized endangered or critically endangered species, and (iii) any lesser impacts are mitigated. If a project is located within a legally protected area, implement additional programs to promote and enhance the conservation aims of the protected area. In an area of natural habitats, there must be no significant conversion or degradation, unless (i) alternatives are not available, (ii) the overall benefits from the project substantially outweigh	All the proposed interventions with environmental implications are not located in critical habitats as defined by SPS 2009.

No.	SPS 2009 Principles	Description
	the environmental costs, and (iii) any conversion or degradation is appropriately mitigated. Use a precautionary approach to the use, development, and management of renewable natural resources.	
9	Apply pollution prevention and control technologies and practices consistent with international good practices as reflected in internationally recognized standards such as the World Bank Group's Environmental, Health and Safety Guidelines. Adopt cleaner production processes and good energy efficiency practices. Avoid pollution, or, when avoidance is not possible, minimize or control the intensity or load of pollutant emissions and discharges, including direct and indirect greenhouse gases emissions, waste generation, and release of hazardous materials from their production, transportation, handling, and storage. Avoid the use of hazardous materials subject to international bans or phaseouts. Purchase, use, and manage pesticides based on integrated pest management approaches and reduce reliance on synthetic chemical pesticides.	<p>Construction activities will generate waste and may increase ambient dust and noise levels. Vegetation and land clearing will be done. No hazardous chemicals will be used in vegetation clearing. The new buildings will use Energy Star certified products and will incorporate green building features.</p>  <a href="https://www.energystar.gov/about/energy-star-brand/energy-star-brand-book">https://www.energystar.gov/about/energy-star-brand/energy-star-brand-book</a>
10	Provide workers with safe and healthy working conditions and prevent accidents, injuries, and disease. Establish preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks to the health and safety of local communities.	Construction works may cause accidents or injuries to workers. Contractors will be required to comply with the EMP and implement to the extent possible the Environmental Codes of Practice. Compliance will be monitored by the PIUs and PMU.
11	Conserve physical cultural resources and avoid destroying or damaging them by using field-based surveys that employ qualified and experienced experts during environmental assessment. Provide for the use of "chance find" procedures that include a pre-approved management and conservation approach for materials that may be discovered during project implementation.	The sites are within the existing premises of the universities and are not known to have physical cultural resources as defined by SPS 2009.

### 3.0 DESCRIPTION OF THE PROJECT

The project will have four outputs as summarized in Table 1.1. The component that will have environmental implications from Output 1 (see below) will be the construction of new IT buildings for JUST, BUET, DU, and some renovations of classrooms and IT laboratories at EWU.

Output 1: An established modern learning, research and startup supporting environment	Supports the four universities in developing classrooms, laboratories, industry collaboration and startup or incubation space, and auxiliary facilities. Establishment of the support environment will adopt green building features for energy efficiency, water saving, climate and disaster resilient design, access of persons with disabilities, and female-friendly amenities such as students' study areas and staff lounges, safety features like access control system, increased lighting at night, and video surveillance system.
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For JUST, the project will involve a new, fully-furnished and complete 10-storey building of about 20,412 m<sup>2</sup> to accommodate a maximum of 900 undergraduate and graduate students, international level professional certification program, and test centers for IT professionals and English languages, incubators, and seminars/conference facilities. Given the location of JUST, vehicles will be provided to facilitate industry-related activities and conferences. Figure 3.1 shows the project site within the premises of JUST.

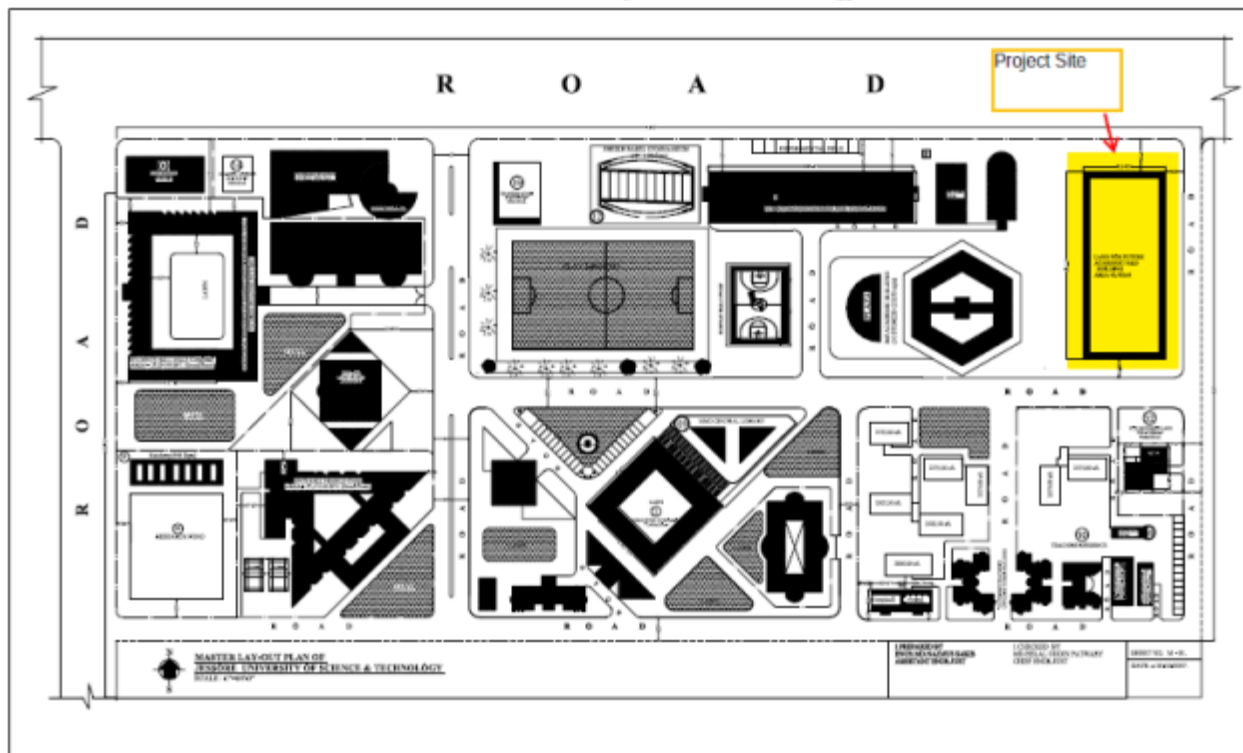


Figure 3.1 Location of new building within JUST

#### 3.1. Multi-storied Building



The new building will be known as the “**ICT Centre for Excellence**” in JUST. The summary of the building structure is given in Table 3.1 while Figure 3.2 shows the perspective front view of the proposed building.

**Table 3.1 Summary of building structure**

<b>Arrangement</b>	<b>Purpose</b>
Guests lounge for trainees and international trainers	Accommodation facility for about 100 hundred people. There will be some quadruple occupancy rooms for trainees and some single occupancy rooms for international trainers
Seminar rooms and conference halls	Rooms will be designed and equipped to be a showcase for organizing international conferences and seminars
Commercial zone for IT industries, incubation centre	Commercial space for around 10-15 IT industries for IT business with proper facilities including broadband internet connection, electrical facilities, etc. Also, there will enough space for software incubation centre
Professional and language training, online test centres	Space for training centres of Professional and English Language Certification courses and online test centres will be accommodated
Departmental laboratory and data centre	Space for CSE departmental laboratories and data centre given by GOB will be provided
Departmental laboratory	Space for CSE departmental laboratories to accommodate Diploma students
Teacher lounge	Office rooms, meeting rooms for the faculties of CSE Department, space for part-time teachers, visiting professors, and advisors
Class rooms, seminar library, and information booth	Class rooms for undergraduate and graduate students of the CSE Department, seminar library and information Help Desk
Parking and information area	Information Booth. Car parking for internal members and guest.

The total estimated cost of civil works will be \$14.61 million.



**Figure 3.2 Perspective front view of the ICT Building**

## 4.0 DESCRIPTION OF THE ENVIRONMENT (BASELINE DATA)

This chapter describes the existing environment within the study area and is based on baseline measurements but relied heavily on secondary data from government sources, international organizations and other research entities. Baseline measurements on ambient air quality, noise, and water supply in JUST were conducted on March 21, March 25 and March 31 by the Department of Environmental Science and Technology, JUST. Measurements were done within 500-meter radius from the project site (Figure 4.1).

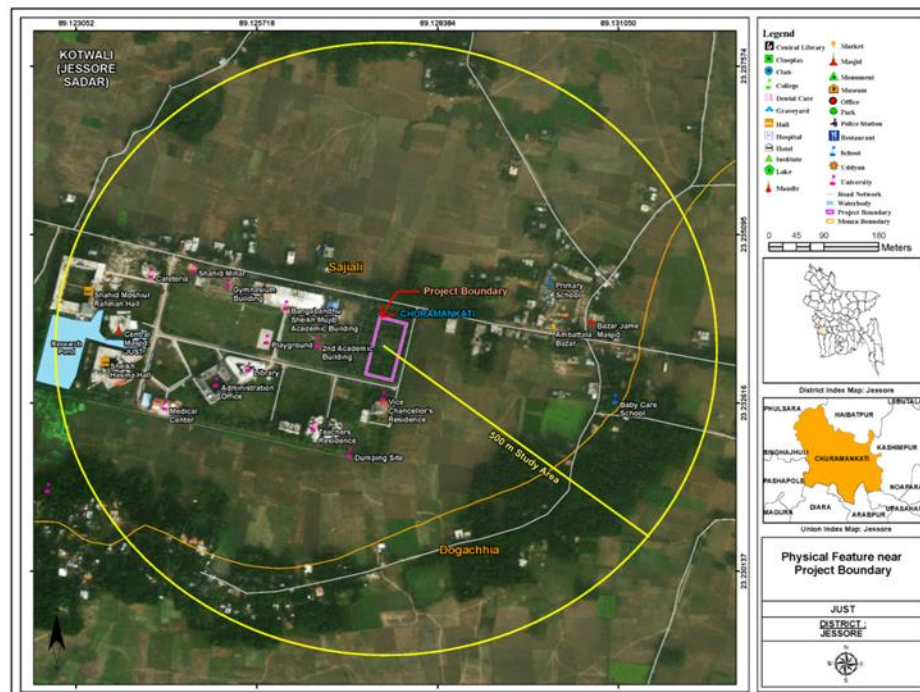


Figure 4.1 Project's area of influence

### 4.1 The Jashore University of Science and Technology

JUST is a public university established in 2007 and is now located within an area of about 14.2 hectares (or 142,000 m<sup>2</sup>). The new building will occupy about 20,412 m<sup>2</sup> (or 14% of the total area). The university is bounded on the north by the Churamonkathi-Chaugacha Road (a regional road), the Islampur village under Dogachhia union on the south, a “Baby Care School” and agricultural land on the east and the Research Pond under the Fisheries Department on the west. There are no natural water sources, protected areas or ecologically-sensitive areas adjacent to or near the university.

JUST has several academic buildings including mosque, dormitories to serve university student, faculty members and administrative staff, and a 25-bed capacity medical centre. Table 4.1 presents a summary of the environment setting within the study area. Figure 4.2 shows the location of JUST while Figure 4.3 shows the site for the new building within the premises of JUST.



**Figure 4.2 Location of JUST**

**Table 4.1 Summary of Environmental Setting within the Study Area**

Item	Details
Location	Jessore District under – Sajiali Mouza, Churamankati Union, Kotwali (Jessore Sadar) Thana.
Latitude	23.233415
Longitude	89.127631
General elevation	Average ground elevation 8.0 m above mean sea level
Topography	Flat terrain and land is relatively plain.
Major physiographic unit	Ganges River floodplain
Soil type	Sandy silt
Climatic condition	Subtropical monsoon climate where rainy season is hot and humid having about 85% of the annual rainfall. Winter is predominately cool and dry while summer is hot and dry interrupted by occasional heavy rainfall and thunderstorms. The annual average maximum temperature is about 31°C and minimum temperature of about 16°C. Annual average rainfall is about 1402 mm and relative humidity varying from 67% to 84%.
Flooding	Area lies in the southwestern region of Bangladesh considered as low flood risk zone
Seismicity	Area is within Zone III (i.e., low intensity seismic zone)
Present site land status	University area is within the low lying agricultural land that is used to be cultivated bi-annually
Nearest water bodies	University Research pond is about 400 m from the project site
Ecologically-critical area	No ecologically-critical area
Reserve/Protected forests	No reserve/protected forests

Item	Details
Archeologically-important place	There is no known archeologically-important site.
Major settlements	Islampur, Doragachhia, Sajiali villages



**Figure 4.3 Location of the new building within JUST**

## **4.2 Physical Environment**

### **4.2.1 Geology**

Jashore is located in the southwestern part of the Bengal Basin, a long established area of subsidence and deposition containing an almost complete sequence from the Cretaceous to Recent alluvium. The surface geology consists mainly of Quaternary sediments, although there are some tertiary deposits in the eastern flood belt. Clay soils are prevalent in the low laying areas, and medium textured soils at the higher grounds.

Jashore is included in hydrogeological unit II of Holocene Deltaic and Piedmont Plains. Deltaic and piedmont deposits are mainly consist of unconsolidated sand, silt and clay of varying thickness. The aquifer system in the area consists of a number of aquifers occurring at various depths at various position of the hydrogeological unit. The aquifers are separated by clayey aquitards. The number of aquifers in the area is less in the northern part whereas there are up to four aquifers in the southern part. The shallow aquifer varies widely in thickness with the region and accordingly depth of the deep aquifer also varies. The shallow aquifer is thicker towards the north.

