Initial Environmental Examination (IEE)

Project Number: 55148-001
January 2026

BAN: Skills for Industry Competitiveness and Innovation Program (SICIP)

Construction of Proposed 12 Storied - Executive Development Centre (EDC) For Bangladesh University of Textiles (BUTEX), Dhaka

Prepared by the Finance Division under the Ministry of Finance for the Asian Development Bank.

Asian Development Bank

ABBREVIATIONS

ADB	-	Asian Development Bank
DoE	-	Department of Environment
DU	-	Dhaka University
EARF	-	Environmental Assessment and Review Framework
ECA	-	Environment Conservation Act
ECoP	-	Environmental Code of Practice
ECR	-	Environment Conservation Rules
EDC	-	Executive Development Centers
EMP	-	Environmental management Plan
FGD	-	Focus Group Discussions
IEE	-	Initial Environmental Examination
IT	-	Information Technology
MoF	-	Ministry of Finance
MoFCC	-	Ministry of Environment, Forest and Climate Change
MoLE	-	Ministry of Labour and Employment
MoTJ	-	Ministry of Textiles and Jute
NCS	-	National Conservation Strategy
NEMAP	-	National Environmental Management Action Plan
NEP	-	National Environmental Policy
NHRDF	-	National Human Resource Development Fund
NOC	-	No Objection certificate
NSDA	-	National Skills Development Authority
R&S	-	Research and Development
RBL	-	Result Based Lending
REA	-	Rapid Environmental Assessment
RMG	-	Ready-Made garments
SDCMU	-	Skills Development Coordination and Management Unit
SICIP	-	Skills for Industry Competitiveness and Innovation Program
SME	-	Small and Medium Enterprises
SPS	-	Safeguard Policy Statement

WEIGHTS AND MEASURES

Ha	hectares
Km	kilometers
M	meters
masl	meters above sea level
MT	metric tons

CURRENCY EQUIVALENTS

(as of 24 May 2024)

Currency unit	–	taka (Tk)
Tk1.00	=	$0.0086
$1.00	=	Tk 116

NOTE

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

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EXECUTIVE SUMMARY

INTRODUCTION

Background and Project

Aligned with the Bangladesh country partnership strategy 2021−2025 and broader Bangladesh Government Program “Human capital enhanced for sustainable economic development and inclusive growth”, the proposed RBL Result Based Lending (RBL) program ‘Skills for Industry Competitiveness and Innovation Program (SICIP)’ will increase provision of skilled workforce for industry competitiveness and innovation. The key major outputs of the envisaged for the RBL program are: (i) Training for advanced technical skills in priority and emerging sectors improved; (ii) Managerial capabilities and green innovation capacity strengthened; (iii) Socially inclusive skilling and upskilling expanded; and (iv) Institutional capacity for skills monitoring and management enhanced.

Under Output 1 the proposed RBL program aims to cultivate higher-level technical skills and enhance institutional capacity to produce skilled workers to adept with emerging technologies including green technologies. To achieve this aim, under current scope, the RBL program will construct/establish smart textile technology living labs (STTLs) in two textile engineering colleges (Bangabandhu Textile Engineering College in Tangail and Chittagong Textile Engineering College in Chattogram), Narsingdi Auto-Tech Training Institute (NATI) at Narshingdi Polytechnic Institute (NPI) and construct one academic building (10 story) in the East West University. In addition, extension of classrooms and some renovation work will be carried out at the Institute of Business Administration (IBA), Dhaka University and Bangladesh University of Textiles (BUTEX).

Implementation arrangement

The Finance Division in MOF will be the executing and implementing agency. The Skills Development Coordination and Management Unit (SDCMU)—established under SEIP—will continue to serve as the program management unit to facilitate, coordinate, and monitor all project activities. The key implementing partner agencies include the Technical and Madrasa Education Division in the Ministry of Education; Ministry of Expatriate Welfare and Overseas Employment; Ministry of Industries; and Ministry of Textiles and Jute. An inter-ministerial project steering committee, chaired by the Secretary of Finance Division, will provide overall policy advice and oversight, approval of annual operation plans, review of achievements against targets, and ensuring compliance with fiduciary oversight arrangements.

The Initial Environmental Examination (IEE)

This Initial Environmental Examination (IEE) has been prepared, in accordance with the environmental assessment requirements of the Asian Development Bank (ADB) and the Government of Bangladesh, as well as the guidance provided by the EARF developed for guiding the environmental safeguards principles adopted for SICIP, to help ensure that the infrastructure proposed under the Investment Project part of the Program meets a high standard for environmental and social responsibility. As proposed investments are dispersed across many locations within Bangladesh, it is considered appropriate for each location to be covered by a context-specific IEE. This IEE report is applicable to “Construction of Proposed 12 Storied - Executive Development Centre (EDC) For Bangladesh University of Textiles (BUTEX), Dhaka”.

LEGAL AND POLICY FRAMEWORK

Institutional framework

The lead environmental agency in Bangladesh is the Department of Environment (DOE), under the Ministry of Environment, Forests and Climate Change (MOEFCC). DOE is charged with furthering environmental conservation, improvement of environmental standards, and control and mitigation of environmental pollution. This mandate positions DOE as a key regulator of a broad range of developments in the infrastructure, industrial and commercial sectors, including both publicly and privately funded initiatives. DOE is responsible for administering the country's central environmental law, which provides the framework for environmental impact assessment.

Other agencies with important environmental mandates include the Bangladesh Forests Department (also under MOEFCC), the Ministry of Water Resources, the Ministry of Fisheries, and the Ministry of Land. The laws and regulations administered and enforced by these other agencies do not structure the environmental assessment process directly but may often come into play in the consideration of the suitability and permissibility of proposed infrastructure developments by DOE.

Occupational health and safety are key considerations of the environmental assessment of proposed infrastructure. The Ministry of Labour and Employment (MoLE), particularly its Department of Labour and Department of Factory and Establishment Inspection, is of direct relevance to the environmental assessment process, as it administers and enforces the country's legislation, rules and standards governing industrial workplaces, including construction sites and most industrial facilities where physical labour is undertaken.

National policies, laws and rules applicable to the project

a. National Environmental policy 1992 (revised in 2018)
b. National Environmental Management Action Plan (NEMAP), 1995
c. National Bio-safety Strategy & Action Plan 1995
d. A Roadmap for Clean Fuels and Vehicles in Bangladesh, 2011
e. National Action Programme on Desertification, Land Degradation and Drought (DLDD) 2016-2024
f. Ecologically Critical Area Management Rules, 2016.
g. Medical Waste (Management and Processing) Rules, 2008
h. Bangladesh Biosafety Rules, 2012
i. Bangladesh Biological Diversity Act 2017
j. Natural Water Reservoir Conservation Act, 2000
k. National Forestry Policy 2016
l. National Conservation Strategy 1998 and Draft Update 2013
m. National 3R (Reduce, Reuse & Recycle) Strategy 2010
n. Bangladesh Climate Change Strategy & Action Plan (BCCSAP) 2009
o. Bangladesh Delta Plan 2100
p. National Disaster Management Plan 2010.
q. Nationally Determined Contributions (NDCs)
r. Five Year Plan
s. Sustainable Development Goals (SDGs)
t. National Adaptation Program (NAP) 2022
u. Other Sectoral Policies/Strategies like Industry, Agriculture, Energy, Water, Health, etc.
v. National Bio-safety Framework and Guidelines
w. Guidelines on Environmental Management, Waste Treatment and Workers' Occupational Health and Safety for Ship Breaking Yard in Bangladesh

x. Establishing National Landuse and Land Degradation Profile 2018 (proposed)

Anticipated DoE assessment category. The infrastructure development proposed for the EDC building within BUTEX campus under the project will appropriately be considered to fall into the 'Orange' assessment category. The investments do not include any components that would trigger assignment to the 'Red' category, but do encompass components (multi-storied buildings, diagnostic laboratory) included in the 'Orange' list in Schedule 1 of the Environment Conservation Rules 2023. This IEE report will be reviewed by DoE, and the anticipated categorization will be confirmed at that time.

Updated ADB categorization. Based on the findings presented in this IEE, it is confirmed that some of the infrastructure components proposed for BUTEX additional building will have at least some negative impacts requiring mitigation, but also unlikely that any will generate impacts of a scale, complexity or severity that would warrant detailed environmental research or development of highly novel mitigation strategies. Accordingly, the Category B classification, assigned to the project at the early concept stage based on ADB screening, is considered valid for this investment location. This could change if the design, scale, nature, or location of any proposed components undergoes significant modification before or after project approval.

PROJECT DESCRIPTION

Project Location

The proposed additional academic and training facility for Bangladesh University of Textiles (BUTEX)—the Executive Development Centre (EDC)—will be constructed within the existing BUTEX campus located at 92 Shaheed Tajuddin Ahmed Avenue, Tejgaon Industrial Area, Dhaka-1208 (Figure III 1). The EDC is planned as a 12-storied facility (G+11) with one basement, designed as Building Type B1 (BNBC), with a total floor area of ~12,980 m² on a campus plot of ~2,050 m² (Figure III 2). The project footprint includes defined open/green areas and setbacks, and the site fronts an 18 m wide road on the south (front side), supporting construction access and future operational circulation.

Proposed Infrastructures

Overall building configuration and site parameters. The proposed facility is the Executive Development Centre (EDC) designed as a 12-storied building (G+11) with one basement, classified as Building Type B1 (BNBC). The architectural schedule notes: Land area ~2,050 m²; ground coverage ~1,015 m²; open space ~1,035 m²; paved area ~510 m²; green area ~510 m²; total floor area ~12,980 m². Vertical circulation includes 2 stairs and 4 lifts (Figure III-5).