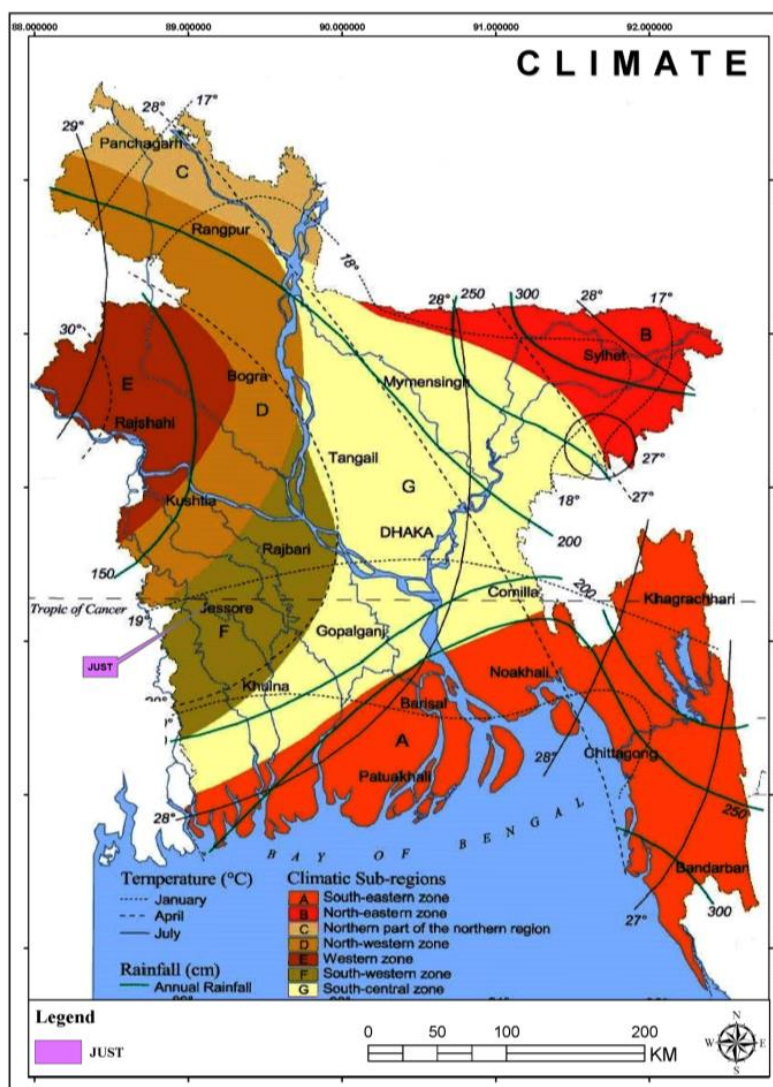
### **4.2.2 Climate**

The project area experiences a tropical monsoon climate characterized by four main seasons namely, winter (December-February), summer (March-May), monsoon (June-September) and the post monsoon or autumn season (October-November). Climate region map of Bangladesh is given in Figure 4.4.

The rainy season is hot and humid, and characterized by heavy rainfall, tropical depression and cyclone. The winter is predominately cool and dry. The summer is hot and dry interrupted by



occasional heavy rainfall and thunderstorms. Gentle north/north-westerly winds with occasional violent thunderstorms called northwester during summer and southerly wind with occasional cyclonic storm during monsoon are prominent wind characteristics of the region.



**Figure 4.4 Climate Region Map of Bangladesh**

Data recorded from 2011-2015 at the Jashore Station of the Bangladesh Meteorological Department were used to describe the meteorological condition within the study area.

May is the hottest month with monthly average maximum temperature reaching 33.22°C. In June, there is sharp fall in temperature due to the outbreaks of monsoon. During the monsoon, the monthly average temperature is about 29°C. The cool dry winter season begins in November, and January is the coldest month with an average minimum of about 17°C.

Average annual rainfall is about 1,402 mm. Normally, rainy season starts towards the end of May and ends in October. Heavy rainfall occurs in July, August and September compared to other months. In March and April, some rainfall also occurs due to Northwester. Winter is dry period

with little or nearly no rainfall. The maximum average relative humidity is 84% occurring in August while the minimum is 67% in March.

#### 4.2.3 Air quality and noise

There is no record of ambient air quality monitoring within the study area from the DOE. Existing sources of air pollution are vehicular emissions, unpaved roads, and from daily activities of farming near the campus and from settlements. There is no industry or brick field. The study area is rural with JUST as the central public institution.

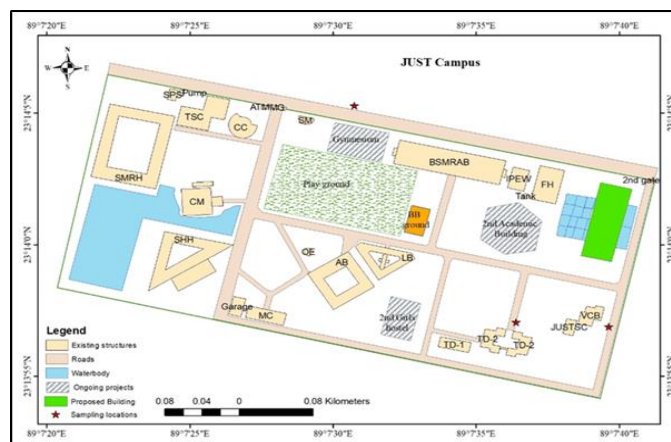
Baseline ambient air quality measurements were conducted on March 21, March 25, and March 31, 2019 by the Department of Environmental Science and Technology of JUST on a 24-hour averaging time. Parameters measured were PM<sub>2.5</sub>, PM<sub>10</sub>, and NO<sub>2</sub> using portable air quality monitoring instruments at three sites around the project site.<sup>6</sup> At the time of sampling, there were three ongoing major building constructions within the premises of JUST. Table 4.2 presents the results of measurements while Figure 4.5 shows the sampling location.

**Table 4.2 Results of Ambient Air Quality Measurements**

No.	Location	PM <sub>2.5</sub>	PM <sub>10</sub>	NO <sub>2</sub>
1	In front of Vice Chancellor's Residence within JUST premises	115	121	73
2	In front of 10-story dormitory/staff housing	114	115	75
3	Settlements near Shadhinota Shorok Road	115	134	74
Bangladesh ambient air quality standards (2005)		65 µg/m <sup>3</sup> (24-hr)	150 µg/m <sup>3</sup> (24-hr)	100 µg/m <sup>3</sup> (annual)
IFC-WB EHS Guidelines (2007)		25 µg/m <sup>3</sup> (24-hr)	50 µg/m <sup>3</sup> (24-hr)	200 µg/m <sup>3</sup> (1-hr)

Results suggest that PM<sub>2.5</sub> levels in all the three sampling stations exceeded the national limits and the IFC-EHS Guideline 2007 while PM<sub>10</sub> levels exceeded the national limits.

<sup>6</sup> Ambient air quality measuring instruments were acquired through the Higher Education Quality Enhancement Project (2018) funded by the World Bank



**Figure 4.5 Ambient air quality sampling station, JUST**

Ambient noise levels were also measured the same time as the ambient air quality sampling in the same stations. Results of 24-hour noise level measurements are given in Table 4.3.

**Table 4.3 Ambient Noise Level Measurements,  $L_{eq}$  dB(A)**

No.	Location	Daytime (6 AM to 9 PM)	Nighttime (9 PM to 6 AM)
1	In front of Vice Chancellor's Residence within JUST premises	67*	47*
2	In front of 10-story dormitory/staff housing	81*	47*
3	Settlements near Shadhinota Shorok Road	82*	50*
Bangladesh noise limits (Noise Pollution Control Rules 2006)	Sensitive zone/area	50	40
	Residential area	55	45
IFC-WB EHS Guidelines 2007	Residential, institutional, educational	55 (7AM-11PM)	45 (11PM-7AM)

#### 4.2.4 Water resources and quality

There is no natural surface water source within the study area. The University Research pond is about 400 m from the site of the proposed new building. Bhairab River runs parallel to the study area but is about 2.4 km from the site.

The Jashore *Pourashava* belongs to the hydrogeological unit II of Holocene Deltaic and flood Plains. Groundwater is available and water table does not go beyond suction limit throughout the year. The water of shallow layer contains iron but water of deep layer does not contain excessive iron. Arsenic is not reported to be a problem in both deep and shallow aquifer.

As water supply, JUST uses three deep tubewells drilled within the campus premises.<sup>7</sup> Of the three deep tubewells, two tubewells are used as drinking water supply and one tubewell for irrigation and general purposes. The capacity of each pump is 600 l/min to 800 l/min. There is no

<sup>7</sup> Personal comm., Chief Engineer, JUST



central water purifying system in JUST. Water filtration systems are installed within the academic buildings and residents in the housing/dormitory. Each building has their own RCC overhead water tank. Table 4.4 presents the groundwater quality in JUST from sample collected in front of the central cafeteria while Table 4.5 lists the distribution of water supply within the campus premises.

**Table 4.4 Groundwater Quality, JUST**

<b>Water Quality Parameter</b>	<b>Unit of Measure</b>	<b>Drinking Water Standards (Schedule 3b, Rule 12 of ECR 1997)</b>	<b>Groundwater sample</b>
Fecal coliform	n/100 ml	0	0
pH	-	6.5-8.5	8.5
Arsenic	mg/l	0.05	0.012
Lead (Pb)	mg/l	0.05	Less than 0.03
Cadmium (Cd)	mg/l	0.005	Less than 0.02
Chromium (Cr <sup>+6</sup> )	mg/l	0.05	Less than 0.01

**Table 4.5 Sources of drinking water**

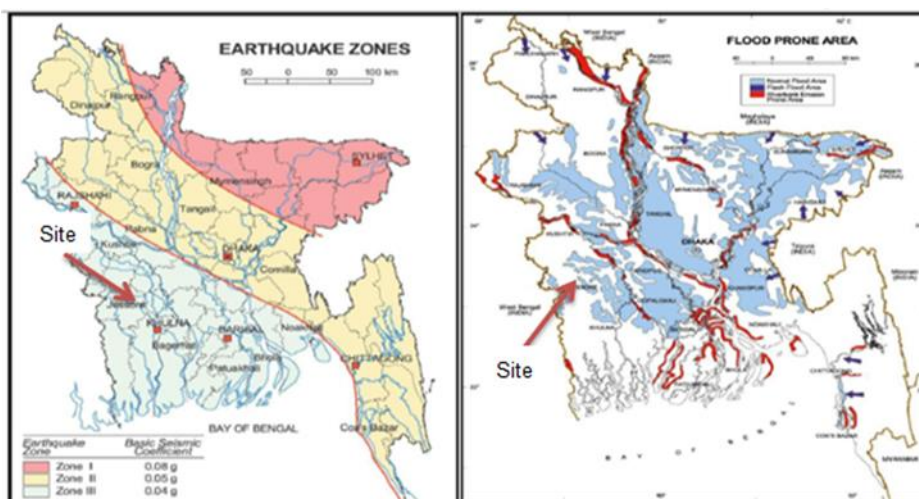
<b>Description</b>	<b>Sources of drinking water</b>
Vice Chancellor's residence	Deep tubewell (installed at the premise); consumes after filtration (commercial filter).
10-storied teacher dormitory	Deep tubewell water (installed in front); consumes with or without after filtration (commercial filter).
5-storied officer dormitory	Deep tubewell water (installed in front); consumes with or without after filtration (commercial filter).
Academic building	<ul style="list-style-type: none"> <li>Centrally supplied water; consumes after filtration (commercial filter)</li> <li>Tubewell water (installed at the back side); consumes directly</li> </ul>
Library cum academic building	<ul style="list-style-type: none"> <li>Centrally supplied water; consumes after filtration (commercial filter)</li> <li>Tubewell water (installed at the west side of administrative building); consumes directly</li> </ul>
Administrative building	<ul style="list-style-type: none"> <li>Centrally supplied water; consumes after filtration (commercial filter).</li> <li>Tube well water (installed at the west side of administrative building); consumes directly</li> </ul>
Medical center cum academic building	<ul style="list-style-type: none"> <li>Centrally supplied water; consumes after filtration (commercial filter)</li> <li>Tube well water (installed at the west side of administrative building); consumes directly</li> </ul>
Sheikh Hasina Girls Hostel	Deep tubewell (installed inside the hall) water supplied separately in every floor; consumes directly
SMR Boys Hostel	Deep tubewell (installed inside the hall) water supplied separately in every floor; consumes directly
Central Mosque	Tubewell (installed in front) water; consumes directly
Central Cafeteria	Tubewell (installed in front) water; consumes directly

#### **4.2.5 Natural Hazards**

**Flooding** The project area is considered low risk to natural disasters like cyclone, flood and

earthquake. However, during intense rainfall in the monsoon season, there is drainage congestion. Flooding that occurred in the Jessore area based on the flood-prone area map is low-river flooding.

**Seismicity** Bangladesh has three seismic zones with moderate and low seismic activity. The area in JUST and around it fall in Zone III category which is considered as low intensity seismic zone. No major earthquake has been reported in the university area in recent years or recent past. Seismic zoning and flood prone areas are shown in Figure 4.6.



**Figure 4.6 Seismic zone and flood-prone areas in Bangladesh**

### 4.3 Biological Environment

JUST campus is rich in plant biodiversity. Around 5,000 plants from 75 different species have been planted within the campus to improve its landscape and to provide shade to students during summer. Table 4.6 gives the list of the plant species.

**Table 4.6 List of plant species within JUST campus**

No.	Name of plant	Scientific name
1	Mango	<i>Mangifera indica</i>
2	Jambul / Berry	<i>Syzygium cumini</i>
3	Jackfruit	<i>Artocarpus heterophyllus</i>
4	Litchi	<i>Litchi chinensis</i>
5	Sapodilla	<i>Manilkara zapota</i>
6	Chinese date	<i>Ziziphus zizyphus</i>
7	Coconut	<i>Cocos nucifera</i>
8	Guavas	<i>Psidium guajava</i>
9	Stone apple	<i>Aegle marmelos</i>
10	Wood apple	<i>Feronia Limonia Swingle</i>
11	Olive	<i>Olea europaea</i>
12	Elephant Apple	<i>Dillenia indica</i>
13	Java apple	<i>Syzygium samarangense</i>
14	Custard-apple	<i>Annona reticulata</i>
15	Orange	<i>Citrus reticulata</i>

No.	Name of plant	Scientific name
16	Apple	<i>Malus domestica</i>
17	Grape	<i>Vitis vinifera</i>
18	Aamla /Gooseberry	<i>Phyllanthus emblica</i>
19	Cherries	<i>Prunus avium</i>
20	Phalsa	<i>Grewia asiatica</i>
21	Tamarind	<i>Tamarindus indica</i>
22	Persimmon	<i>Diospyros kaki</i>
23	Dragon	<i>Hylocereus undatus</i>
24	Pomegranate	<i>Punica granatum</i>
25	Pomelo	<i>Citrus maxima</i>
26	Lemon	<i>Citrus limon</i>
27	Hog Plum	<i>Spondias mombin</i>
28	Nut	<i>Arachis hypogea</i>
29	Hartaki	<i>Terminalia chebula</i>
30	Bahera, Bellirica	<i>Terminalia bellirica</i>
31	Carambola	<i>Averrhoa carambola L.</i>
32	Neem	<i>Azadirachta indica</i>
33	Nishinda	<i>Vitex negundo L.</i>
34	Arjun	<i>Terminalia arjuna</i>
35	Silk cotton	<i>Bombax</i>
36	Rose apple	<i>Syzygium jambos</i>
37	Monkey jack	<i>Artocarpus lakoocha</i>
38	Rambai	<i>Baccaurea motleyana</i>
39	Aloe wood	<i>Aquilaria malaccensis</i>
40	Hing	<i>Ferula assafoetida</i>
41	Malabar leaf/ tejapatta	<i>Cinnamomum tamala</i>
42	Cinnamon	<i>Cinnamomus zeylanicum</i>
43	Mandarin orange	<i>Citrus X sinensis</i>
44	Date palm	<i>Phoenix dactylifera</i>
45	Lucky bamboo	<i>Dracaena braunii</i>
46	Royal poinciana	<i>Delonix regia</i>
47	Dwarf poinciana	<i>Caesalpinia pulcherrima</i>
48	Pride of India	<i>Lagerstroemia speciosa</i>
49	Snowy Orchid-tree	<i>Bauhinia acuminata</i>
50	Night-flowering Jasmine	<i>Nyctanthes arbor-tristis</i>
51	Cherry	<i>Prunus avium</i>
52	Flame of the woods	<i>Ixora coccinea</i>
53	Pin-wheel flower	<i>Tabernaemontana</i>
54	Ashanti blood	<i>Mussaenda</i>
55	Rose	<i>Rosa</i>
56	Oleander	<i>Nerium indicum L.</i>
57	Velvet	<i>Miconia calvenscens</i>
58	Cape jasmine	<i>Gardenia jasminoides</i>
59	Arabian jasmine	<i>Jasminum sambac</i>
60	Shoeblackplant	<i>Hibiscus rosa-sinensis</i>
61	Silver queen	<i>Aglaonema</i>
62	Cannonball tree	<i>Couroupita guianensis</i>
63	Jacaranda	<i>Jacaranda mimosifolia</i>
64	Beli-phul	<i>Jasminum sambac</i>
65	Orange jessamine	<i>Murraya paniculata</i>
66	Night-blooming jasmine	<i>Cestrum nocturnum</i>
67	Allamanda	<i>Allamanda L.</i>

No.	Name of plant	Scientific name
68	Mahogany	<i>Swietenia mahagoni</i>
70	Albizia tree	<i>Albizia lebbeck</i>
71	Shidhu	<i>Dalbergia Sissoo Roxb</i>
72	Panika, Mexican heather	<i>Cuphea hyssopifolia</i>
73	Green coconut	<i>Cocos nucifera</i>
74	Debdaru	<i>Polyalthia longifolia</i>
75	Golden Shower Tree	<i>Cassia fistula</i>

**Homestead and roadside vegetation** Vegetation around the households in the study area consists of mostly commonly cultivated tree species and wild shrubs and herbs. Common planted tree species are raintree (*Albizia saman*), mango (*Mangifera indica*), coconut (*Cocos nucifera*), mahogany (*Swietenia mahagoni*), banana (*Musa sp*), Gogon Siris (*Albizia richardiana*), and Betel palm (*Areca catechu*). Among the weeds are sessile joy weed (*Alternanthera sessilis*), thorny Amaranth (*Amaranthus spinosus*), Bermuda grass (*Cynodon dactylon*), Smartweed (*Polygonum sp*), and creeping oxalis (*Oxalis corniculata*).

#### 4.5 Socio-Economic Environment

The proposed site is located in Jessore district under – Sajjali Mouza, Churamankati Union, Kotwali (Jashore Sadar) Upazilla .

**Population** Jashore Sadar upazilla has 169,164 households, with a total population 742,898 and the male to female ratio is 1.05. Population density of the upazilla is 1,707 persons per square kilometers. The population of Jashore sadar upazilla is growing at a much higher rate compared to the overall growth rate for Jashore district.

**Education** Literacy rate in Jessore Sadar Upazilla is 63.8 percent. Literacy among male population is higher than female (66.8% in male population and 60.6% in female). For ages 5 to 24 years old, 60.2% of the population in the Upazila attend school.

**Poverty** Jashore sadar upazilla has 35.3% incidence of poverty and 16.4% incidence of extreme poverty (BBS, 2010).

**Land Use** The campus is built on 35 acres of land acquired by the government starting from 2006. The campus area is a low-lying agricultural land that used to be cultivated biannually.

**Agriculture** The agricultural land occupies about 20%. According to local people, their produce include rice paddy, jute, potato, onion, pulse and vegetables. Available fruits include mango, jackfruit, etc.

**Housing** About 26% of the households live in pucca house, 35% in semi pucca, 34% in kutchra house and the remaining 5% live in jhupri.

**Sources of drinking water** About 96% of the household population get their drinking water from tube well, 2% from tap and remaining 2% households get water from other sources.

**Sanitation** About 64% of the household population use sanitary latrine, 33% non- sanitary latrine while the remaining 3% have no toilet facilities.

**Access to electricity** All the unions of upazilla (15 nos.) have been brought under the Rural Electrification Program. However, a total of about 75% of the general households reported to have electricity connection in the entire upazilla in 2011 as against about 55% in 2001.

**Physical cultural resources** There are no known sites of historical and archaeological value. Within the study area, there are three mosques, two schools, one medical center located within the premises of JUST.

## 5.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Associated potential environmental impacts will be mainly during the construction phase which are temporary, of short duration, localized and can be easily mitigated through the implementation of the environmental management plan (EMP). Aside from the EMP, the environmental monitoring plan (EMoP) will provide the key elements to be monitored to ensure compliance by the Contractor to the approved building design and relevant regulations on building construction, occupational and environmental health and safety.

### 5.1 Pre-construction and design phase

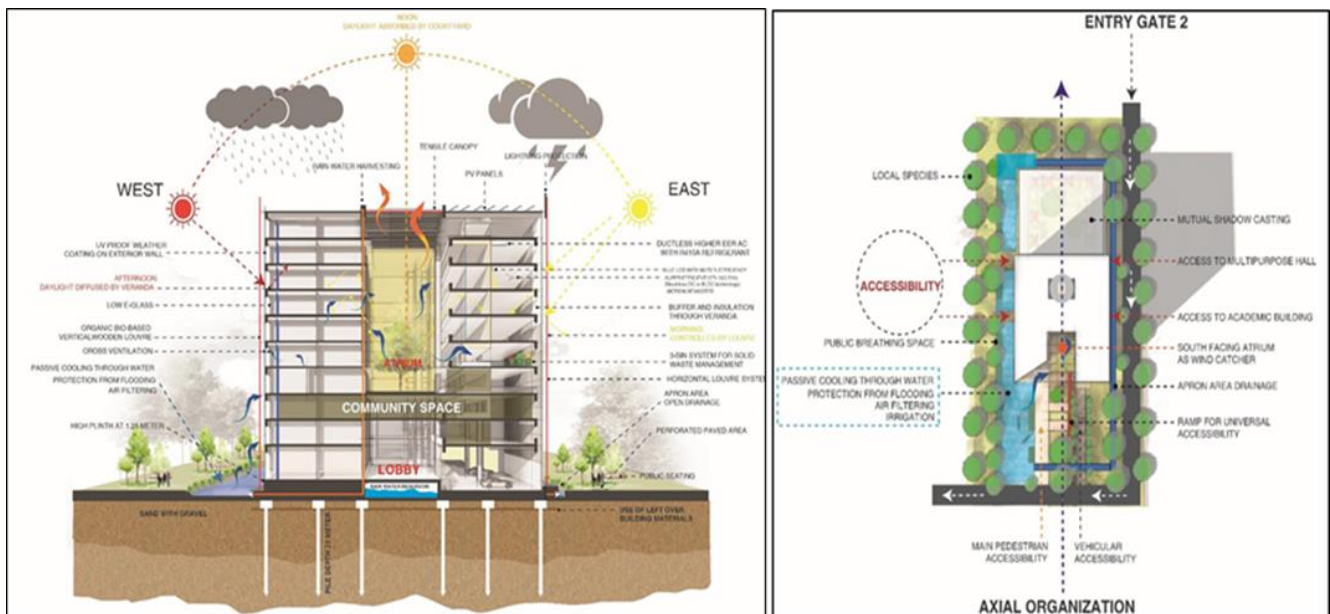
At this stage, activities include preparation of project proposal, design the new building, desktop and ground surveys of the proposed site, preliminary consultations, and drafting of the Development Project Proforma/Proposal. These activities are not expected to have significant environmental impacts as the activities will have minimal physical disturbances to the environment.

Green building features were incorporated in the design of the new building which aims to reduce energy and water consumption, and thus, also expected to be climate change-resilient building. These features are included in the budget with estimated cost of about 10% the total project cost on civil works. Table 5.1 presents a summary of the green building features that will be incorporated in the design of the new building while Figure 5.1 shows the diagrammatic view of all the features as will be applied in the new building.

**Table 5.1 Green building features, new ICT Centre for Excellence**

<b>Green building features</b>	<b>Description</b>
Energy efficiency	<ul style="list-style-type: none"><li>• Use of renewable energy through rooftop solar panels</li><li>• About 20% reduction of power consumption is expected through natural lighting and passive cooling – achieved through innovative massing that use a south-facing internal courtyard covered with a lightweight operable tensile canopy, narrow structural bays, use of buffer and insulated spaces (shading devices, verandas, terraces, screen walls, surface/roof plantations) between indoor spaces and external environment.</li><li>• Use of energy star certified products</li><li>• Use of building materials with ‘low thermal conductivity’ which may include bright reflective U/V proof weather coatings for exterior walls on the south and western part of the building</li></ul>
Temperature	<ul style="list-style-type: none"><li>• Building envelope will be created on the west side using bio-based treated wooden screens, while reflective bright exterior paints will be used for exterior walls while PV cells on roof top will act as insulation from heat gain.</li><li>• Tensile canopy will provide shed from sun but will allow airflow and light – keeping the atrium temperature down.</li></ul>
Rainfall	<ul style="list-style-type: none"><li>• During heavy rainfall, rainwater harvesting from the roof will be directed to the rainwater storage built underneath the ground floor, water retention pond and bio-swales right beside the building will help deal with excess water</li><li>• Design will include maximizing plants and green surfaces in surrounding areas</li></ul>

Green building features	Description
Humidity	<ul style="list-style-type: none"> <li>• Orientation of the atrium to South will ensure ample wind flow to the different spaces of the building, as the atrium would serve as a 'wind catcher' – driving away excess humidity. The narrower structural bays will also help cross ventilation through strategically located windows/openings in each space.</li> <li>• Energy star-certified air conditioning will be provided based on requirements of building users</li> </ul>
Flooding	<ul style="list-style-type: none"> <li>• Building will be designed to have surrounding apron area and an open drainage network that will end up into a water body/bio-swale pond on the South-West corner of the site</li> <li>• In terms of fluvial flooding and possible inundation (predicted flood level for 2050), building's plinth level will be built 1.25 m above present ground level, which according to indigenous sources, has never experienced flooding of any sort in recent past</li> </ul>
Drainage	<ul style="list-style-type: none"> <li>• Capacity of artificial drainage will be calculated based on IDF parameters (intensity, duration and frequency) of rainfall.</li> <li>• Drainage will be provided all around the building – along the building's apron area, while the discharge area is designated to be the waterbody adjacent to the building on its South-West corner</li> </ul>
Cyclone	<ul style="list-style-type: none"> <li>• Jashore is designated as a non-coastal zone according to Bangladesh National Building Code (BNBC) 2015 with not 'real' cyclone vulnerability but for additional precaution, structural design will consider a maximum wind load of 230 km/hour</li> <li>• To withstand cyclonic wind loads, anchoring and proper bolting of all cladded building materials including rooftop PV panels and exterior wall screens will be undertaken.</li> </ul>
Earthquake	<ul style="list-style-type: none"> <li>• Seismic zoning and seismic requirements based on BNBC 2015 will be considered</li> <li>• From subsoil investigation, deep foundation system with precast pile down to 21 m-depth, has been considered in the designed</li> </ul>



Sectional (left) and planar (right) representations of JUST IT building with indications about green building standards, considerations and features

### **Figure 5.1 Diagrammatic view of green building features**

Aside from incorporating green building features, relevant provisions set forth in BNBC 2006 and BNBC 2015 (draft) will be adhered to in the design and construction.