BASELINE ENVIRONMENT

Siting. The proposed subproject (Executive Development Centre—EDC) will be implemented within the existing Bangladesh University of Textiles (BUTEX) campus at 92 Shaheed Tajuddin Ahmed Avenue, Tejgaon Industrial Area, Dhaka-1208 (Figure IV-1). The campus is in a highly urbanized mixed industrial–commercial–institutional setting of Dhaka, and Shaheed Tajuddin

Ahmed Avenue functions as a major thoroughfare through Tejgaon Industrial Area. The immediate surroundings include dense built-up development, internal campus buildings and open activity spaces; therefore, baseline sensitivities relate mainly to construction nuisance (dust/noise), traffic/access management, and drainage/waterlogging risks during monsoon rather than natural habitat disturbance (Figure IV-1).

Topographic relief. Topography of BUTEX region of Dhaka is flat in nature, as the surface area ranges between 12 and 14 metres (calculated from topographic map). In general, the surface elevation of the area Dhaka are ranges between 1 and 14m and most of the built-up areas located at elevations of 6-8m. The land area above 8 meters msl covers about 20 square kilometers. The land ranging from 6-8 meters while 170 square kilometers of Greater Dhaka is below 6 meters (FAP 1991). See Figure IV 2 for topographic relief of the project region.

Seismicity. Dhaka lies within 50 to 500 km distances from the seismogenic faults and sits on the Burma Arc detachment fault. Dhaka city falls in seismic zone II of the seismic zoning map of Bangladesh.

Rivers and channels. Dhaka city is surrounded by four major river systems. The south of Dhaka city is surrounded by the Buriganga River. The western part of Dhaka is bounded by the Truag River which is connected by a small Tongi Khal on the north. The eastern part of Dhaka is bounded by the Balu River which is also hydrologically connected with Tongi Khal.

Drainage system and waterlogging. The BUTEX campus is located in the Tejgaon area, where the municipal drainage network is comparatively well developed and connected to the citywide system, unlike several peripheral wards of Dhaka where drainage coverage remains poor. The proposed EDC site drains into the adjacent roadside drainage system, which in turn discharges into designated retention and detention areas, including nearby khals (canals), before eventually reaching the surrounding rivers. This existing connectivity is an important consideration for the detailed drainage design of the EDC building, since any additional impervious surface or paved area introduced by the project should be matched with adequate on-site retention or infiltration capacity to avoid overloading this shared municipal system.

Flooding. Over the last 25 years or so, Dhaka city and its adjoining areas are gaining the inertia of flood hazards and increasing loss of human resource damage (e.g., Gain at al., 2015[1]; Dewan et al., 2007[2]). In recent past, Dhaka city has seen severe river floods in 1950, 1955, 1970, 1974, 1980, (Huq and Alam, 2003[3]), 1987, 1988, 1998 and 2004 (Gain et al., 2015). The most memorable and devastating flood was in 1998 causing damage to approx. 262,000 houses worth

[1] Gain, A. K., Mojtahed, V., Biscaro, C., Balbi, S., Giupponi, C. (2015): An integrated approach of flood risk assessment in the eastern part of Dhaka City. - Natural Hazards, 79, 3, pp. 1499—1530.

[2] Dewan, AM., Islam, MM., Kumamoto, T. and Nishigaki, M. (2007). Evaluating Flood Hazard for Land-Use Planning in Greater Dhaka of Bangladesh Using Remote Sensing and GIS Techniques. Water Resource Management (2007) 21:1601–1612, DOI: 10.1007/s11269-006-9116-1.

[3] Huq, S. and Alam, M. (2003) Flood Management and Vulnerability of Dhaka City, In: Chapter 9 - Building Safer Cities: The Future of Disaster Risk, Disaster Risk Management Series. Kreimer, A., Arnold, M. and Carlin, A. (eds.) The World Bank, Disaster Management Facility, 2003 Washington, D.C.

BDT 2.3 billion (Islam 1998), about 1000km road surface (Siddique and Chowdhury 1998[4]), 223km of box culverts and about 510km of tank sewer and sewerage line (Siddique and Chowdhury 1998) and damage to water supply and sanitation worth USD 10 million (Faisal 1998 as reported in Faisal, Kabir and Nishat 2003[5]).

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION

Approach and Methodology

The IEE study has been conducted following the ADB SPS (2009), World Bank's Environmental and Social Framework (ESF) 2018, EIA Guidelines for Industries, prepared by the DoE in 2021 in accordance with the requirement of the Environment Conservation Rules (ECR 2023). The IEE process adopted in this study involves identification of the key impacts on natural and social environment and evaluation of the significant impacts along with recommendation of initiative measures as well as listing of unresolved environmental issues. The IEE includes collection of baseline information, setting of boundaries, impact assessment, suggestion of mitigation measures and alternative sites providing an environmental management plan.

Findings of Impact Assessment: Pre-construction phase

Climate change, drainage and waterlogging

Impacts. For the EDC subproject, siting does not create major quarry/borrow-pit related impacts because bulk construction materials are expected to be procured from the local market through licensed suppliers. The key siting-linked risk instead is local runoff concentration and water: basement excavation, temporary stockpiles, and altered micro-drainage pathways can increase ponding and sediment-laden discharge if temporary drainage is not carefully planned and maintained during early works (Tawhid, 2004). In the Tejgaon–Hatirjheel catchment context, this can also contribute to off-site drainage congestion if drains are blocked or if silt is washed into the storm diversion/pipe system (Hossain & Rafiq, 2016).

Mitigation: The EDC design and pre-construction planning should adopt a conservative "design-for-intense-rainfall" approach, consistent with Dhaka's waterlogging history and climate risk context (Climate Centre, 2024 ; Tawhid, 2004). Priority measures include: (i) Confirm outfall connectivity and invert levels (campus drain → municipal drain/khals) before mobilization, including dry-season and wet-season functionality checks; (ii) Set finished plinth levels and basement protection measures (ramp drainage, sump/pump capacity, backflow prevention) based on verified local levels and historical ponding points; (iii) Prepare a temporary drainage and sediment control plan for excavation and early works (perimeter drains, silt traps, covered stockpiles, stabilized haul routes) to prevent drain clogging and off-site sedimentation; and (iv) Include O&M responsibilities for keeping drains functional (routine desilting, debris screens, and

[4] Siddique, Q. I. and Chowdhury, M. H.: 1998, Flood-98: Losses and Damages, National Seminar on Flood '98 and Management of Floods in Future (December 8, 1998), Jointly organized by National Committee for Relief and Rehabilitation and Dhaka University, Dhaka.

[5] Faisal IM, Kabir MR, Nishat A (2003) The Disastrous Flood of 1998 and Long-Term Mitigation Strategies for Dhaka City, Natural Hazards 28: 85–99, 2003.

emergency clearing during monsoon) as a binding requirement in contractor method statements (Tawhid, 2004)..

Public health and safety

Impacts: The BUTEX campus is located at 92 Shaheed Tajuddin Ahmed Avenue, Tejgaon Industrial Area, Dhaka, an area characterized by high traffic volumes and mixed industrial–institutional land use. During the pre-construction and construction periods, the EDC site will generate additional movements of trucks, concrete mixers, material delivery vehicles, and construction equipment, increasing the risk of (i) vehicle–pedestrian collisions, (ii) vehicle–vehicle conflicts at entry/exit points, and (iii) congestion and unsafe crossing behavior, particularly during peak class/office hours. These risks are heightened in dense urban settings where pedestrians, rickshaws, motorcycles, and heavy vehicles often share limited carriageway space. The EDC site frontage includes an 18 m wide road on the south side, which will likely be the principal construction access corridor and therefore requires strict traffic control arrangements (BUTEX Detailed Working Drawings, 2025).

Mitigation: A Traffic Management Plan (TMP) shall be prepared by the Contractor (and integrated into the site-specific CEMP) and implemented under supervision of the Construction Supervision Consultant (CSC), with coordination as required with Dhaka Metropolitan Police (Traffic Division) and relevant city authorities. Key TMP and public-safety provisions for BUTEX EDC shall include: (i) Dedicated, controlled access/egress points with trained flagmen, warning signage, lighting, and speed calming measures; (ii) Time-window scheduling for heavy vehicle deliveries (avoid peak student movement periods; avoid school/office peaks where possible); (iii) Physical segregation of pedestrians from construction traffic using continuous barriers/hoarding, marked walkways, and safe crossing points—especially along the southern frontage road (BUTEX Detailed Working Drawings, 2025); (iv) A strict on-site traffic circulation plan (one-way loops where feasible, marshalled reversing, spotters for blind zones, no idling policy at gates).

Findings of Impact Assessment: Construction phase

Water quality

Impacts. For the BUTEX Executive Development Centre (EDC), the highest construction-phase water quality risks will occur during site clearing, excavation, and basement works, when exposed soils can be mobilized by rainfall and conveyed into on-site drains and downstream municipal drainage. Because the EDC includes one basement and substantial paved/working surfaces will be created during construction, uncontrolled runoff can carry sediment (TSS/turbidity), concrete residues (high pH), and construction debris into the campus drainage network and off-site receiving waters (BUTEX Detailed Working Drawings, 2025). Where outfalls ultimately connect to the broader Hatirjheel–Begunbari drainage/waterbody system, water quality is already recognized as stressed in parts of the system, making additional sediment/alkaline discharges particularly undesirable (Pasha et al., 2023).