## **5.2 Construction phase**

This phase will involve the recruitment of workers and staff, mobilization of contractors, equipment and machineries, site preparation, delivery and storage of construction materials; civil, mechanical, and electrical works; landscaping and clean-up of construction debris, and occupancy of the new building.

Prior to construction works, the PMU in UGC and the PIU in JUST will ensure that the Contractor will include the responsibility of compensating for any temporary damage, loss or inconvenience as a result of accident or failure to comply with regulations in implementing the project. The Contractor will be required to conduct baseline environmental quality measurements for air, noise, and source of drinking water to be provided to construction workers before start of construction.

Environmental Codes of Practice (ECoP) relevant during construction phase are given in Appendix 1. ECoPs are general non-site specific guidance from best construction practices that be implemented for this project to ensure that potential associated construction environmental impacts will be minimized. Contractors will be required to refer to these ECoPs as well as comply to the EMP.

### **5.2.1 Prepare construction management plan**

Before any construction works, the Contractor will be required to prepare a construction management plan to guide the implementation of earth-moving works, construction of the building, civil, mechanical, and electrical works including restoration of the site and the existing access roads. The plan will cover work scheduling, occupational and community health and safety, temporary pedestrian and traffic management, spoils disposal and construction waste, noise and dust control, drainage and stormwater management, materials storage and management, protocol in dealing with students, occupants of staff housing and administrative staff of JUST, and emergency/disaster preparedness. Critical information to know during emergency will be included in an emergency kit such as evacuation or assembly point, what they need to do and what they should not do. Emergency contact details will be posted in billboards clearly at the construction site.

### **5.2.2 Hiring of staff and workers**

There will be potential job opportunities for both skilled and unskilled workers during construction phase. These opportunities, however, may cause conflict over lack of transparency in recruitment. Hiring of local labour will be given priority. The Contractor will be required to comply with the relevant provisions in the Bangladesh Labour Act 2006 (amended 2013) and Bangladesh Labor Rules 2015 on recruitment and working conditions.

Due to construction works, there will be workers present within the premises of JUST particularly in the construction site. The Contractor will be required to ensure that their workers will strictly observe the rules and regulations of JUST including occupational health and safety rules that will be imposed on them by the Contractor.



### **5.2.3 Orientation of workers and staff**

Before any construction works begin, the PIU in JUST and PMU together with the environmental safeguard consultant will conduct an orientation to the workers and staff of Contractor on occupational health and safety, applicable rules and regulations of JUST as well as environmental requirements of GOB and ADB. The orientation aims to create awareness on their responsibility for implementing and compliance to the EMP, effective record keeping, and environmental reporting. The orientation will also include awareness on communicable disease like tuberculosis and about HIV/AIDS to prevent potential incidence in the workplace.

The Contractor will be required to designate an Emergency and Disaster Coordinator to guide the workers in case of an emergency or disaster. Workers will be informed that mock drills will be conducted regularly and participation will be mandatory. The Contractor will be required also to invite resource persons from relevant government agency or private sector to conduct training on proper emergency response at least once a year throughout construction phase.

### **5.2.4 Site preparation and construction works**

The Contractor will coordinate with respective government agencies before any site preparation to determine the connections of utilities such as natural gas pipeline, water pipes, sewers, and other services that may be affected.

If the Contractor decides to operate quarry to meet the requirements of the construction works, the necessary permits and clearances from relevant agencies of the government should have been obtained prior start of operation. The Contractor need to ensure that the quarry providing materials to the construction of the new ICT building is maintained in stable condition, appropriately and adequately landscaped, and when taken from the river, it should not disrupt the flow of river or damage the river banks causing erosion. Bhairab River is located about 3 km east from the site. The stockyard and construction site will be temporarily and properly enclosed with designated security personnel to prevent entry of unauthorized persons.

The area within the premises of JUST is not known to have sites of archeological and historical value. Nonetheless, ECoP 1.0 provide measures in case of encounter with physical cultural resource.<sup>8</sup>

### **Impacts on air quality**

Site preparation will involve land and minimal vegetation clearing. Potential increase in dust level may be expected as a result of these activities. This impact may cause inconvenience to the occupants of the VC residence and may be experienced up to the staff housing/dormitory. To contain the potential increase in generation of dust, the Contractor will be required to do the following:

- Provide temporary fencing and enclosures of the construction site (at least 2 m-high);

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<sup>8</sup> PCR as defined in SPS 2009 are movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings and may be above or below ground or under water. Their cultural interest may be at the local, provincial, national, or international level.

- Spray water to any opened area and work sites, as and when needed particularly during the summer season;
- All excavated soil and stockyard will be covered with tarpaulin or other appropriate cover material during non-working time, and excess soil will be removed from the worksite to the designated disposal site;
- Provide a space onsite to accommodate the required materials so that transport and delivery of construction materials will be minimized including vehicular emissions;
- Alternate access route to the site will be used (see Figure 5.2) to minimize safety risks to the university students, faculty members, and other people using the main roads of the university;
- Provide workers assigned to dusty areas with safety masks or goggles;
- Vehicles that will deliver construction materials to the site that generate dust will be covered with suitable material to contain dust;
- Regularly maintain construction vehicles, generators (if required), and heavy equipment to avoid smoke belching;
- Prohibit burning of garbage, liquid waste and other combustible materials within the construction site; and,
- ECoP 2.0 presents some measures on managing quality.



**Figure 5.2 Alternate access route to site**

The PIU will ensure that ambient air quality limits set by the IFC-WB EHS General Guidelines 2007 and GOB will not be exceeded during construction phase. GOB ambient air quality limits (2005) are less stringent compared to the IFC-WB EHS General Guidelines 2007. SPS 2009 requires that should host country regulations differ from the levels and measures set by the IFC-WB EHS General Guidelines 2007, the host country will achieve whichever is more stringent. In this case, the IFC-WB EHS General Guidelines 2007 will be the relevant limits that the Contractor needs to comply.

### **Impacts on noise**

The major sources of noise generation are movement of construction vehicles, associated land clearing, and from the construction of the new building . These activities, together with daily university activities, in some occasions, may exceed the limits provided for in the Noise (Pollution) Control Rules 2006. This intermittent increase in noise levels will be temporary, of short duration and can be mitigated.

Exposure of workers to increased noise levels is an occupational as well as a public health hazard. Table 5.2 presents the typical noise levels of tools and equipment. As a comparison, Table 5.3 presents the common sources of noise and decibel levels that people are generally exposed to. In order to mitigate the temporary negative impact on noise, the Contractor will be required to:

- Orient, prior to construction works, and inform workers about noise level requirements;
- Provide workers assigned to high-level noise-generating activities with personal protective equipment such as ear muffs and earplugs and will be rotated every two hours;
- Undertake activities that generate noise during daytime only (but will be adjusted contingent to weather and season);
- Require drivers of construction vehicles to observe low speed and blowing of horns or whistle will not be allowed unless absolutely necessary;
- Assign staff to maintain the flow of traffic to avoid inconvenience to students, faculty members and administrative staff;
- Require regular tune-up of construction vehicles and proper maintenance of machinery; and,
- ECoP 3.0 gives some measures on managing noise and vibration.

**Table 5.2 Typical Noise Levels of Tools and Equipment**

Equipment	Noise Level, dB(A)
Cranes	78 - 103
Backhoes	85 - 104
Loaders	77 - 106
Dozers	86 – 106
Scrapers	97 - 112
Trenchers	95 - 99
Pile drivers	119 - 125
Compactors	90 – 112
Grinders	106 -110
Chainsaws	100 - 115
Concrete saw	97 – 103
Sandblasting nozzle	111 - 117
Jackhammers	100 - 115
Compressors	85 – 104
Note: These noise levels are measured at the operator's position.	

Source: Infrastructure Health & Safety Association, Chapter 14, Hearing Protection, Table 14-4.  
<http://www.ihsa.ca/About.aspx>

**Table 5.3 Common Sources of Noise and Decibel Levels**

Everyday Sounds and Noises	Average Sound Level (dBA)	Typical Response (after routine or repeated exposure)
Softest sound that can be heard	0	Sounds at these dB levels typically don't cause any hearing damage.
Normal breathing	10	
Ticking watch	20	
Soft whisper, quiet library	30	
Refrigerator hum	40	

Everyday Sounds and Noises	Average Sound Level (dBA)	Typical Response (after routine or repeated exposure)
Moderate rainfall	50	
Normal conversation, air conditioner	60	
Washing machine, dishwasher	70	
City traffic (inside the car)	80–85	You may feel very annoyed
Gas-powered lawnmowers and leaf blowers	80-85	Damage to hearing possible after 2 hours of exposure
Subway, passing motorcycle, gas mower	91	Dangerous to hearing; wear earplugs or earmuffs
Hair dryer, kitchen blender, food processor	94	Dangerous to hearing; wear earplugs or earmuffs
Motorcycle	95	Damage to hearing possible after about 50 minutes of exposure
Approaching subway train, car horn at 16 feet (5 meters), and sporting events (such as hockey playoffs and football games)	100	Hearing loss possible after 15 minutes
The maximum volume level for personal listening devices; a very loud radio, stereo, or television; and loud entertainment venues (such as nightclubs, bars, and rock concerts)	105–110	Hearing loss possible in less than 5 minutes
Shouting or barking in the ear	110	Hearing loss possible in less than 2 minutes
Standing beside or near sirens	120	Pain and ear injury
Jet plane takeoff, siren, pneumatic drill	120	Not safe for any period of time
Jackhammer	130	Not safe for any period of time
Firecrackers	140–150	Pain and ear injury

Sources:

1. US Department of Health & Human Services. Centers for Disease Control and Prevention. Centers What Noises Cause Hearing Loss? [https://www.cdc.gov/nceh/hearing\\_loss/what\\_noises\\_cause\\_hearing\\_loss.html](https://www.cdc.gov/nceh/hearing_loss/what_noises_cause_hearing_loss.html).
2. American Speech-Language-Hearing Association. Loud Noise Dangers. <https://www.asha.org/public/hearing/Loud-Noise-Dangers/#signs>.

## Generation of waste

There is no available data on the volume of solid waste generated at JUST. Based on an undergraduate thesis in 2017, solid waste management in JUST is done in three methods: (i) recyclable wastes like papers, reports, PET bottles, metals, glass, e-waste, household items, etc. are being sold or donated to hawkers and they take or haul the waste out of the campus, (ii) printed materials with confidential information and those not recyclables (e.g., office files and letters, reports, exam scripts, etc.) are being burnt at the campus, and (iii) non-recyclable household waste (e.g., kitchen waste from the dormitories and hostels, etc.), building scrap and waste from sweeping and yard trimmings are being deposited either into the temporary waste collection bins next to the 10-story teacher dormitory (see Figure 5.3) or earth filling site next to the girl's hostel. Once the temporary waste bins are full, municipal waste carrier vehicles are hired to transfer the wastes to the Jashore Municipal waste dumping site or in the Integrated Landfill and Resource Recovery Center.



**Figure 5.3 Temporary Waste Collection Area**

Construction works are expected to generate waste such as spoils, construction materials, wood, cleared vegetation, waste food, cement container, and other similar debris. If not managed properly, this waste will be unsightly and may pose health and safety risks to workers and the community within JUST. To mitigate this impact, the Contractor will be expected to implement the following measures:

- Implement the waste management plan which is part of the overall Construction Management Plan submitted to PIU before the start of construction;
- Provide adequate garbage bins and will require workers to separate waste for easier collection and management (i.e., residual oil and lubricants, paints, thinners will not be mixed with other waste);
- Observe good housekeeping at the construction site at all times and monitor compliance;
- Burning of solid waste at the construction site will not be allowed at any time; and,
- ECoP 4.0 presents additional measures on waste management.

### **Impacts on people**

Associated works during site preparation and construction of the new building may pose health and safety risks to workers and community. This could be working on heights and constrained spaces. Non-compliance to relevant regulations on codes and standards on civil, mechanical and electrical works may also trigger accidents to workers. Given the site, construction camps will not be located within JUST premises. To minimize the occupational and community health and safety risks, the Contractor will be required to implement the following measures:

*Occupational health and safety risks* To prevent accidents, provide workers and staff with appropriate PPE and safety clothes such as hard hats, steel-toed boots, ear muffs/plugs, etc., and will train and/or orient workers on safe building construction practices and other issues on safety. Wearing of safety gears will be mandatory and the statutory age requirements for employment as provided for in Bangladesh Labour Act 2013 will be strictly enforced. Consider to provide group insurance to construction workers for accidents resulting to disabilities or death.