Mitigation. Erosion, sedimentation, and alkaline runoff impacts can be largely prevented through standard, enforceable construction water pollution controls, implemented through the Contractor's Construction Environmental Management Plan (CEMP), consistent with ADB safeguard requirements on pollution prevention and control (Asian Development Bank [ADB], 2009). Minimum measures include: (i) Erosion and sediment control before excavation begins: perimeter silt fencing, sediment traps/basins (as space allows), stabilized site entrances, and prompt covering of stockpiles; (ii) Dedicated concrete washout (lined, bermed, and signed) and a strict prohibition on washing cement/concrete residues into drains; (iii) Monsoon preparedness: temporary drainage channels around excavation, routine drain cleaning, and on-site housekeeping to prevent drain blockage by spoil and waste; and (iv) Secondary containment for fuels/chemicals (bunded storage), plus drip trays under stationary equipment.

Air quality

Impacts: Construction of the BUTEX Executive Development Centre (EDC) is likely to affect local air quality primarily through dust (PM_{10}) and fine particulates ($PM_{2.5}$) generated from site clearing, excavation/basement works, material handling, concrete works, and on-site/approach-road traffic. These emissions will occur against a Dhaka background where particulate concentrations are already high and strongly seasonal, typically worsening in the dry winter months (Department of Environment [DoE], 2024; Centre for Policy Dialogue [CPD], 2023). Under Bangladesh's Air Pollution (Control) Rules, 2022, ambient air quality standards and associated regulatory expectations apply, meaning uncontrolled construction dust may lead to non-compliance risk and heightened scrutiny (Air Pollution (Control) Rules, 2022).

Mitigation: The Contractor shall implement an air-quality control program through the CEMP consistent with ADB safeguard expectations on pollution prevention and control (Asian Development Bank [ADB], 2009) and aligned with national requirements (Government of Bangladesh, 2022; MoEFCC, 2024). Minimum measures include: (i) Site enclosure and access control: Continuous hoarding/fencing around the work zone; controlled gates; clear signage; and restriction of vehicle routes within campus; (ii) Dust suppression: Regular water spraying on exposed areas, excavation faces, and haul routes; frequency increased in dry/windy conditions and in winter months when PM is typically highest (DoE, 2024); (iii) Stockpile and materials management: Cover or wet down fine aggregates/soil stockpiles; minimize stockpile height; locate stockpiles away from sensitive receptors; keep cement and fine powders in covered/contained storage.

Traffic Congestion

Impacts. The site is characterized by industries and high traffic volume. The proposed site adjunct to internal campus roads. Given the main road's traffic volume, it is expected that during peak construction time when heavy vehicles and machineries will be transported at full scale, the extra traffic movement will disrupt the normal traffic at a moderate significance. The traffic plan needs to be devised before construction goes onboard.

Mitigation. A traffic management plan (TMP) must be devised prior to construction and approved by the environmental specialist from SDCMU and approved from local zilla parishad/police station. A sample TMP has been attached with this IEE as Appendix 4.

Noise and vibration

Impacts. Construction of the BUTEX Executive Development Centre (EDC) will increase noise and potentially ground-borne vibration due to excavation and basement works, concrete pouring, material handling, operation of generators/compressors, and increased truck movements. These impacts are important in a university setting because classrooms, offices, libraries, exam halls and other learning spaces function as sensitive receptors and may fall under the “silent zone” intent of Bangladesh’s Noise Pollution (Control) Rules, 2006 for educational premises and their surrounding buffer (Noise Pollution (Control) Rules, 2006).

Typical sources include breakers/hammers, batching/compaction equipment, generators, and reversing alarms. If unmanaged, construction activities can cause (i) annoyance and speech interference during teaching, (ii) reduced concentration during examinations, and (iii) increased complaints. Vibration risks arise where activities such as heavy compaction, vibratory rollers, and (if any) piling transmit energy through the ground to nearby structures, potentially causing perceptible vibration and minor cosmetic impacts (e.g., cracking of plaster) even when structural damage thresholds are not reached. These risks increase if high-noise/high-vibration tasks overlap with peak academic hours and exams, or if plant is poorly maintained.

Mitigation. Construction shall be managed so that noise levels at sensitive receptors do not exceed applicable limits under the Noise Pollution (Control) Rules, 2006, and so that night-time disturbance is avoided unless specifically authorized. (Government of Bangladesh, 2006). To minimize both noise and vibration: (i) construction should be limited to daylight working hours as the default; (ii) all construction machinery and haul trucks must be maintained in good condition and fitted with effective mufflers/silencers; and (iii) equipment causing excessive vibration must not be used near sensitive structures without controls and monitoring.

Occupational health and safety

Impacts: Construction activity and construction sites carry inherent risks for workers. These risks include falls, contact with moving machinery, flying and falling objects, dust, burns, cuts, exposure to intense light from arc welding, electric shock and electrocution, and crushing from collapsing earth walls, amongst other things. Where construction is conducted in public rights-of-way, there are also dangers associated with vehicles moving past the work site.

Mitigation. Risks to worker safety on the job site can be successfully minimized though proper worker training, and by strict use of task-appropriate personal protective equipment (PPE). All workers and site supervisors should be provided workplace safety training prior to the start of construction, and at regular intervals thereafter. Training should be repeated whenever new crews are brought on to the site, and whenever monitoring by the primary Contractor or construction supervision consultant reveals declining standards of practice on the site. The primary Contractor

should ensure that all workers are provided with adequate PPE suited to any task they may be given, and also strictly enforce its use at all times.

Construction waste

Impacts. Waste generated during construction will consist mainly of packaging, from both construction materials and food products consumed by workers. The volume of waste produced is likely to be relatively small but can easily get strewn and blown across the landscape and end up in local water bodies, if not appropriately managed.

Mitigation. Suitable receptacles should be positioned at strategic locations around the work sites to facilitate containment and collection of solid waste. Construction waste should be sorted to segregate recyclables, and regular pickup of these by a local recycling business should be arranged. Non-recyclable waste should be transported to the nearest legal landfill site, and never burned, buried or dumped on the site. Waste oil and other noxious fluids and associated used containers should be recycled through a reputable business providing this service. The primary Contractor should be required to specify all waste management arrangements - including the identity of recycling enterprises and legal landfill operators able to accept expected wastes - in a site-specific Waste Management Plan embedded within the CEMP. Appropriate contents of a Waste Management Plan are specified in the sample CEMP outline provided in Appendix 9.

Cumulative Impact Assessment

1. 236. The Cumulative Environmental Impact Assessment (CEIA) for the proposed Executive Development Centre (EDC) at BUTEX considers the combined and interacting effects of (i) the EDC construction/operation, (ii) concurrent or pipeline campus development activities managed through BUTEX planning/procurement processes, and (iii) wider area-level urban infrastructure and redevelopment pressures in Tejgaon Industrial Area. Together, these can amplify pressures on mobility and access, ambient air/noise conditions, drainage and waterlogging risks, utility reliability, waste handling capacity, and overall campus user experience beyond the EDC's standalone effects. This cumulative framing is especially relevant because Tejgaon is undergoing rapid transition with intensified construction activity and land-use change, which can raise "background" levels of dust, noise, traffic disruptions, and service constraints.

237. At campus scale, BUTEX has an institutional planning and development function and publishes annual procurement planning information, indicating an ongoing pipeline of works and services that may overlap temporally with EDC phases. At city/area scale, major transport and urban-water systems that influence Tejgaon mobility and drainage performance—including the Dhaka Elevated Expressway corridor and the Hatirjheel–Begunbari Khal system—create additional cumulative interactions through construction staging, traffic diversions, and stormwater routing constraints.

PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

Consultation with officials of the Finance Department, MoF

Consultations with the Finance Department, Ministry of Finance took place in November 2024 at SDCMU established under SEIP. The Project Director (PD) of SEIP who is in charge of SICIP, officials from Finance Department relevant to the project and ADB project team attended the meeting and discussed various aspects of the proposed EDC BUTEX building and possible safeguards system. Discussions on possible 'green building' components and locations of establishment of the EDC BUTEX building were held.

Consultation with the BUTEX teachers, students and surrounding residents. During the time of field visit to BUTEX (January 2025) the technical assistance team sat with the teachers, students and surrounding residents and talked to them informally. Discussions took place in various places on the BUTEX campus. The discussions took place on various educational issues, as well as campus environmental issues.

Table: Summary of the point of discussions with BUTEX teachers and officials

Environment-related discussions and questions	Summary points, discussions and decisions (BUTEX EDC)
Green building integration and campus microclimate	**Key concerns raised:** Heat stress in Dhaka, discomfort in corridors and waiting areas, and the need for shade and greenery around entrances and pedestrian approaches. **Decision/commitment:** Integrate feasible green elements (shade trees, planters, courtyard/edge greening, reflective/low-heat surfaces) that reduce heat gain and improve comfort. **Action items:** (i) Include a landscape/greening plan aligned with campus maintenance capacity; (ii) protect existing trees where possible; (iii) prioritize shading along main pedestrian desire-lines and near building entries.
Natural ventilation and indoor air quality (IAQ)	**Key concerns raised:** Desire to minimize over-reliance on AC while ensuring comfortable training/meeting spaces; concerns about dust infiltration during construction and early operation. **Decision/commitment:** Apply climate-responsive ventilation design (cross-ventilation where feasible, fresh air provision, filtration where required) consistent with Dhaka conditions. **Action items:** (i) Confirm ventilation strategy in detailed design (natural + mechanical hybrid as needed); (ii) define IAQ protections during fit-out (duct protection, filter replacement before occupancy); (iii) specify low-VOC finishes for occupied spaces.
Energy efficiency and solar heat management	**Key concerns raised:** High electricity costs and load-shedding risks; need for lower cooling demand in training rooms. **Decision/commitment:** Prioritize passive solar control (shading, façade treatment, glazing strategy) and high-efficiency equipment. **Action items:** (i) Optimize shading devices/overhangs and glare control; (ii) specify efficient lighting and controls; (iii) assess rooftop solar feasibility subject to structural and roof-use constraints.
Sustainable material selection and sourcing	**Key concerns raised:** Interest in low-impact materials but concern about cost premiums and availability. **Decision/commitment:** Use a "best feasible" approach: local sourcing where possible, recycled content where practical, and durability-focused specifications to reduce life-cycle impacts. **Action items:** (i) Develop a procurement checklist for low-VOC materials, certified timber (if used), recycled steel where feasible; (ii) avoid materials with high maintenance burden; (iii) require supplier documentation for key materials.
Construction-phase environmental management (dust, noise, housekeeping)	**Key concerns raised:** Dust and noise impacts on teaching/training; disturbance during exams; complaints often arise when contractors do not enforce good housekeeping. **Decision/commitment:** Adopt prevention-first construction controls with clear contractor obligations and supervision. **Action items:** (i) Site-specific Dust Management Plan (watering, covered stockpiles, covered trucks, track-out control); (ii) Noise & Vibration Management Plan with exam/peak-hour restrictions; (iii) daily housekeeping and drain protection routine; (iv) monitoring and corrective action triggers.