Sanitary facilities and safe drinking water will be provided to the workers and appropriate scaffoldings will be installed. Clear and visible warning signs and lighting will be installed. In case of medical emergency, first aid kits will be provided at the construction sites. JUST medical center can provide medical support, if required. The medical centre is within the 1<sup>st</sup> floor and 2<sup>nd</sup> floor of

an academic building, 25-bed capacity, equipped with an ambulance, three medical officers (one night shift and three daytime shift), and a pharmacy model (see Figure 5.4). Fire-fighting equipment will be provided onsite.

At the start of each day, toolbox meetings that last for a few minutes will be held to remind workers of the importance of compliance to safety rules and procedures.

*Community safety risks* Prior to start of construction works, conduct awareness orientation and/or briefing about safety to key stakeholders in JUST (i.e., faculty staying in housing/dormitory, students, etc.). Inform PIU and key stakeholders (if required) on the schedule of construction activities that may pose risks to public safety. Proper fencing and enclosure (at least 2 m-high) will be installed at the site to prevent unauthorized access. Security personnel will be posted to discourage pilferage and vandalism.

Set boundary line between construction site and areas accessible to JUST community. Provide proper identification of workers and staff at the construction site. Clear and visible warning and danger signs at and around the site will be installed. ECoP 5.0 gives additional measures on occupational health and community safety.



**Figure 5.4 Medical Centre (1<sup>st</sup> floor and 2<sup>nd</sup> floor)**

#### **5.2.5 Completion of construction works**

Improper clean-up and disposal of construction debris may cause safety and health risks; and reduced aesthetics value. To ensure clean-up and restoration of construction sites, the Contractor will be required to restore/reinstate all the areas potentially damaged during construction works. Workers that may be assigned to clean-up and restoration works will be provided with proper safety gear and equipment.

### **5.3 Post-construction phase**



Upon completion of construction phase, the potential impacts will be mainly beneficial since the students, faculty members, and academic staff of the CSE Department will now have a new and fully furnished ICT building. At this stage, they will enjoy the comfort of a new building.

### 5.3.1 Occupancy of the new building

Occupancy of the new building may give rise to improper use and lack of care, and inadequate maintenance. Absence of proper building management plan may lead to premature wear and tear. The use of the new building may result to generation of waste from occupants.

To mitigate these potential impacts, JUST Management through the CSE Department will prepare building maintenance and management plan which will include management of waste. The Chief Engineering Section will designate a waste management coordinator. The CSE Department can consult the Department of Environmental Science and Technology in developing a building waste management program which will incorporate the principles of reduce, reuse, and recycle.

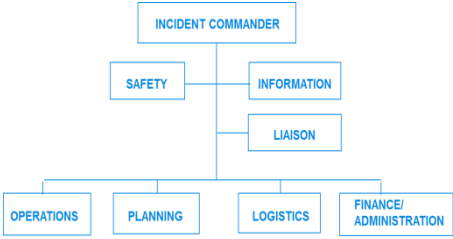
The CSE Department will conduct yearly orientation and briefing to staff, students and other building users on the proper management and care of the new ICT building.

### 5.3.2 Emergency response plan

Fire-fighting systems will be strategically located in the new building. There is a security team to ensure safety and security of all building users. As part of emergency preparedness, a draft emergency response plan (ERP) will be finalized in consultation with students, faculty, and administrative staff. Table 5.3 presents the key elements of the draft ERP.

**Table 5.3 Key Elements of ERP (Draft)**

<b>Elements</b>	<b>Description</b>
Approach	The aim of this emergency response plan is to guide personnel in an accident or emergency situation to prevent or minimize injury, damage and material loss and also to prevent or mitigate environmental impact from the accident or emergency.
Types of emergency	<ul style="list-style-type: none"> <li>• Earthquakes</li> <li>• Cyclones</li> <li>• Energy/utility outages</li> <li>• Fire hazards</li> <li>• Hazardous materials releases</li> <li>• Terrorism</li> </ul>
Planning	<ul style="list-style-type: none"> <li>• Identify hazards and assess risk</li> <li>• Assess capabilities and resources</li> <li>• Develop an emergency plan and procedures</li> <li>• Conduct training</li> <li>• Public relations</li> <li>• Conduct drills and exercises</li> <li>• Develop audit procedures</li> </ul>
Emergency preparedness requirements	<ul style="list-style-type: none"> <li>• Identified assembly points and/or evacuation points</li> <li>• A well-defined escape routes</li> <li>• Fire-fighting system will be supplied in strategic locations</li> </ul>

Elements	Description
	<ul style="list-style-type: none"> <li>• Proper security arrangements functioning at all times</li> <li>• Efficient transport and communications system</li> <li>• Smoking will be prohibited within areas with flammable substances (if any)</li> <li>• Water will be kept available for fire-fighting</li> <li>• Availability of sufficient number of trained staff to deal with any emergency situation</li> <li>• Clear and audible emergency alarm/whistles and public address system</li> <li>• Conduct drills to familiarize students, faculty, and administrative on the evacuation routes and use of the fire-fighting system</li> <li>• Emergency contact number of the medical centre (and nearest hospital), ambulance and fire service and police station)</li> <li>• Main electrical equipment is switched off when not in use</li> </ul>
Incident command system	 <pre> graph TD     IC[INCIDENT COMMANDER] --- S[SAFETY]     IC --- I[INFORMATION]     I --- L[LIAISON]     IC --- O[OPERATIONS]     IC --- P[PLANNING]     IC --- LOG[LOGISTICS]     IC --- FA[FINANCE/ADMINISTRATION] </pre>



## 6.0 ANALYSIS OF ALTERNATIVES

Given the limited space within the government-owned area in JUST, there were no alternatives considered that may require land acquisition. However, a “no project” option was considered and compared with “with project” option.

### 6.1 “No project” option

The “no project” option will mean that the open green space within JUST will not have its best and highest usage of land. In addition, the undergraduate and graduate students, faculty and staff of CSE Department will not have the opportunity to benefit from innovative IT learning environment that the new building will provide. Table 6.1 presents a comparison of “no project” option and “with project” option.

**Table 6.1 Comparison of “with project” and “no project” options**

<b>Description</b>	<b>“With Project” Option</b>	<b>“No Project” Option</b>
Producing students equipped with state-of-the-art training and education fit to the requirements of the IT industry	There will be demand for IT graduates to meet the requirements of the IT industry	Limited or no possibility of producing better graduates due to poor IT facilities
Inconvenience and disruption to daily activities during construction	There will be temporary disruption to JUST community	Potential traffic congestion may also occur due to increased population and vehicle owners
Ecological impacts	Site has some small trees as part of JUST landscaping that will be cleared. These can be replaced or replanted.	Existing environmental condition will be the same
Creation of temporary employment	There will be temporary jobs for skilled and non-skilled workers during construction	No temporary jobs will be created
Opportunities for students to have more options for IT training	There will be more options for R & D, training, and link to the private sector expected to improve chances of employability	No opportunities
Contribution to Vision 2021	Will contribute to the goals and objectives	No contribution

## 7.0 INFORMATION DISCLOSURE, CONSULTATION, AND PARTICIPATION

### 7.1 Introduction

Consultations aim to engage key stakeholders throughout the project implementation and to know their concerns and perceptions, if any about the project. These events give the opportunities for the public to share their views to JUST about the proposed construction of the new multi-storied ICT building and also for JUST to present to the stakeholders relevant information on the project. Consultation will not be limited during the preparation of IEE but will be carried out during project implementation.

### 7.2 Methodology

**Identification of stakeholders** Stakeholders are considered to be primary if they will be directly affected during construction and post-construction such as students, faculty members, administrative staff, and support services staff. Secondary stakeholders are persons, organizations, or businesses that may not be directly affected but may have interests on the project such as relevant government agencies, NGOs, transport cooperatives and the general public. Stakeholders were invited by JUST project team focal person through phone calls, letter, and visit in person.

**Approach** Participants were informed of the proposed project and the potential environmental impacts due to the project. After the presentations, participants were given the time for questions and answers to raise their concerns. Discussions were done in Bangla and English.

**Record of the meeting** General information of the participants such as name, gender, occupation, and signature were collected and shown in the attendance list.

### 7.3 Results of consultation

A total of 16 participants (five females and 11 males) joined the consultation meeting on 1 April 2019 at the Conference Room of the Vice Chancellor in the Administrative Building. Participants include: some residents from the staff housing within JUST premises, representative from the central mosque, representative from the student council, Chief Engineer and the Executive Engineer of the Engineering Section; Chair of CSE, faculty members from different departments, and the students from the CSE Department.

The focal person from the CSE Department made a presentation about the project (Outputs 1-4) and details on the proposed new ICT building. The consultants briefly discussed the requirements for environmental due diligence and measures to be implemented to ensure that the temporary adverse impacts of construction will be mitigated including the grievance redress mechanism. Appendix 2 presents the list of participants and photographs. Table 7.1 presents the summary of consultation.

**Table 7.1 Summary of consultation**

Issues Raised	Response from Project Team
Potential noise and air pollution during construction of the new building	Measures to minimize generation of dust and noise will be required from the Contractor and will be included in the environmental management plan.

Issues Raised	Response from Project Team
Access to the building of persons with disability on mobility and vision (i. e., wheelchair; introducing ramp/elevator)	Design of the building will include access of persons with disability and will explore incorporating features to help persons with impaired vision
Contractor's behavior and access for construction materials	Contractor will use alternate access to avoid disruption to students (the gate which is used presently by Vice Chancellor) passes through the Churamonkathi-Chaugacha road (refer to Figure 5.2)
Waste management at the university premises	<p>For solid waste management during operation phase, will provide bins in different color to separate biodegradable and non-biodegradable wastes in every floor of the building.</p> <p>JUST authority plans in future to establish MOU agreement with Jashore Pourashava for using their landfill area for disposal of wastes.</p>
Emergency response preparedness	<p>Identification of an emergency evacuation point in the building and placing emergency alarm system in the building to warn the student population of any such situations.</p> <p>Regular emergency training and awareness program will be provided by Chief Engineer's Office</p>

#### 7.4 Consultations and information during implementation

Consultations with students, faculty, and administrative staff will continue. This could be on construction practices, building management and emergency preparedness. To meet disclosure requirements of ADB, project brief (both in Bangla and English) will be posted in the website of JUST. A one-page project brief (also both in English and Bangla) will be made available to interested individuals in JUST and UGC. The one-page flyer or Q&A will include details on the grievance redress mechanism. The IEE which will be posted to ADB website will provide more information on the project.

## 8.0 GRIEVANCE REDRESS MECHANISM

To ensure that complaint(s) will be addressed properly during project implementation the PMU, through the PIU, will establish a grievance redress mechanism (GRM) as soon as the ADB loan becomes effective. The GRM is a process of handling complaints from affected people on the environmental performance of the project, in reviewing, and in facilitating the resolution.

*Objectives of GRM* This ensures a process of receiving and resolving complaint(s) promptly from persons that may be affected by the new ICT building. Following the requirements of SPS 2009, the GRM will involve a process that is understandable, transparent, gender-responsive, culturally-appropriate, and easily accessible to affected persons without cost and retribution.

*Structure* A grievance redress committee (GRC) will be created and may consist of: (1) PMU Head, (2) representative from the local government, (3) representative of Contractor, and (4) witness of the complainant. The environmental safeguard consultant at the PMU will act as the secretary of the GRC. Ideally, the GRC will continue to function from construction until post-construction. However, given the nature of the project, where environmental issues may be of concern during construction phase, the GRC may be inactive post-construction. MOE and UGC will ensure the representation of women in GRC.

GRC will be responsible for resolving complaint(s) and will convene once a month to review the complaint(s) received, if any. GRC will resolve complaint(s) within 15 days from the date of receipt and will keep a record indicating the name of complainant and nature of complaint, status of resolving the complaint, decisions or actions undertaken, and the date the decision was effected.

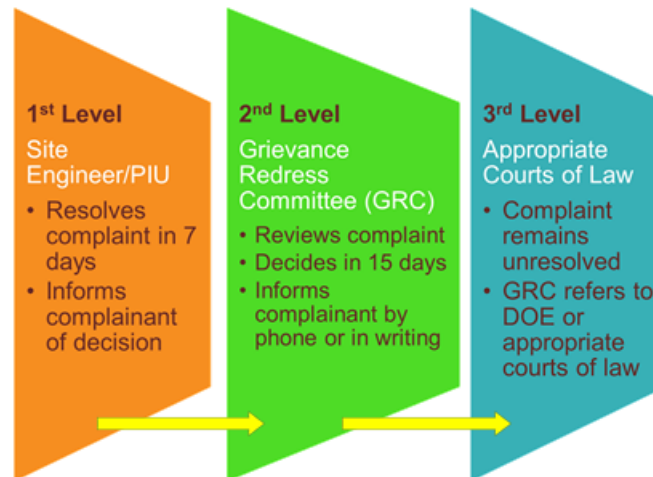
The PMU will review the implementation of the GRM regularly to assess the effectiveness of the process and to examine their ability to address grievances. Cost of implementing the GRM will be part of the administration cost borne by the PMU.

*Information disclosure* PIU will disclose details on GRM through the project website of JUST as well as in the billboards at the construction site. Details will include the contact person, a hotline phone number, and a simplified flowchart on how to file a complaint.

*Record-keeping* A record of all complaints received including contact details of the complainant, date the complaint was received, nature of grievance, decisions and date, and date the complainant was informed of the decision. Grievances filed and resolved will be summarized and included in the semi-annual monitoring reports submitted to ADB during construction stage and annually during post-construction/operation stage.

*Procedure* Complaint can be lodged either by approaching the Site Engineer of the Contractor, in writing or by phone. A complaint form is given in Appendix 3. Transparency will be maintained on the grievances received and their resolution. The environmental safeguard consultant will provide support to the complainant in filing the complaint. Affected persons can seek redress to their complaints in three levels (see Figure 8.1): (i) through the PIU or through the Site Engineer of the Contractor, (ii) through the GRC, and (iii) the DOE under provisions set forth by the Environment Court Act 2000 (amended in 2002 and 2010) or the appropriate courts of law. The complainant is not restricted to seek redress through the legal system at any point in the GRM process. The three-tier entry points include:

- (i) *First level – Contractor Site Engineer/PIU Head* Complaint to be resolved at the PIU level within seven days and advise the Complainant accordingly.
- (ii) *Second level - GRC* If complaint is not resolved at the first level, the Complainant can submit the complaint to the GRC chaired by the PMU Head. The GRC will review the submission and make a decision within 15 days. The Complainant will be informed of the decision in person, by mail or by phone.
- (iii) *Third level – Appropriate Courts of Law* If the complaint remains unresolved, this will be referred by the GRC to the DOE or the appropriate courts of law.



**Figure 8.1 Three-tier grievance redress mechanism**

## 9.0. ENVIRONMENTAL MANAGEMENT PLAN

The summary of impacts and measures that will be conducted to mitigate the adverse impacts are presented in the environmental management plan (EMP). The EMP covers the monitoring plan and the institutional arrangements required. Table 9.1 presents the EMP.

### 9.1 Monitoring

The environmental monitoring is a time-bound process to ensure that non-compliance of the Contractor will be avoided or will be immediately addressed. Environmental monitoring reports will be submitted to ADB twice a year during construction and annually post-construction. The environmental monitoring reports submitted to ADB will be publicly disclosed in their website as required by SPS 2009 and Access to Information Policy. Table 9.2 presents the environmental monitoring plan (EMoP).

### 9.2 Implementation Arrangements

*Project management unit (PMU)* PMU will be set-up at UGC who will be responsible for the overall management of the project. Supported by an environmental safeguard consultant, the PMU will be also responsible in ensuring that the EMP and EMoP are properly implemented and complied with by the Contractor, submission of environmental monitoring report to ADB, and in handling complaints following the GRM. The terms-of reference of the environmental safeguard consultant for the PMU is given in Appendix 4.

*Project implementation unit (PIU)* JUST will set-up a PIU who will be responsible for managing the project. The PIU will ensure that the EMP and EMoP are properly implemented, timely reporting to PMU of the environmental monitoring report required by ADB (see Appendix 5 and Appendix 6 for proposed format), public consultations (as appropriate), and in handling of complaints according to the GRM. Key responsibilities of PIU are as follows:

- Designate a staff to oversee implementation of EMP and EMoP;
- Ensure compliance of contractor to EMP and EMoP;
- Engage stakeholders, as appropriate;
- Conduct onsite spot-checks to monitor compliance of contractor (see Environmental Inspection and Monitoring Checklist in Appendix 7);
- In the event of non-compliance by Contractor or any unanticipated environmental impacts, coordinate with the PMU environmental safeguard consultant in preparing a corrective action plan (CAP) to address the issue with time-bound actions; CAP will be submitted to ADB for review and will be disclosed to ADB website;
- Ensure that any grievance/complaint received are addressed in a timely manner;
- Maintain a record of grievance/complaint received, resolution or action taken, and include the details in the environmental monitoring report;
- Keep a list of relevant permits issued by the GOB for the project, if any; and,
- Prepare the respective environmental monitoring report and submit to the PMU for consolidation and finalization by the environmental safeguard consultant.

In the event there will be a change in the design of the new ICT Centre for Excellence building, this IEE will be updated/revised and submitted ADB prior to any construction works. The updated/revised IEE will be also disclosed to ADB website.

*Contractor of civil works* The EMP which includes the EMoP will be an integral part of the Bid and Contract documents. This will be verified by the PIU and the PMU. The contractor will designate their environmental staff who will be responsible in overseeing the implementation and compliance to EMP and EMoP during construction phase. Maintain a record of complaint/grievance submitted at the project level through the contractor including the action taken to address the issue.

The designated environmental staff will submit a monthly compliance and monitoring report to the PIU-designated environmental staff. The compliance and monitoring report will cover the EMP, EMoP, and the specific environmental clause(s) in their contract.

**Table 9.1 Environmental Management Plan**

Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Estimated Cost	Implementing Unit	Supervising and Monitoring Unit
<b>Design and Pre-Construction Stage</b>					
Site survey and design of the new building	<ul style="list-style-type: none"> <li>• Failure of the building to withstand climate change and natural hazards</li> <li>• Potential safety and health risks to students and building users due to poor building design</li> </ul>	<ul style="list-style-type: none"> <li>• Green building features were incorporated</li> <li>• Design will comply with the requirements of BNBC 2006 and relevant provisions in the BNBC 2015 (draft)</li> </ul>	Included in project cost	PIU, Design consultant	PMU and Environmental Safeguard consultant
	<ul style="list-style-type: none"> <li>• Lack of technical capacity on safeguards at JUST</li> </ul>	<ul style="list-style-type: none"> <li>• PIU will designate staff to coordinate with the environmental safeguard consultant in PMU</li> <li>• PIU team will undergo orientation training on the safeguards requirements and compliance under SPS 2009</li> <li>• PIU may consider engaging intermittent consultant on safeguards</li> </ul>	PIU Budget	PIU, Environmental Safeguard consultant	PMU and ADB
<b>Construction Stage</b>					
Complete construction management work plan	<ul style="list-style-type: none"> <li>• Avoid impacts of Contractor unplanned activities</li> <li>• Smooth work implementation</li> </ul>	<ul style="list-style-type: none"> <li>• Temporary pedestrian and traffic management plan to minimize disturbance from vehicular traffic and workers</li> </ul>	Included in the project cost	Contractor, PIU	PMU, Environmental Safeguard consultant
		<ul style="list-style-type: none"> <li>• Spoils disposal and construction waste management plan</li> </ul>			
		<ul style="list-style-type: none"> <li>• Noise and dust control plan</li> </ul>			
		<ul style="list-style-type: none"> <li>• Drainage and stormwater management plan</li> </ul>			
		<ul style="list-style-type: none"> <li>• Materials management plan</li> </ul>			
		<ul style="list-style-type: none"> <li>• Emergency/disaster preparedness plan</li> <li>• Provide list of contact details during emergency to workers or post in billboards at construction site</li> </ul>			



Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Estimated Cost	Implementing Unit	Supervising and Monitoring Unit
Orientation of workers and staff	<ul style="list-style-type: none"> <li>• Awareness to environmental requirements and their responsibility</li> <li>• Understanding the responsibility of Contractor in implementing the EMP, compliance to ADB requirements and the government</li> <li>• Provide HIV-AIDS education and disease prevention awareness talks to the workers and staff</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct briefing on EMP, records management, compliance and reporting</li> <li>• Identify areas to be monitored and the required mitigation measures</li> <li>• Create awareness of sexually-transmitted diseases such as HIV/AIDs</li> </ul>	Included in the Contractor cost	PIU, Environmental Safeguard consultant	PMU
Prepare for emergency situation	<ul style="list-style-type: none"> <li>• Create awareness of workers on emergency situation</li> </ul>	<ul style="list-style-type: none"> <li>• Designate Disaster Coordinator to guide during emergency</li> <li>• Conduct mock drills regularly</li> <li>• Provide information like emergency hotline, evacuation routes, etc.</li> <li>• Provide training or orientation on proper response during emergency</li> </ul>	---	Contractor, PIU	PMU, Environmental Safeguard Consultant
Hiring of project staff and workers	<ul style="list-style-type: none"> <li>• Dispute over transparency in hiring</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor will be required to give priority to local labour</li> </ul>	---	Contractor, PIU	PMU, Environmental Safeguard consultant
<ul style="list-style-type: none"> <li>• Site preparation and construction works</li> </ul>	<ul style="list-style-type: none"> <li>• Disturbance and inconvenience to people due to traffic, increased noise and dust levels, and disposal of waste</li> <li>• Emissions from heavy equipment machinery and construction vehicles</li> </ul>	<ul style="list-style-type: none"> <li>• CMP will be strictly implemented</li> <li>• Use of proper safety clothes/equipment</li> <li>• Provide temporary enclosures (at least 2 m-high) to contain dust and minimize noise</li> </ul>	Included in the costs of Contractor	Contractor, PIU	PMU, Environmental Safeguard consultant
	<ul style="list-style-type: none"> <li>• Potential chance find during site excavation</li> </ul>	<ul style="list-style-type: none"> <li>• Chance find procedures in ECoP 1.0 will be followed</li> </ul>			Environmental Safeguard consultant
	<ul style="list-style-type: none"> <li>• Potential safety risks to community</li> </ul>	<ul style="list-style-type: none"> <li>• Provide fence or barricade, sufficient lights, clear warning signs and danger signals, and take all precautions identified in the community and safety plan of CMP</li> <li>• Assign security staff prevent accidents, trespassing, and pilferage</li> </ul>			PMU, Environmental Safeguard consultant

Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Estimated Cost	Implementing Unit	Supervising and Monitoring Unit
		<ul style="list-style-type: none"> <li>Contractor to direct drivers to strictly follow road regulations</li> </ul>			
	<ul style="list-style-type: none"> <li>Potential occupational health and safety risks to workers</li> </ul>	<ul style="list-style-type: none"> <li>Provide workers with hard hat, safety shoes and belts</li> <li>Set up first aid at construction site</li> <li>Comply with relevant safety measures required by law and best engineering practices</li> </ul>			PMU, Environmental Safeguard consultant
	<ul style="list-style-type: none"> <li>Heavy equipment and construction vehicles may increase vehicular emissions</li> <li>Transport of materials to construction site may increase dust level</li> <li>Earthmoving works and opened land areas increase dust levels</li> <li>Increase in noise level and vibration from excavation and heavy equipment and construction vehicles</li> </ul>	<ul style="list-style-type: none"> <li>Construction vehicles will be maintained to minimize vehicular emissions</li> <li>Provision of temporary enclosures</li> <li>Provide space onsite for construction materials to reduce trips of material delivery</li> <li>Contractor will be required to maintain construction vehicles, equipment and machineries regularly to reduce emissions, avoid smoke belching, and reduce noise</li> <li>Spray water in opened land areas or in sources of dust</li> <li>Transport of dust-generating materials will be covered</li> <li>Observance of low speed by vehicles to reduce noise</li> <li>Noise-generating works will be done between 6AM and 11PM only.</li> <li>No blowing of horns will be allowed</li> <li>Comply with traffic management plan</li> </ul>			PMU, Environmental Safeguard consultant
Construction of ICT building	<ul style="list-style-type: none"> <li>Non-compliance to relevant regulations</li> <li>Potential accidents due to working on heights</li> <li>Occupational and community safety risks</li> <li>Generation of waste</li> </ul>	<ul style="list-style-type: none"> <li>Monitor compliance to regulations</li> <li>Provide PPE to workers</li> <li>Provide first aid kits and fire-fighting system</li> <li>Conduct daily toolbox meeting prior to start of work</li> </ul>	Included in Contractor costs	Contractor, PIU	PMU, Environmental safeguard consultant

Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Estimated Cost	Implementing Unit	Supervising and Monitoring Unit
		<ul style="list-style-type: none"> <li>• Conduct work only from 6AM to 11PM</li> <li>• Provide enclosures to noise-generating works and equipment, and areas generating dust</li> </ul>			
Clean up of construction sites after completion of construction works	<ul style="list-style-type: none"> <li>• Improper disposal of construction debris</li> </ul>	<ul style="list-style-type: none"> <li>• Restore/reinstate all the areas potentially damaged during construction works</li> <li>• Workers will be provided with proper safety gear and equipment</li> <li>• Dispose remaining waste and debris at designated sites</li> </ul>	Included in Contractor costs	Contractor, PIU	PMU, Environmental safeguard consultant
<b>Post-construction stage</b>					
Occupy new building	Improper use and lack of care to the new building	<ul style="list-style-type: none"> <li>• JUST to conduct orientation and awareness to staff and students on proper care of the facility</li> </ul>	Include in the operation cost	PIU, CSE Department	PMU
	Generation of waste	<ul style="list-style-type: none"> <li>• Designate waste management coordinator</li> <li>• Prepare waste management plan with time-bound targets</li> <li>• Conduct yearly training/orientation to trainees on waste management, proper collected, and disposal</li> <li>• Explore measures to implement effectively the principles of reduce, reuse and recycle.</li> </ul>	Include in the operation cost of the	PIU, CSE Department	PMU
	Potential incidence of emergency or natural disaster	<ul style="list-style-type: none"> <li>• Prepare emergency/disaster preparedness plan and procedures</li> <li>• Designate a Disaster Coordinator</li> <li>• Conduct training/orientation/drills on safety and emergency awareness</li> <li>• Provide clear and visible emergency warning signs</li> </ul>	---		PMU