Environment-related discussions and questions	Summary points, discussions and decisions (BUTEX EDC)
Traffic management and pedestrian safety (campus interface)	**Key concerns raised:** Safety at the site interface and along approach roads during deliveries; need for protected walking paths for students/staff. **Decision/commitment:** Prepare and enforce a Traffic/Transport Management Plan (TTMP) suitable for an active campus. **Action items:** (i) Delivery scheduling (off-peak windows); (ii) trained flaggers at entry/exit; (iii) speed limits and no-idling; (iv) protected pedestrian routes and crossings; (v) maintain emergency access at all times.

GRIEVANCE REDRESS MECHANISM

A well-defined grievance redress and resolution mechanism will be established to resolve grievances and complaints in a timely and satisfactory manner. All affected persons will be made fully aware of their rights, and the detailed grievance redress procedures will be publicized through an effective public information campaign. The grievance redress process includes three levels:
First level of GRM: The first level and most accessible and immediate contact for the fastest resolve of grievances are the Contractors, with assistance from Design Supervision Consultants (DSC) on site. Prior to construction of any works, the PIU will ensure local community meetings are held to notify residents and businesses of any temporary disturbances, and to inform them of the Project and the GRM. If any complaints arise, the Contractors, with assistance from DSC can immediately resolve the complaint on site. The Contractor's and DSC's office phone number will be posted in public areas within the subproject areas and construction sites. Any person with a grievance related to the project work can contact the project to file a complaint. The Contractor may seek the assistance of the DSC safeguards specialists (the environmental specialist or social safeguards specialist) to resolve the issue. The DSC safeguards (environment and resettlement) focal person will immediately address and resolve the issue with the Contractor within 1-2 days, if the complaint remains unresolved at the field level. The PIU safeguards focal person will fully document the following information: (i) name of the person; (ii) date complaint was received; (iii) nature of complaint; (iv) location, and (v) how the complaint was resolved.

Second level of GRM: Should the grievance remain unresolved; the Contractor with assistance from DSC will forward the complaint to the PIU safeguards focal person. The person filing the grievance will be notified by DSC safeguards focal person that the grievance was forwarded to the PIU safeguards focal person. The PIU will address the grievance. Grievances will be resolved through continuous interactions with affected persons, and the PIU will answer queries and resolve grievances regarding various issues including environmental or social impacts. Corrective measures will be undertaken at the field level by the PIU safeguards focal person within 7 days. He/she will fully document the following information: (i) name of the person; (ii) date the complaint was received; (iii) nature of complaint; (iv) location and (v) how the complaint was resolved.

Third level of GRM: Should the grievance remain unresolved, the PIU's project director will activate the third level of the GRM by referring the issue (with written documentation) to a Grievance Redress Committee (GRC), which will, based on review of the grievances, address them in consultation with the PIU, Contractor, DSC, and affected persons. The GRC will consist of TMED/IA representative as chairperson, and other relevant stakeholders. A meeting will be

called with the GRC, if necessary, where the affected person can present his/her concern and issues. The process will promote conflict resolution through mediation. The GRC will meet as necessary when there are grievances to be addressed. The GRC will suggest corrective measures at the field level and assign clear responsibilities for implementing its decision within 15 days. The functions of the GRC are as follows: (i) to provide support to affected persons on problems arising from environmental or social disruption, asset acquisition (where required), and eligibility for entitlements, compensation, and assistance; (ii) to record grievances of affected persons, categorize and prioritize them, and provide solutions within 15 days; and (iii) to report to the aggrieved parties' developments regarding their grievances and decisions of the GRC. The TMED/IA safeguards focal person will be responsible for processing and placing all papers before the GRC, recording decisions, issuing minutes of the meetings, and taking follow-up action to see that formal orders are issued, and the decisions carried out.

Access to Country's legal system. An aggrieved person shall have access to the country's legal system at any stage, and accessing the country's legal system can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM

Grievance Redress Mechanism for Workers

An additional mechanism shall be set up by the SOU to accept and address complaints from workers employed in the construction works, concerning working conditions, living conditions in construction camps, safety and health issues, labor rights violations, mistreatment, or any other matter. All laborers, skilled workers, and site engineers employed on site by the primary Contractor or by any of its sub-Contractors shall have access to the mechanism. All workers will receive an orientation to the workers' GRM during pre-construction induction training. Workers will be able to lodge grievances with on-site personnel of the CSC, who will record the complainant's name, position, employer, and contact information, as well as a description of the complaint and the time, date and place at which the complaint was reported. The CSC will inform the SOU, which will record the grievance in a grievance register. The CSC will convene a meeting of the complainant or complainants, the sub-Contractor involved, the Primary Contractor, and any labor syndicate to which the complainant(s) may belong, in an effort to decide on an appropriate resolution of the complaint.

ENVIRONMENTAL MANAGEMENT PLAN

The EMP for the project defines mitigation and monitoring measures and identifies the institutions, responsibilities and mechanisms that will ensure their implementation. Such institutions and mechanisms will seek to ensure continuous improvement of environmental protection activities during the pre-construction, construction, and operation phases of the project, in order to manage adverse impacts.

Responsibilities in EMP Implementation

Each of the entities identified above has multiple responsibilities, the fulfilment of which is required for full and effective implementation of the EMP. These responsibilities are detailed in Table below.

Table: EMP implementation responsibilities

Entity	Responsibilities in EMP Implementation
Skills Development Coordination and Management Unit (SDCMU)	• Prepare operations and maintenance procedures for facilities under construction, ensuring their compliance with the EMP • Work with the SOU to train facility personnel on EHS aspects of facility operation in advance of commissioning, to ensure effective EMP implementation during the operation period
Project Implementation Unit (PIU) at BUTEX	• Ensure that EMP implementation is recognized as a critical element of overall project implementation • Enable and adequately staff SOU • Oversee rigorous review of bids and prioritize selection of Contractors with strong environmental compliance track records • Coordinate with SDCMU as needed to ensure smooth implementation of EMP
Safeguards Oversight Unit (SOU) under SDCMU	• Ensure EMP provisions are fully reflected in civil works bid documents • Advise and support PIU on Contractor selection and other procurement decisions • Guide and support ESFP and EHSOs to ensure timely and competent execution of site-level oversight activity • Collect and collate progress reports and environmental monitoring reports for each location to assemble comprehensive quarterly monitoring reports for submission to ADB. • Work with CSCs and primary Contractors to develop and deliver periodic EHS training for sub-Contractors and their workers • Work with CSCs to train facility managers or their EHS personnel in advance of commissioning, to ensure effective EMP implementation during the operation period • Administer the GRM • Support PMUs in obtaining environmental clearances and renewals
Environmental Safeguards Focal Person (ESFP) under SDCMU	• Oversee the safeguards compliance process for all Investment Project sites under the PMU's control, liaising with the PIU-appointed Project Manager and with support from SOU and EHSO • Prepare and submit quarterly progress reports for the sites owned by their home agencies to the PIU and SOU • Chair LGRC when needed to address Level 2 grievances regarding project implementation activities
Environmental coordinator/manager at BUTEX	• Oversee the safeguards compliance process for the investment site at BUTEX • Liaison with the ESFP for monthly report and day-to-day update • Supervise the EHSO
Environment, Health and Safety Officer (EHSO)	• Conduct regular monitoring of conditions on site, including compliance with prescribed mitigation strategies, and submit EHS monitoring reports on a monthly basis to the Environmental Coordinator at PIU • Identify worker training needs and support SOU and CSC in development and delivery of training
Construction Supervision Consultants (CSC)	• Review and approve CEMPs and quarterly environmental monitoring reports submitted by Contractors • Guide and assist PMUs, through ESFPs, in monitoring of CEMP implementation and site conditions, including preparation of quarterly progress reports for submission to SOU • Direct and supervise corrective action by Contractors as needed • Collaborate with SOU on development of safeguards training for sub-Contractors and workers

Entity	Responsibilities in EMP Implementation
Contractors	• Prepare and implement CEMP for each site, based on EMP prescriptions and international best practices • Conduct quarterly EHS monitoring on all sites under their control and submit quarterly monitoring reports to CSC for review • Implement corrective actions as directed by CSC and/or ESFP
Department of Environment (DOE)	• Review environmental clearance applications, including IEE and EMP • Review annual environmental monitoring reports submitted by SOU during construction phase • Review applications for environmental clearance renewals
ADB	• Review and approve IEE and EMP • Publicly disclose IEE on ADB website • Review quarterly environmental monitoring reports prepared by PMU and publicly disclose them on ADB website

Environmental Impacts and Prescribed Mitigation and Enhancement Measures

The findings of the environmental impact analysis are presented in Section VI of the IEE report. The potential impacts and corresponding measures that are prescribed in order to mitigate the negative impacts or enhance positive ones are collected in Table IX 3. The measures prescribed apply to the pre-construction, construction and operations phases of the infrastructure development at the BUTEX site. All measures listed in Table IX 3 are requirements, based on the infrastructure plan as proposed at the time of preparation, whose fulfillment is assigned. All measures assigned to Contractors should be reflected in bidding documents, and serve as the basis for the CEMPs, which must be prepared to cover all sites at this investment location.

Environmental Monitoring and Reporting

Environmental monitoring consists of assessing both the degree to which Contractors and facility operators are fulfilling their responsibilities to implement measures specified in the EMP to manage impacts (compliance monitoring), and the degree to which their impact management efforts are successful in preventing harmful environmental conditions from arising (effects monitoring). Compliance monitoring typically makes use of checklists to confirm or disconfirm that prescribed measures are being properly implemented, while effects monitoring involves quantitative and/or qualitative sampling at designated locations. Both types of monitoring need to be conducted on a regular and consistent basis, to ensure comparability of results across monitoring periods. Monitoring should begin before site clearing, so an environmental baseline (i.e., pre-project conditions) can be established for key environmental parameters.

Monitoring parameters for each prescribed mitigation and enhancement measure are identified in Table IX 3. Specific monitoring responsibilities, including the monitoring and reporting timetable for each, are detailed in Table IX 4.

As will be noted from the preceding table and figures, several entities are expected to submit regular monitoring reports as a fundamental contribution to effective implementation of the EMP. These reporting processes are summarized in Table IX 5 for clarity. A sample outline of a semi-

annual monitoring report as must be prepared by the SOU for submission to ADB (which can also be adapted for quarterly monitoring reports as must be prepared for DOE) is provided in Appendix 18.

Institutional strengthening and training requirements

A capacity building program for EHS units within SDCMU and BUTEX should be developed and delivered in the interval between the project's approval and the end of construction on the first round of investments. The capacity development program should aim to establish stable, sustainable EHS units capable of (i) proactively and professionally driving compliance with national and multilateral-mandated environmental clearance and environmental assessment requirements in relation to proposed, under-construction and operational infrastructure investments; (ii) collaborating productively with specialists hired under the auspices of major investment projects; (iii) carrying out long-term EHS monitoring for all agency facilities; and (iv) building a culture of sustainability and safety across their home agencies through awareness-raising and educational campaigns.

Capacity investments should include support for hiring and resourcing adequate staff commensurate with the needs of the agency, and staff training. The capacity building program should include the following elements: (i) needs assessment; (ii) capacity-building plan including recommendations for staffing and resources; and (iii) training program for each EA's EHS unit. Design, development and delivery of the capacity building program is appropriately included in the mandate of the CSC engaged to oversee implementation of the project works. The CSC should be supported in this work by the SOU, and the ESPFs of SDCMU and BUTEX.

EMP Implementation cost

Cost estimates for mitigation measures, environmental monitoring, public consultations, and capacity building are summarized in Table IX 8. Contractors will bear the direct costs of all mitigation measures during construction, which will be included in the tender and contract documents; this includes features built into facility designs in order to prevent environmental impacts from arising. The MoF SDCMU and BUTEX will bear the costs related to mitigation measures during operation. Costs related to environmental supervision during construction will be borne by the SDCMU (for hiring a licensed laboratory to conduct quarterly monitoring), the PMU (for the activities of the environmental consultants) and by the contractors (for monitoring work carried out by the EHSOs). During the operation phase and monitoring costs will be borne by the SDCMU and BUTEX (for regular monitoring activity of their site EHSOs). The EMP cost shall be included in the BOQ as a provisional sum (non-competitive) item.

CONCLUSION AND RECOMMENDATION

This IEE has been prepared for the proposed Executive Development Centre (EDC) building at Bangladesh University of Textiles (BUTEX) based on (i) desktop review of available project information and applicable national requirements, (ii) field reconnaissance of the proposed site and the surrounding campus environment, and (iii) consultations with relevant institutional

stakeholders and representatives of the public within the project's area of influence. The assessment considers the environmental, occupational health and safety, and community health and safety impacts that may reasonably occur during pre-construction, construction, and operation. The Environmental Management Plan (EMP) has been developed in accordance with ADB's Safeguards Policy Statement (SPS, 2009) and applicable Department of Environment (DoE) requirements, and aligns with recognized international good practice, including the World Bank Group EHS Guidelines.

The monitoring plan, if properly implemented during the pre-construction, construction and post-construction and operation phases will ensure taking corrective measures. The proposed project will have no residual adverse impact on the environment or the eco-system if mitigation measures are properly followed. MoF and BUTEX are required to take clearance from the DoE for implementing the construction works and other ancillary works. The IEE report has been prepared with this end in view.

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I. INTRODUCTION

A. Background

1. Aligned with the Bangladesh country partnership strategy 2021−2025 and broader Bangladesh Government Program "Human capital enhanced for sustainable economic development and inclusive growth", the proposed Result Based Lending (RBL) Program 'Skills for Industry Competitiveness and Innovation Program (SICIP)' will increase provision of skilled workforce for industry competitiveness and innovation. The key major outputs of the envisaged for the RBL program are: (i) Training for advanced technical skills in priority and emerging sectors improved; (ii) Managerial capabilities and green innovation capacity strengthened; (iii) Socially inclusive skilling and upskilling expanded; and (iv) Institutional capacity for skills monitoring and management enhanced. The Result Based Lending (RBL) contributes to ADB's Strategy 2030 operational priorities: (i) addressing remaining poverty and reducing inequalities; (ii) accelerating progress in gender equality; (iii) tackling climate change, and building climate and disaster resilience, and enhancing environmental sustainability; and (iv) strengthening governance and institutional capacity. The program is included in the Bangladesh indicative country pipeline and monitoring 2023−2025.

2. The country's priority industries for growth continue to center on ready-made garments (RMG), textiles, light engineering, leather goods and footwear, information technology (IT), construction, etc. as identified under the ongoing Skills for Employment Investment Program (SEIP). With rapid technological advances such as IR 4.0, skills requirements in these priority industries are evolving quickly. While major industries like RMG and textile sectors account for more than 80% of the country's exports, these industries still occupy the low-end of the global value chain. To move up the global value chain, skilled workforce equipped with technological capabilities is becoming crucial to produce value-added goods and services. The RBL program will support the Ministry of Finance (MOF) strategic framework by financing the implementation of selective interventions, in coordination with other development partners.

B. The project

1. Project aim

3. The impact of the program is aligned with increased technology-ready workforce for diversified and innovation-driven economy. The outcome will be equitable access to skills training in priority and emerging industries expanded across skill levels. The outcome will be measured by (i) the number of men and women trained from basic to advanced skill levels in priority industries; (ii) share of trainees placed in jobs within 6 months of training completion; and (iii) number of skills courses implemented specifically for women across skill levels. The program is expected to benefit at least 250,000 men and women over 5-year implementation.

2. Outputs and outcomes of SICIP

4. The indicative outputs of the proposed RBL are:

5. **Output 1: Training for advanced technical skills improved.** This output will cultivate higher-level technical skills for existing priority and newly emerging sectors, through partnerships between industries and education/training institutes. The skill requirements will be identified by leading industries, particularly for high-demand technology-related skills. Industries will be

involved in developing the curriculum and instructors as well. The Finance Division is setting up an Industry Advisory Board consisting of leading industries to advise on the program. Some polytechnics—including women polytechnics—in industrial areas will be converted into specialized polytechnics to offer customized skills courses for emerging industries (e.g., automobiles, electronics)[1]. This output will also enhance the institutional capacity to produce skilled workers adept at emerging technologies including green technologies, by establishing smart textile technology living labs (NATIs) in two textile engineering colleges[2], setting up high-demand technology-based courses in garments universities, and delivering higher-level technical courses in a renovated light engineering institute. All these technical courses will have international partnerships for transfer of knowledge and training of instructors[3].

6. **Output 2: Managerial capabilities and green innovation capacity strengthened.** Building on SEIP's introduction of Executive Development Centers (EDCs) that impart customized mid-level managerial training through university-industry partnerships, the government will further institutionalize the EDCs in partnering universities (e.g., Dhaka University, BRAC University, East West University, and Bangladesh University of Textiles)[4]. EDC courses will be updated to align with industry's technology trends and global environmental standards, including green technologies and business practices. This output will also support selected universities to promote applied R&D for industry solutions, especially small and medium enterprises (SMEs), as well as incubation opportunities. R&D activities to help SMEs develop climate resilient products or services will be prioritized. The government will bring overseas scientists and engineers of Bangladesh origin to contribute to the transfer of knowledge and skills, while connecting local industries and academies to the global network.

7. **Output 3: Socially inclusive skilling and upskilling expanded.** This output will continue to support basic- and mid-level skills training of new entrants or existing workers, following on SEIP's sector-focused skills training models. These programs will be implemented in close coordination with the National Skills Development Authority (NSDA) and the National Human Resource Development Fund (NHRDF). It will also create specially targeted skills programs for socially disadvantaged groups (e.g., people with disabilities, minorities, other marginalized groups), women garment sector workers who are at high risk of job loss due to automation, and those who may be negatively affected by transition to low-carbon economy. For women, upskilling and multi-skilling for future garment work or alternative livelihoods, community-based support for empowerment, and green entrepreneurship skills will be provided in partnership with the H&M Foundation and the Asia Foundation. The government will also expand skills courses with international certification, which enable Bangladesh migrant workers to gain better employment opportunities overseas and increase remittance flows.