**Table 9.2 Environmental Monitoring Plan**

Project Stage	Parameter	Location	Method of Measurement	Frequency	Responsibility	
					Implementation	Supervision
Construction	Generation of waste and other construction debris	Construction site	Volume of waste or number of trips	Twice a month	Contractor	PIU
	Increase in dust level	Construction site	<ul style="list-style-type: none"> <li>• Frequency of water spraying</li> <li>• Ocular inspection</li> </ul>	Daily	Contractor	PIU, Environmental safeguard consultant
	Ambient air quality	Sampling stations in Table 4.2	<ul style="list-style-type: none"> <li>• PM10 and PM2.5</li> </ul>	Quarterly		
	Ambient noise level	Sampling stations in Table 4.3	Sound level meter (dBA)	Quarterly		
	Availability of project information	PIU and construction site	One-page flyer, project brief or Project Q&A	Quarterly	Contractor, PIU	Environmental safeguard consultant, PMU
	Recruitment from local labour	PIU office	Number of local workers and staff recruited	Monthly	Contractor, PIU	PMU
	Orientation of workers on health and safety	Construction site	Number of participants	Semi-annually	Environmental safeguard consultant, Contractor, PIU	PMU
	Orientation of Contractor and workers on issues like HIV/AIDS, compliance to EMP and ADB requirements, etc.	Construction site	Number of participants	Once before construction	Environmental safeguard consultant, PIU	PMU
	Solid waste management	Construction site	Volume of waste disposed Ocular inspection/spot checks	Every week	Contractor	PIU, Environmental safeguard consultant
	Clear and visible warning signs for safety of workers and JUST community	Construction site and access roads	Ocular inspection/spot checks	Once a month	Contractor	PIU, Environmental safeguard consultant
	Announcement to the public of works schedule	JUST community	Work schedule log sheet	As needed	Contractor	PIU, Environmental safeguard consultant
	Smoke belching construction vehicles	Construction site and access roads	Ocular inspection/spot checking	Weekly	Contractor	PIU, Environmental safeguard consultant
	Proper storage and management of	Construction site	Number of vehicles	Weekly	Contractor	PIU, Environmental

Project Stage	Parameter	Location	Method of Measurement	Frequency	Responsibility	
					Implementation	Supervision
	construction materials and wastes		Ocular inspection/spot checking			safeguard consultant
	Use of personal protective equipment (PPE) and safety gear	Construction site	Ocular inspection/spot checks	Twice a week	Contractor	PIU, Environmental safeguard consultant
	Condition of sanitary facilities and safe drinking water	Construction site	Ocular inspection/spot checks	Weekly	Contractor	PIU
	Good housekeeping	Construction site	Ocular inspection/spot checks	Twice a week	Contractor	PIU
Post-construction	Orientation of students, faculty, and administrative staff on care and maintenance of the building	JUST	Number of trainees	Annually (at start of each term)	<ul style="list-style-type: none"> <li>Office of Chief Engineer</li> <li>Office of Director of Planning, Development and Works</li> </ul>	PIU
	Good housekeeping (also garbage collection and disposal)	JUST	Ocular inspection/spot checks	Monthly	Office of Chief Engineer	PIU
	Condition/maintenance of fire extinguishers/fire-fighting units/fire alarms	JUST	Ocular inspection/spot checks	Annual	Office of Chief Engineer	PIU
	Safety/emergency/disaster manual and procedures	JUST	Check manuals	Annually	Office of Chief Engineer	PIU
	Emergency mock drills	JUST	Number of trainees	Semi-annual	Office of Chief Engineer	PIU
	Greening program/grounds maintenance	JUST	Types of plants, area planted	Annually	Office of Chief Engineer	PIU
	Condition of safety gears and emergency equipment	JUST	Ocular inspection/spot checks	Annual	Office of Chief Engineer	PIU
	Building condition <ul style="list-style-type: none"> <li>Roof</li> <li>Electrical panel and wiring</li> <li>Door handles, windows, hinges and closures</li> <li>Walls and ceilings</li> <li>Stairways and fire exit/escape</li> <li>Storm water drains</li> </ul>	JUST	Ocular inspection/spot checks for cracks, signs of water leaks, damage, fire hazards, etc.	Semi-annual	Office of Chief Engineer	PIU

## **10.0 CONCLUSION AND RECOMMENDATION**

Assessment of potential environmental impacts associated with the construction of the new ICT building within the premises of JUST show that they are mainly during construction phase, of short duration, temporary, reversible, and can be easily mitigated by good and best practices in engineering construction. The potential impacts can be mitigated also by adhering to the design provisions set forth in the BNBC 2006. The mitigation measures are outlined in the EMP and the parameters to be monitored are listed in the EMoP.

Stakeholders were consulted and a GRM to deal with potential complaints on the project was described. Public consultations will continue in varying degrees throughout the project implementation. An environmental safeguard consultant will be engaged at PMU throughout construction phase to ensure capacity and technical support in complying with the requirements of ADB. Environmental monitoring reports will be submitted by the PMU to ADB semi-annually during construction and annually post-construction. These monitoring reports will be similarly disclosed to ADB website.

Given this, UGC and JUST are committed to comply with the requirements of ADB.

## Appendix 1 Environmental Code of Practice (ECoP)

Table below presents the environmental codes of practice (ECoP) to provide guidance in managing potential environmental impacts during construction phase.

**ECoP 1.0** “Chance find” of physical cultural resources

**ECoP 2.0** Managing air quality

**ECoP 3.0** Managing noise and vibration

**ECoP 4.0** Waste Management

**ECoP 5.0** Occupational health and community safety

Area of Concern		Project Activity	Management Measures
ECoP 1.0	“Chance find” of physical cultural resources	Excavation for building foundation and other earthmoving works	<p>The Contractor will ensure that:</p> <ul style="list-style-type: none"> <li>• Excavation works within the area of “chance find” will be stopped</li> <li>• Identify and mark the area with a global positioning system (GPS) unit to determine the exact location and take photographs</li> <li>• Secure the area discovered to avoid potential damage, loss or removal of any movable or transportable object</li> <li>• Inform the PIU of the “chance find” and designate a security personnel until a representative from the Ministry of Cultural Affairs arrives</li> </ul>
ECoP 2.0	Managing air quality	<ul style="list-style-type: none"> <li>• Use of construction vehicles and machinery</li> </ul>	<p>Contractor will do the following:</p> <ul style="list-style-type: none"> <li>• Prepare air quality management plan as part of the overall construction management plan and consult PIU for concurrence</li> <li>• Keep construction vehicles in good working condition and limit idling time of not more than 2 minutes</li> <li>• Cover trucks and other vehicles transporting materials that generate dust</li> <li>• Implement speed limits on vehicular movement within the construction site</li> <li>• Sprinkle water to crusher and orient workers to follow good practices while handling material in concrete-mix plant</li> </ul>

Area of Concern		Project Activity	Management Measures
		<ul style="list-style-type: none"> <li>• Construction activities</li> </ul>	<p>The Contractor will do the following:</p> <ul style="list-style-type: none"> <li>• Spray water regularly (or as needed) to unpaved and opened land areas, material stockpiles, and access roads to contain dust</li> <li>• Dust-generating construction activities will be enclosed to contain dust dispersion</li> <li>• Workers assigned to activities generating high dust level will be provided with PPE such as masks, goggles, etc.</li> <li>• Must ensure that there will be minimum generation of dust and waste while unloading the materials from delivery trucks or construction vehicles</li> <li>• Materials generating dust such as sand and gravel will be covered particularly during non-working hours.</li> <li>• Re-vegetate opened areas (if possible) to limit area of exposed land</li> <li>• Stock cement and other dust-generating materials in covered space</li> <li>• Provide area for mixing and loading of construction materials.</li> <li>• Burning of solid waste within the construction site will not be allowed.</li> <li>• Batching plant (if needed) will be located upwind of the construction site.</li> </ul>
ECOP 3.0	Managing noise and vibration	<ul style="list-style-type: none"> <li>• Vehicular traffic</li> </ul>	<p>The Contractor will ensure:</p> <ul style="list-style-type: none"> <li>• Regular upkeep and maintenance of construction vehicles to minimize generation of unwanted noise</li> <li>• Drivers of construction vehicles to comply with speed limits</li> <li>• Use of horns will be allowed only when necessary</li> <li>• Divert routes to minimize traffic, observe loading and unloading procedures, and to minimize unnecessary noise at the construction site</li> </ul>



Area of Concern		Project Activity	Management Measures
		<ul style="list-style-type: none"> <li>• Use of construction machinery and equipment</li> </ul>	<p>The Contractor will ensure:</p> <ul style="list-style-type: none"> <li>• Enclosure and/or isolation of noise-generating machinery and equipment to contain noise levels</li> <li>• Identify and organize all noise-generating activities to minimize increase in ambient noise levels</li> <li>• Proper and regular maintenance of equipment and machinery to avoid unwanted generation of noise</li> <li>• Avoid the use of alerts, horns, or sirens unless absolutely necessary like emergency</li> </ul>
		<ul style="list-style-type: none"> <li>• Construction works</li> </ul>	<p>Contractor will ensure that:</p> <ul style="list-style-type: none"> <li>• Nearby local residents are notified of noise generating activities, time and duration</li> <li>• Operators of heavy equipment and machineries will be educated/oriented on construction techniques to reduce generation of noise</li> <li>• Temporary noise barriers or enclosures are installed, where needed</li> <li>• Onsite deliveries will be planned to minimize noise from delivery trucks</li> <li>• Noise-generating activities will be conducted only during daytime (6AM to 11 PM)</li> <li>• Schedule of noise-generating activities and deliveries of materials will be coordinated with the PIU to ensure minimal disruption to students and activities in JUST</li> </ul>
ECoP 4.0	Waste Management	<ul style="list-style-type: none"> <li>• Generation of waste at construction sites</li> </ul>	<p>Contractor will do the following:</p> <ul style="list-style-type: none"> <li>• Identify the activities that will generate waste and identify location for disposal</li> <li>• Develop waste management plan for different waste streams prior to start of construction works</li> <li>• Orient workforce on disposal of waste, the location of disposal site and specific requirements for management of these sites</li> <li>• Wastes that cannot be re-used will be disposed of safely at designated sites</li> </ul>

Area of Concern		Project Activity	Management Measures
			<ul style="list-style-type: none"> <li>• Minimize generation of waste by implementing 3Rs (Reduce, Re-use, Recycle), and segregate waste at source</li> <li>• Waste will be transported in fully covered trucks to prevent spillage along the way</li> <li>• Provide appropriate bins/containers for waste at construction site</li> <li>• Conduct orientation to workforce on waste management practices</li> <li>• Require workers to observe good housekeeping at all times</li> </ul>
		<ul style="list-style-type: none"> <li>• Handling of hazardous waste</li> </ul>	<p>Contractor will ensure that:</p> <ul style="list-style-type: none"> <li>• Chemical wastes are stored in sealed container and properly labeled</li> <li>• All chemical containers such as paints are labeled properly for easy identification</li> <li>• Material Safety Data Sheets (MSDS) of all chemicals onsite during construction are maintained and properly recorded</li> <li>• Chemical and other hazardous materials are stored in banded place or in an area lined with impervious material to prevent soil contamination and away from drainage system</li> <li>• Store sufficient stock of absorbent materials for used chemicals or spent lubricants, lube oil, etc.</li> </ul>
ECOP 5.0	<p>Occupational health and community safety</p> <p>The Contractor will be responsible to include the protection of every person and nearby property from construction accidents. The Contractor will be responsible for complying with all safety requirements of GOB and any other measures necessary to avoid</p>	<ul style="list-style-type: none"> <li>• Construction works at the new ICT Centre for Excellence building</li> </ul>	<p>The PIU and the Contractor shall inform the JUST community and adjacent settlements along the access roads of the following:</p> <ul style="list-style-type: none"> <li>• Schedule of construction works, routing of traffic (if needed), possible health concerns (exposure to dust, noise, and vibration)</li> </ul> <p>Contractor will do the following:</p> <ul style="list-style-type: none"> <li>• Set-up a health and safety committee and designate a Safety Officer</li> <li>• Provide workers with personal safety equipment (PPE) such as footwear, gloves and eye protection devices, helmets, etc.</li> </ul>

Area of Concern	Project Activity	Management Measures
<p>accidents, including the following:</p> <ul style="list-style-type: none"> <li>(i) Notice or signboards shall be properly installed at the construction site</li> <li>(ii) Conduct safety training or orientation to workers prior to start of work;</li> <li>(iii) Provide required PPE to workers and its use will be mandatory;</li> <li>(iv) In case of an emergency, suspend all work.</li> </ul> <p>To maintain good community relations, the Contractor will:</p> <ul style="list-style-type: none"> <li>(i) Inform local authorities and community about construction and work schedules, interruption of services, and rerouting of traffic.</li> <li>(ii) Restrict construction activities at night. If needed, ensure that night work is carefully scheduled and the community is properly informed so they can take necessary measures.</li> </ul>		<ul style="list-style-type: none"> <li>• Prepare an emergency action plan</li> <li>• Maintain PPE properly by cleaning dirty ones and replace damaged sets.</li> <li>• Provide adequate lighting, drainage systems to prevent water stagnation, and adequate space to administer first aid</li> <li>• Implement appropriate standards of safety to all workers and site visitors to comply with the national requirements and the World Bank-IFC Environmental, Health and Safety Guidelines 2007</li> <li>• Conduct toolbox meetings prior to start of construction works. Record names of workers present during the meetings. Worker not joining toolbox meeting will not be allowed to work.</li> <li>• Enforce safety procedures and provide training on PPE to workers</li> <li>• Designate someone to deal with community and occupational health and safety</li> <li>• Clear and visible danger and warning signs shall be placed as soon as construction begins and will remain until works are completed.</li> <li>• Keep a record of workers and place assigned</li> </ul>
	<ul style="list-style-type: none"> <li>• Child labor</li> </ul>	Contractor will not hire workers below 15 years old
	<ul style="list-style-type: none"> <li>• Training and record keeping</li> </ul>	<p>The Contractor will:</p> <ul style="list-style-type: none"> <li>• Keep a record of occupational accidents, diseases, and injuries</li> <li>• Prevent work-related accidents or injury by minimizing workplace hazards consistent with international best practice</li> <li>• Ensure health care facilities and first aid kits are readily available</li> <li>• Train construction workers about general health and safety practices, and on specific hazards related to their work</li> </ul>