8. **Output 4: Institutional capacity for skills monitoring and management enhanced.** This output will support the capacity development of core skill systems such as NSDA and NHRDF for the future sustainability of skills initiatives and partnership modalities. It will also support the functioning of a new Industry Advisory Board for output 1 activities. The output will continue

[1] A polytechnic in Narsingdi, where automobile production plant is being established, will become a specialized center of excellence for automotive technical skills. Another women's polytechnic is being planned for skills in electronics.
[2] Smart textile technology labs (NATIs) provide hands-on learning environments with technology applications, from yarn manufacturing to fabric/garments production, using global standards in testing and production. It aims to strengthen capabilities of textile industry workforce and promote R&D, especially in manmade fabrics
[3] International partnerships include Hanyang University and the Korea Institute of Textiles for NATIs; the Fashion Institute of Technology in New York for the Bangladesh University of Fashion and Technology; and the Korea University of Technology and Education for the Bangladesh Industrial Technical Assistance Center.
[4] The current EDCs focus on the following four industries: garments, textiles, knitwear, leather goods and footwear.

enhancing monitoring mechanisms, such as the trainee management system (TMS) created under SEIP to monitor training and track its outcomes. Analytic studies, such as a tracer study and industry skills trends analysis, will be undertaken to assess the effectiveness of new skills programs and to build effective training partnership models. The output will ensure effective management and governance of skills development systems overall.

9. **ADB's value addition.** ADB has been a trusted partner for nationwide skills programs with an innovative approach in public-private training partnerships. In the proposed RBL, ADB adds value in: (i) expanding training partnerships to advanced-level, technology-oriented skills, including customized training for emerging industries to support economic diversification; (ii) reorienting existing polytechnics and universities with strong industry linkages; (iii) facilitating international partnerships to develop stronger institutional capacity for skills in emerging IR4.0 and green technologies for climate resilient, green growth; (iv) strengthening gender and social inclusion dimensions with dedicated skills programs, including for those at risk of job loss due to low-carbon economy transition; (iv) strengthening the broader government program with innovative results-oriented program designs; and (v) bringing ADB's expertise with international good practices. The RBL program builds on the ongoing SEIP and complements ADB-financed TVET Teachers for the Future Program and other skills projects by the World Bank.

C. Project interventions

10. Under Output 1 the proposed RBL program aims to cultivate higher-level technical skills and enhance institutional capacity to produce skilled workers to adept with emerging technologies including green technologies. To achieve this aim, under current scope, the RBL program will construct/establish smart textile technology living labs (STTLs) in two textile engineering colleges (Bangabandhu Textile Engineering College in Tangail and Chittagong Textile Engineering College in Chattogram[5]), Narsingdi Auto-Tech Training Institute (NATI) at Narshingdi Polytechnic Institute (NPI) and construct one academic building (12 story, Executive Development Center - EDC) in the East West University. In addition, extension of classrooms and some renovation work will be carried out at the Institute of Business Administration (IBA), Dhaka University.

11. Additionally, civil work of Kumudini Nursing dormitory at Tangail, which commenced during the implementation of SEIP, will be taken over by SICIP. There are also a few scopes of civil works under SICIP under consideration but to be finalized. The scopes are following:

(i) Automotive training at Narsingdi Auto-Tech Training Institute (NATI) at Narsingdi Polytechnic Institute, Narsingdi (i.e., a. new three storied building; b. one storied vertical extension of north block; c. vertical & horizontal extension of south block)
(ii) Kumudini academic building at Tangail – site is identified but the scope of work soon to be identified (ground floor building vs. 3 story building)
(iii) At 1-2 universities or polytechnics, training centers may be established; the land yet to be identified.

12. 1-2 small upgrading works may be supported during implementation.

[5] Bangladesh Government Gazette notification to change the name of five district is effective from 10. September. 2018. The names were changed to be consistent with their original Bangla spelling. However, despite of the name changes of the 5 districts, the associated college name was not changed.

D. Implementation arrangement

13. The Finance Division in MOF will be the executive and implementing agency. The Skills Development Coordination and Management Unit (SDCMU)—established under SEIP—will continue to serve as the program management unit to facilitate, coordinate, and monitor all project activities. The key implementing partner agencies include the Technical and Madrasa Education Division in the Ministry of Education; Ministry of Expatriate Welfare and Overseas Employment; Ministry of Industries; and Ministry of Textiles and Jute (MoTJ). An inter-ministerial project

Figure I-1 Locations of the proposed structural investments under SICIP.

steering committee, chaired by the Secretary of Finance Division, will provide overall policy advice and oversight, approval of annual operation plans, review of achievements against targets, and ensuring compliance with fiduciary oversight arrangements.

E. The Initial Environmental Examination (IEE)

14. This Initial Environmental Examination (IEE) has been prepared, in accordance with the environmental assessment requirements of the Asian Development Bank (ADB) and the Government of Bangladesh, as well as the guidance provided by the EARF developed for guiding the environmental safeguards principles adopted for SICIP, to help ensure that the infrastructure proposed under the Investment Project part of the Program meets a high standard for environmental and social responsibility. As proposed investments are dispersed across many locations within Bangladesh, it is considered appropriate for each location to be covered by a context-specific IEE. **This IEE report is applicable to "Construction of Proposed 12 Storied - Executive Development Centre (EDC) For Bangladesh University of Textiles (BUTEX), Dhaka"**.

15. The findings presented in the IEE report are based on desktop studies; discussions with BUTEX teachers, Detailed engineering and architectural designs, local knowledge of the consultants engaged in this project; visits to BUTEX and the surrounding area; and consultations with local stakeholders in January 2026.

1. Objective, purpose and limitations of this report

16. This report describes the assessment results of environmental and social impacts caused by the subprojects as described in para. 11-12 which are likely to be categorized as Orange (building construction and repairs/retrofitting) according to the Environmental Conservation Rules (ECR) 2023 adopted by the Bangladesh Government and specifies measures to address such impacts. The project is categorized as Category B as per ADB SPS 2009. This IEE is based on the Environmental Assessment and Review Framework (EARF) prepared during the ADB preparatory site visits in 2022/23 that focused on all subprojects. This IEE is developed based on the subproject site plans and information obtained during the field visits conducted by the environmental consultant; and secondary data, which characterize the environment and identify potential impacts. It contains the results of interviews and consultations with stakeholders in January 2026. The IEE includes an environmental management plan (EMP) outlining mitigation measures and monitoring requirements.

17. Detailed design of subprojects is still ongoing, which therefore is not reflected in the IEE. Environmental specifications will be included in procurement documents to support integration of provisions into construction.

2. Scope

18. The scope of the report covers the existing environmental condition in the project site, assessment of potential environmental impacts during design and/or pre-construction, construction, and operation stages; description of the environmental management plan (EMP) and environmental monitoring plan; stakeholders' consultation, grievance redress mechanism, and description of the legal and administrative framework. This IEE does not provide assessment for any other/future developments or activities at the location or anywhere else within the area concern reported in this IEE document. Should any further development be planned as a result of either this Project or other related works, additional planning and assessment following the requirements of the government will be carried out separately.

19. In general, this IEE intends to:

(i) Examine and describe the existing status of the various ecological, physical and human related components surrounding the project area;
(ii) Predict the potential significant impacts of the project on the surrounding environment during the pre-construction, construction, operations and maintenance stages, and recommend appropriate mitigation and abatement measures; and,
(iii) Identify residual impacts of the project and recommend appropriate short-term and long-term management plans.

3. Structure of this IEE report

20. The structure of this report follows the general guidelines of the Environmental Assessment and Review Framework (EARF) developed for SICIP. The structure of this report maintains the following sequence:

Executive Summary

Chapter 1 Introduction provides the background on the project, the project's impacts and expected outcomes, administrative structure of the project, purpose and limitation of this report.

Chapter 2 Legal and Policy Framework presents a review of relevant national laws and policies, international environmental obligations, ADB's environmental requirements, procedure of environmental clearance, environmental categorization.

Chapter 3 Description of the Proposed Infrastructures provides a brief description of the Project, the location, size and need, description of project components.

Chapter 4 Description of the Environment includes details on the baseline data of the environmental conditions in the project area (current features and conditions)

Chapter 5 Analysis of Alternatives presents the alternatives considered during the feasibility study in order to arrive at the best option.

Chapter 6 Anticipated Environmental Impacts and Mitigation Measures identifies the potential environmental, economic and social impacts from pre-construction, construction, and operation phase.

Chapter 7 Public Consultation and Information Disclosure discusses the issues raised during the consultations, proposed actions to address them, and the information needed to be disclosed to the public.

Chapter 8 Grievance Redress Mechanism describes the process of addressing complaints.

Chapter 9 Environmental Monitoring Plan outlines the environmental monitoring program, institutional responsibilities including the cost of implementing the EMP.

Chapter 10 Conclusion and Recommendation

Appendices

II. LEGAL AND POLICY FRAMEWORK

A. Introduction

21. This section of the IEE details the Administrative Framework for the Project, covering national requirements as well as applicable international treaties and conventions. The intent of this section is to lay out the regulatory and non-regulatory performance requirements for all stages of the Project. For the purposes of this report, only those regulatory elements directly relevant to the proposed Project will be discussed. The environmental assessment requirements of both the Government of Bangladesh and ADB are outlined as well.

B. Institutional framework

22. The lead environmental agency in Bangladesh is the Department of Environment (DOE), under the Ministry of Environment, Forests and Climate Change (MOEFCC). DOE is charged with furthering environmental conservation, improvement of environmental standards, and control and mitigation of environmental pollution. This mandate positions DOE as a key regulator of a broad range of developments in the infrastructure, industrial and commercial sectors, including both publicly and privately funded initiatives. DOE is responsible for administering the country's central environmental law, which provides the framework for environmental impact assessment.

23. Other agencies with important environmental mandates include the Bangladesh Forests Department (also under MOEFCC), the Ministry of Water Resources, the Ministry of Fisheries, and the Ministry of Land. The laws and regulations administered and enforced by these other agencies do not structure the environmental assessment process directly but may often come into play in the consideration of the suitability and permissibility of proposed infrastructure developments by DOE.

24. Occupational health and safety are key considerations of the environmental assessment of proposed infrastructure. The Ministry of Labour and Employment (MoLE), particularly its Department of Labour and Department of Factory and Establishment Inspection, is of direct relevance to the environmental assessment process, as it administers and enforces the country's legislation, rules and standards governing industrial workplaces, including construction sites and most industrial facilities where physical labour is undertaken.

C. National policies, laws and rules applicable to the project

1. Central policy instruments

a. National Environmental policy 1992 (revised in 2018)

25. Bangladesh adopted the National Environmental Policy (NEP) in 1992 to chart a path towards the country's sustainable development. The NEP 2018 is a revision of the NEP 1992 in the context of the new reality of climate change. The NEP 2018 also outlines a more up to date understanding of the extent and magnitude of environmental degradation that has become a fact of life in the world in general, and in Bangladesh in particular. The NEP 2018 outlines the problems of population growth, poverty, illiteracy, lack of awareness and healthcare services, limitation of arable land, unplanned development and urbanization, and industrialization as the major impediments to the conservation of the environment. The NEP sets out the basic framework for

environmental action together with a set of broad sectoral guidelines for action. Major elements of the policy are:

(i) maintaining the ecological balance for ensuring sustainable development;
(ii) protection against natural disasters;
(iii) identifying and controlling activities which are polluting and/or destroying the environment;
(iv) ensuring environment-friendly development in all sectors;
(v) promoting sustainable and sound management of natural resources; and
(vi) active collaboration with international initiatives related to the environment.

26. The NEP, amongst other aims, seeks to ensure that transport systems, including roads and inland water transport, do not pollute the environment or degrade resources. The policy states that environmental impact assessment should be conducted before projects are undertaken. The NEP 2018 includes additional elements addressing climate change mitigation and adaptation as key environmental issues facing the country and integrating a comprehensive 3R approach to the massive and growing problem of industrial and household waste that has swelled along with the country's urbanization.

27. Following are the key subject matters covered under the National Environment Policy, 2018:

(i) Ensuring sustainable development through reducing human pressure on nature and natural resources;
(ii) Considering environment protection as integral part of the development programs planned to meet the need of the present and future generation;
(iii) Making natural resources extraction, use, environmental conservation etc. to be based on science;
(iv) Considering environmental impacts and risks in extracting and using natural resources;
(v) Evaluating economic contribution of ecosystem services simultaneously to that of natural resources;
(vi) Giving priority to poor and under privileged group of people in order to ensure their participation, equity, justice, accessibility to the use of natural resources and getting ecosystem services on which, they are dependent;
(vii) Taking initiatives to prevent misuse and ensure optimum of water, land, natural gas and other natural resources in the production process as well as day-to-day purposes;
(viii) Encouraging sustainable use of new and renewable resources;
(ix) Enhancing long term poverty alleviation and food security through conserving biological diversity;
(x) Realizing compensation from persons and institutes those who are liable to environmental pollution through applying polluter pay principle;
(xi) Including environmental conservation and preservation in all national policies and ensuring implementation of the environment policy at both government and non-government level;
(xii) Giving priority to preventive measures over curative measures in environmental conservation;
(xiii) Including adaptation and mitigation program in all development projects in order to address adverse impacts of climate change;
(xiv) Ensure sustainable utilization of ecosystem goods and services;

(xv) Implementation of 3R principle in utilization of resources;
(xvi) Strengthening institutional and legal capacity of institution (Government, local, private and technical) relevant to the enforcing and implementation of rules and regulation relating to environment policy and environment conservation;
(xvii) Ensuring considerations of climate change and challenges of calamities in all kinds of infrastructure projects;
(xviii) Reducing of all SLCP (Short-Lived climate pollutants) which are harmful to health and environment;
(xix) Taking development programs considering sustainable production and consumption as integral part of environmental conservation to meet the need of present and future generation;
(xx) Allocating necessary funds to all areas of environmental conservation, preservation and control;
(xxi) Taking up programs in favor of flourishing environment friendly economy; and
(xxii) Including environmental and ecological conservation particularly to introduce the environment and ecological concept in the environmental academic curriculum and textbooks of schools and colleges.

28. During environmental categorization and environmental impact assessment process in this project, provisions of NEP 2018 have been considered, especially the clauses mentioned in para. 27.

b. National Environmental Management Action Plan (NEMAP), 1995

29. The NEMAP built on the NEP to address specific issues and management requirements during the period 1995-2005 and remains a backbone of efforts to articulate national sustainability strategies. The plan includes a framework within which the recommendations of a National Conservation Strategy (NCS) are to be implemented. The NEMAP was developed with the following objectives:

(i) Identify key environmental issues affecting Bangladesh;
(ii) Identify actions to halt or reduce the rate of environmental degradation;
(iii) Improve management of the natural environment;
(iv) Conserve and protect habitats and biodiversity;
(v) Promote sustainable development; and
(vi) Improve the quality of life.

30. To this end, the NEMAP grouped all the relevant necessary actions under four heads: institutional, sectoral, location-specific and long-term issues. The institutional aspects reflect the need for inter-sectoral cooperation to tackle environmental problems requiring new institutional mechanisms at national and local levels. The sectoral aspects reflect the way the ministries and agencies are organized and make it easier to identify the agency to carry out the recommended actions. The location-specific aspect focuses on particularly acute environmental problems at local levels. And the long-term issues include environmental degradation trends that threaten to emerge as serious threats to the country's environmental quality and well-being if not proactively addressed.

c. Other Environment-Related Plan and Policies

31. In addition to the central environmental policy instruments, a number of other national policy efforts have significant environmental content. Prominent policy documents include the following National Plans, Policies Guidelines that confirm, compliment and support the National Environmental Policy:

(i) National Bio-safety Strategy & Action Plan 1995
(ii) National Biodiversity Strategy & Action Plan of Bangladesh 2016-2021
(iii) A Roadmap for Clean Fuels and Vehicles in Bangladesh, 2011
(iv) National Action Programme on Desertification, Land Degradation and Drought (DLDD) 2016-2024
(v) Ecologically Critical Area Management Rules, 2016.
(vi) Medical Waste (Management and Processing) Rules, 2008
(vii) Hazardous Waste and Ship Breaking Waste Management Rules, 2011
(viii) Bangladesh Biosafety Rules, 2012
(ix) Bangladesh Biological Diversity Act 2017
(x) Natural Water Reservoir Conservation Act, 2000
(xi) National Forestry Policy 2016
(xii) National Conservation Strategy 1998 and Draft Update 2013
(xiii) National 3R (Reduce, Reuse & Recycle) Strategy 2010
(xiv) Bangladesh Climate Change Strategy & Action Plan (BCCSAP) 2009
(xv) Bangladesh Delta Plan 2100
(xvi) National Disaster Management Plan 2010.
(xvii) Nationally Determined Contributions (NDCs)
(xviii) Five Year Plan
(xix) Sustainable Development Goals (SDGs)
(xx) National Adaptation Program (NAP) 2022
(xxi) Other Sectoral Policies/Strategies like Industry, Agriculture, Energy, Water, Health, etc.
(xxii) National Bio-safety Framework and Guidelines
(xxiii) Guidelines on Environmental Management, Waste Treatment and Workers' Occupational Health and Safety for Ship Breaking Yard in Bangladesh
(xxiv) Establishing National Landuse and Land Degradation Profile 2018 (proposed)
(xxv) EIA Guidelines for Industry 2021
(xxvi) Bangladesh Fire Prevention and Extinction Act, 2003
(xxvii) Fire Prevention and Extinction Rules, 2014
(xxviii) National Plan for Disaster Management, 2021-2025
(xxix) National Industrial Policy, 2022
(xxx) Hazardous Waste (E-Waste) Management Rules 2021
(xxxi) Balumohal and Soil Management Act 2010

32. During environmental assessment of this project, Ecologically Critical Area Management Rules, 2016; Natural Water Reservoir Conservation Act, 2000; Bangladesh Climate Change Strategy & Action Plan (BCCSAP) 2009; Bangladesh Delta Plan 2100; National Disaster Management Plan 2010; Nationally Determined Contributions (NDCs); Five Year Plan; Sustainable Development Goals (SDGs) and National Adaptation Program (NAP) 2022 have been considered.

2. Legislations

a. Bangladesh Environment Conservation Act (BECA), 1995 (as amended in 2000, 2002 & 2010)

33. The Bangladesh Environmental Conservation Act (BECA), 1995 is the main legislation for conservation of the environment, improvement of environmental standards, and control and mitigation of environmental pollution. The enabling powers of the BECA are wide ranging. Wide-ranging powers (Section 4) are given to the Director General (DG) to take various actions or measures to enforce the BECA (Table). The Environment Conservation Act authorizes the DOE to undertake any activity to conserve and enhance the quality of the environment and to control, prevent and mitigate pollution. The DOE is designated as the regulatory body and enforcement agency for all environment-related activities. The Act enables the following critical components of DOE's remit:

(i) declaration of Ecologically Critical Areas;
(ii) administration of the procedure for obtaining Environmental Clearance Certificates for new industrial projects;
(iii) regulation with respect to vehicles emitting smoke harmful to the environment;
(iv) environmental regulations for development activities;
(v) standards for quality of air, water, noise, and soils (including riverbed materials) for different areas and for different purposes;
(vi) acceptable limits for discharging and emitting waste; and
(vii) formulation of environmental guidelines to control and mitigate environmental pollution, conservation, and improvement of the environment.