Area of Concern		Project Activity	Management Measures
		<ul style="list-style-type: none"> <li>• Security of construction site</li> </ul>	<p>Contractor will ensure that:</p> <ul style="list-style-type: none"> <li>• Security personnel will be deployed to prevent unauthorized entry at construction site</li> <li>• All the tools, equipment and construction materials at the site are accounted for, identified, clearly labeled/marked, and recorded</li> <li>• Maintain a record of tools' serial numbers and check inventory on a regular basis</li> <li>• Implement an inventory system where tools and equipment are checked in and out, securely stored when not in use to prevent theft</li> <li>• Provide proper fencing of construction site perimeter with secured chain and lock</li> <li>• Construction site will have controlled access points to allow for close monitoring of entry and exit from the site</li> <li>• Workers will have proper identification while within the site</li> <li>• Staff or workers required to have access to the site after working hours will be notified with the PIU</li> <li>• Job site will be adequately lighted</li> <li>• Pre-employment investigations are conducted to verify previous employment, references (if needed), education and criminal background</li> </ul>

## Appendix 2

### List of Participants and Photographs during Consultation

**BAN: Innovations in Tertiary Education for Competitiveness in Information Technology Project**

Public Consultation Meeting

held on April 1, 2019 (Monday)

Venue: Conference Room, Vice Chancellor, 4<sup>th</sup> Floor, Administrative Building  
Jashore University of Science and Technology (JUST)

#### List of Participants

Sl No.	Name	Occupation	Male	Female	Cell No.	Signature
1.	Dr. Syed Md. Gulib	Associate Prof. CSE	✓		01781408274	
2.	Dr. Md. Asif Nishary	Assistant Prof. CSE	✓		01303378254	
3.	Abul Nabil Hossain	Env. Consultant (ADB-NATIA)	✓		01715445920	
4.	RUBY SOCORRO M. ARICA	AOB Consultant		✓		
5.	MD. AKRAMUL HAN	Perish Imam	✓		017713121	
6.	Md. Helal Uddin Pathan	Chief Engg JUST	✓		01709818149	
7.	Dr. Md. Nazmul Hossain	Secretary, Teachers Association	✓		0170368065	
8.	Dr. M. Nazimul Rahman	Associate Prof.	✓		01797757421	
9.	Dr. Md. Alam Hossain	Assistant Prof. CSE	✓		01749032411	
10.	Md. Touhid Imam	Executive Engineer	✓		01788502727	
11.	Farkhna Yasmin	Lecturer, English		✓	01716805380	
12.	Charity Rany Das	Lecturer, English			01933734397	
13.	Fatema Tuj-Zahra	Asst. Prof.		✓	01706363417	
14.	Mohammad Nowsin Anis	Asst. Prof.	✓		01714-492550	
15.	Jannatul Ferdush	Lecturer		✓	01731791101	
16.	Eng. Md. Anwar	Asst. Prof.	✓		01717283009	



Some photographs during consultation

### Appendix 3 Sample Complaint Form for GRM

Complaint/Suggestion/Comment Form		
Loan No.: _____ BAN: Improving Computer and Software Engineering Tertiary Education Project		
Please provide the following information:		
		Date of Filing: _____
Name of Person/Organization:		_____
Contact Details:		_____
Address		_____
Telephone/Mobile Phone		_____
Email (if available)		_____
Signature of Person Filing Complaint		_____
Representative in filing this complaint?		Yes
Please provide details		Name _____
		Address _____
		Telephone _____
		No
		Not applicable
Complaint/Suggestion/Comment (Please provide details as appropriate: what happened, how and why it happened, when and where, how many times it occurred)		
_____		
Please describe any inconvenience/harm caused or may have been caused		

<b>Please provide suggestion to resolution of your complaint (if any)</b>			
<b>Please let us know how you prefer to be contacted</b>	Mail or email		
	Phone		
	Meeting		
<b><i>Contractor/PIU/PMU Use only</i></b>			
Recorded by (Name of designation of Contractor/PIU staff)			
Reviewed by (Name and designation of Contractor/PIU staff)			
Action(s) taken to resolve the complaint/comment/suggestion			
	No action needed		
Action/decision disclosed to Complainant	Yes	No	Not required
	Date		
Manner of disclosure	Mail		
	Phone		
	Meeting		
	Not required		

PMU Environmental Safeguard Form 1 - GRM

**Appendix 4**  
**Terms of Reference**  
**Environmental Safeguard Consultant, PMU**

**(National, 4 person-months within 24 months, intermittent)**

Preferably a post-graduate degree in environmental engineering, environmental sciences or equivalent discipline with a minimum of 7 years in environmental management and monitoring and in oversight of project implementation and compliance. A strong knowledge of the applicable environmental regulations and other construction requirements in Bangladesh as well as the environmental requirements of ADB following the Safeguard Policy Statement (SPS) 2009 will be mandatory. The candidate should have good communication skills (oral and written), a good team player with strong organizational and problem solving skills.

Duties and tasks include, but not limited to the following:

- (i) Provide technical support to the PMU to ensure that all environmental requirements of ADB including occupational health and safety requirements of the GOB are complied with by the project;
- (ii) Ensure that the EMP and EMoP are included in the bid documents and civil works contracts;
- (iii) Implement a system for monitoring the environmental safeguards;
- (iv) In coordination with the PIU-designated staff, conduct regular site visits at the construction sites to verify/check compliance to EMP and EMoP including adherence to occupational health and safety provisions and core labor standards.
- (v) Together with the PIU-designated staff and the representative of the contractor, conduct stakeholder consultations, as appropriate, to determine if there is any concern during construction;
- (vi) Assist in obtaining associated government permits (if any) prior to start of construction works;
- (vii) Take immediate action in the event of unexpected adverse impact or ineffective mitigation measures identified during implementation and in preparing the corrective action plan;
- (viii) Provide technical support to the PIU-designated staff in drafting the environmental monitoring reports required by ADB, and in monitoring compliance of contractor to the environmental, health and safety requirements;
- (ix) Address any grievances through the GRM in a timely manner, prepare record of such grievances for inclusion in the environmental monitoring report;
- (x) Prepare the semi-annual environmental monitoring reports to be submitted to ADB, and upon ADB review, address any comments raised (if any); and,
- (xi) Assist in any relevant works that may be assigned by PMU/PIU.



**Appendix 5**  
**Proposed Format of Environmental Monitoring Report during Construction Phase**

# Environmental Monitoring Report

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Reporting Period      {From Month, Year to Month, Year}  
Date                      {Month, Year}

## BAN: Improving Computer and Software Engineering Tertiary Education Project

Prepared by the University Grants Commission of the Ministry of Education for the Asian Development Bank

This environmental safeguard monitoring report is a document of the borrower and made publicly available in accordance with ADB's Public Communications Policy 2011 and the Safeguard Policy Statement 2009. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff

## TABLE OF CONTENTS

### Page

#### **Executive Summary**

- Brief status of environmental compliance during the coverage period

#### **1.0 Introduction**

- 1.1 Brief Project Description
- 1.2 Project Progress Status and Implementation Schedule

#### **2.0 Compliance to National Regulations**

{These are just sample environmental regulations}

- 2.1 Environmental Conservation Rules 1997
- 2.2 Bangladesh Labour 2013

#### **3.0 Compliance to Relevant Environmental Requirements from the ADB Loan Agreement**

- 3.1 Schedule 5 {prepare a matrix to show how compliance was achieved}

#### **4.0 Compliance to Environmental Management Plan**

{Refer to the EMP of the Project}

#### **5.0 Safeguards Monitoring Results and Unanticipated Impacts**

{Refer to the Environmental Monitoring Plan and document any exceedence to environmental standards (if any), or any unanticipated impact not included in the EMP and any correction action/measures taken}

#### **6.0 Implementation of Grievance Redress Mechanism and Complaints Received from Stakeholders**

{Summary of any complaint/grievance and the status of action taken}

#### **7.0 Conclusion and Recommendations**

{Any follow-up action required to be monitored for the next submission}

**Appendix 6**  
**Proposed Format of Environmental Monitoring Report Post-construction**

# Environmental Monitoring Report

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Reporting Period      {From Month, Year to Month, Year}  
Date                      {Month, Year}

## BAN: Improving Computer and Software Engineering Tertiary Education Project

Prepared by the University Grants Commission of the Ministry of Education for the Asian Development Bank

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## TABLE OF CONTENTS

	Page
<b>Executive Summary</b>	
• Brief status of environmental compliance during the coverage period	
<b>1.0 Introduction</b>	
1.1 Brief Project Description	
1.2 Status/condition of the new buildings	
{i.e., a checklist can be provided to indicate condition of the interior and exterior of the building}	
<b>2.0 Compliance to National Regulations</b>	
{These are just sample regulations}	
2.1 Disaster Management Act 2012 (relevant requirements for safety of school/university buildings)	
<b>3.0 Compliance to Environmental Management Plan</b>	
{Refer to the EMP during post construction}	
<b>4.0 Results of Environmental Monitoring Plan</b>	
{Refer to the EMoP during post construction}	
<b>5.0 Conclusion and Recommendations</b>	
{Any follow-up action required to be monitored for the next submission}	

**Appendix 7**  
**Sample Environmental Site Inspection and Monitoring Checklist**

**Loan No.:**

Name of University	Location
Inspection Date	Inspection Time
Inspector	Weather at time of inspection:

Items for Inspection	Y	N	NA	Remarks (i.e. problem observed, possible cause of non-compliance and/or proposed corrective action)
<b>Site Office</b>				
Site office established				
Contractor appointed an EHS supervisor				
EHS supervisor or designated person on-site				
Copies of EMP, contract document, and environmental clauses on-site				
Details of construction (i.e., name of contractor, duration of construction, emergency hotline, safety, etc.) disclosed on-site				
Details of grievance redress mechanism (i.e., contact person, complaints hotline, etc.) disclosed onsite				
Complete first aid kits on-site				
Photographs of before and after completion of work on board				
Incident register book on-site				
Complaint/visitor's comment book available				
Record of regular consultation of Contractor to University management and/or nearby residents to check if there are environmental concerns				
Any complaint filed with the contractor by staff and settlements				
Disturbed areas properly re-vegetated after completion of work				
<b>Emergency Preparedness and Response</b>				
Fire extinguishers/fire-fighting equipment properly maintained and not expired				
Fire escapes properly marked, clear, and not obstructed				
Emergency contacts available in case of any incident				
Accidents/incidents reported, reviewed, and corrective/preventive actions recorded				

Items for Inspection	Y	N	NA	Remarks (i.e. problem observed, possible cause of non-compliance and/or proposed corrective action)
<b>Occupational Health and Safety</b>				
Provision of labor and equipment shed				
Provision of sanitation facilities and safe drinking water				
Use of personal protective equipment (PPEs)				
Installation materials and equipment storage				
Separate storage of fuel and lubricant				
Training on OHS, use of PPE, etc. done before construction works				
Clear danger and warning signs on-site for students, faculty, and community				
Fencing of construction site and designation of security personnel				
Good housekeeping - site kept clean and tidy				
Containers properly labelled for easy recycling or waste segregation				
Special facilities for female workers				
Bin for collecting garbage and food waste				
<b>Air Quality</b>				
Opened land and construction sites sprayed with water to minimize generation of dust				
Any evidence of excessive dust generation				
Stockpiles of dusty materials and dust-generation activities like handling of cement done in enclosed areas or sprayed with water				
Vehicles carrying dusty loads/materials covered or watered over before leaving the site				
Construction equipment well maintained (any black smoke or smoke belching observed)				
Demolition work areas watered				
Speed control measures applied (e.g. speed limit sign)				
<b>Noise</b>				
Evidence of excessive noise				
Any noise mitigation measure adopted (e.g. use noise barrier/enclosure)?				
Prohibition of using megaphone or whistle on-site				
Use of well-maintained equipment and vehicles				

Items for Inspection	Y	N	NA	Remarks (i.e. problem observed, possible cause of non-compliance and/or proposed corrective action)
<b>Water Quality</b>				
Sanitary facilities for workers equipped with on-site treatment system				
Wastewater discharged to soil				
Evidence of oil spill				
Chemicals properly stored and labelled				
Spill kits/sand /saw dust used for absorbing chemical spillage readily accessible				
Special facilities for female labor				
Construction waste/recyclable materials and general refuse removed off-site regularly				
Water pipe leakage and wastage prevented				

**Reviewed by:**

Name and signature \_\_\_\_\_  
Designation in PIU \_\_\_\_\_

Date \_\_\_\_\_