34. Provision of BECA 1995 has been describes in Table II-1.Amendments to the ECA in 2000, 2002 and 2010 added significant substantive and procedural scope, defining the following new areas of authority:

(i) ascertaining responsibility for compensation in cases of damage to ecosystems;
(ii) increased provision of preventive measures, including fines and imprisonment, and the authority to take cognizance of offences;
(iii) restrictions on polluting automobiles;
(iv) restrictions on the production and sale of environmentally harmful items like polythene bags;
(v) obtaining assistance from law enforcement agencies for environmental actions;
(vi) definition and enforcement of punitive measures;
(vii) authority to try environmental cases;
(viii) prohibition on hill cutting except where established to be in the national interest;
(ix) authority to regulate management of hazardous waste produced by ship breaking yards;
(x) prohibition of filling or alteration of waterways except when judged to be in the national interest; and

(xi) additional powers to compel compliance with emissions standards.

Table II-1 Provisions of the BECA, 1995

Section	Provision Under Section
Section 4	Powers of the DG to enforce various provisions of the Act including setting rules and regulations for environmental conservation and protection.
Section 4A	Powers given to the DG to seek the assistance of other enforcement authority (or authorities) in its enforcement. Done indirectly by way of disconnecting power, gas, or water supply to the user.
Section 7	Allows the DG to seek compensation in cases of damage to the ecosystem or injury to person(s), whether directly or indirectly caused by a person or persons. He may also require that corrective or remedial action be taken to mitigate or ameliorate the situation.
Section 8	Allows any person affected or likely to be affected as a result of pollution or degradation of the environment to apply to the DG for remedy of the damage or apprehended damage.
Section 9	DG can require the person responsible and the person in charge of the place of occurrence of an accidental pollution take measures to control or mitigate the environmental pollution.
Section 12	Requires that an Environmental Clearance Certificate be obtained before an industrial unit or project can be established or undertaken.
Section 13	Formulate and publish environmental guidelines relating to the control and mitigation of environmental pollution, conservation and improvement of the environment.
Section 14	Allows appeal against grievances to the Appellate Authority. [Note: The Appellate Authority was constituted by MoEFCC by a notification dated 03/11/1997.
Section 15	Allows the imposition of penalties for various offences.
Section 20	Power to make rules for various purposes including the setting of EIA procedures.

Source: Compiled by TA consultant

35. Section 12, requiring an Environmental Clearance Certificate, is effectively enforced by The Environmental Conservation Rules, 2023, which is made pursuant to the powers provided under Section 20 of the BECA.

b. Environmental Conservation Rules, 2023

36. The Ministry of Environment, Forest and Climate Change of Bangladesh enacted the Environmental Conservation Rules (ECR) 2023 to implement the Environmental Conservation Act 1995. The rules have been effective from March 5, 2023, by repealing the Environmental Conservation Rules 1997. ECR 2023 is the most important set of regulations giving procedural substance and tools of enforcement to the aims articulated in the BECA 1995 and its amendments. The Rules specify the categorization of projects or industrial establishments by judging the severity of the project's (or industry's) impact on environment and human health.

37. ECR 2023 replaces all the old schedules stipulated in ECR 1997 and replaces the old four environmental categories i.e., 'green', 'orange A', 'orange B' and 'red' by new four categories i.e., 'green', 'yellow', 'orange' and 'red'. The new ECR also shades more lights on the determinants of environmental categorization of projects or industrial establishments, sets guideline for environmental impact assessment process and report preparation along with the qualification of environmental consultants and subject matter experts responsible for preparing environmental impact assessment reports. There are 14 schedules in the ECR 2023 which are described in Table II-2. The most highlighted changes in the ECR 2023 from 1997 edition is the inclusion of stakeholder engagement in the EIA process, adoption of impact of human health, setting qualification of environmental consultants for EIA study, setting standards for wastewater quality, inclusion of a comprehensive indicative list of categorized project/industries according to its impact on environment and human health, guidelines for location setting of a project or industry, guideline for ToR preparation for EIA study, indicative buffer distance between project/industry

and sensitive area, indicative EIA reporting guideline and guidelines for inclusion of environmental consultants within EIA study team.

Table II-2 Environmental standards specified in the Environment Conservation Rules 2023

ECR Schedule	Standard name
Schedule 1	Indicative list of projects/industrial establishment under four categories of environmental impacts
Schedule 2	Standards for water quality a. ground water, coastal waters, b. drinking water
Schedule 3	Standards for wastewater
Schedule 4	Standards for industrial wastewater
Schedule 5	Standards for category based industrial wastewater
Schedule 6	Fees for application for location clearance or environmental clearance certificates
Schedule 7	Fees for location clearance or environmental clearance certificates and renewal
Schedule 8	Fees for information collection/sample analysis from Department of Environment (DoE)
Schedule 9	Guideline for location setting of industrial establishments
Schedule 10	Guideline for ToR preparation for environmental impact assessment
Schedule 11	Guideline for environmental impact assessment report preparation
Schedule 12	Guideline for establishment and operation of industrial effluent treatment
Schedule 13	Guideline for inclusion of environmental consultants or subject matter specialists
Schedule 14	Determinants environmental categorization of industries

c. The Environment Court Act 2010

38. The Environment Court Act 2010 was passed with a view to ensuring the expedited disposal of environmental cases. The Act, consisting of 24 sections, amends and consolidates the existing law in establishing courts and related matters to expedite the trial of environmental crimes. It establishes administrative and legal proceedings of the above-mentioned Environment Court, as well requirements to be met by said court, which may direct the investigating officer or person for further investigation into a criminal case related to a case pending against him and may determine the deadline for reporting the report. The court may impose any power environment passed by this Act or the Environment Law. A lawyer appointed by the Director General shall conduct all the cases related to the trial in the Environment Court and the prosecuted lawyer shall be deemed to be a special public prosecutor in the case of a special public prosecutor and civil nature case, in case of prosecution: Provided that empowered by the Inspector or the Director General Any officer to assist the lawyer in managing the case. Subject to the provisions of this Act, in relation to the trial and settlement of compensation cases, the provisions of the Code of Civil Procedure shall apply, and, in that case, the Court of the Environment shall be deemed to be a civil court and enforce all the powers of the Civil Court in the trial of any compensation suit under this Act.

d. Air Pollution (Control) Rules 2022

39. Aiming to protect environmental health, the government has published a new rule based on section 20 of The Bangladesh Environment Conservation Act, 1995. The main objectives of this rule are to prevent, control, and reduce air pollution. The government will appoint a director general who will be responsible for managing and maintaining the environmental issue. The Rule specified several types of pollution such as pollution caused by factories, vehicles, construction, garbage, etc. According to the new rule, there will be a committee that will impose damages and punishment for such pollution. As stated by the rule, the government will give rewards to those who will protest against pollution and do not cause any type of pollution.

e. Noise Pollution (control) Rules, 2006

40. This rule has been promulgated under the provision of clause 20 of BECA, 1995. The rules provide for standard limits of noise level of vehicles and designated areas. According to the Rules, motor honking within a 100-meter radius of a hospital, school and office is prohibited. The rules also do not allow use of brick crushers and cement mixers within 500-meter radius of a residential area. Besides, prior permission is mandatory for using loudspeakers or megaphones. The rules stipulate safety and precautionary measures in workplaces, designated authorities for allowing noise generating appliances.

f. Solid Waste Management Rules 2021

41. The Solid Waste Management Regulations 2021 were published in Bangladesh on December 23, 2021, under the Bangladesh Environmental Protection Act, 1995. The Regulations define the responsibilities of businesses involved in solid waste management and impose collection, recycling, and disposal obligations according to Extended Producer Responsibility (EPR) on manufacturers of non-biodegradable products such as glass, plastic, and bottles. The Regulations also include provisions for the treatment of solid waste such as composting and energy recovery.

g. Environmentally Critical Areas Management Rules, 2016

42. Under the Ecologically Critical Area Rule 2016, a National Committee is to be formed which will consider the prevailing naturalness and biodiversity status of the threatened area and identify causes of deterioration and potential threat. It shall recommend to the government about alternative livelihood for the dependent population of the ECAs. This committee is also directed to supervise or provide guidance and directives to the nationally executed government development projects.

h. Other environment related rules and legislations

43. In addition to the ECA and ECR, numerous laws and supporting rules have been passed and developed to regulate the use of natural resources and protect the natural environment from deleterious activity. A summary of environment-related laws and rules, any of which may be relevant or applicable to proposed infrastructure development, is provided in Table II-3. Depending on the nature of project activities and infrastructure, No Objection Certificates (NOCs) may need to be obtained from the agencies overseeing environment-related laws and regulations as part of the environmental clearance process directed by DOE, to ensure compliance with all relevant national laws.

Table II-3 Summary of Environmental Legislations Applicable to the Proposed Project (resources protection)

No.	Environmental Legislation / Act	Objective	Relevance to the Project	Responsible Institution
1	National Forestry Policy (2016) Draft	The National Forestry Policy (NFP) provides the framework for the protection of the remaining forests in the country and the restoration of about 20% of the country's land under the afforestation programs.	Protected areas within the forest cannot be encroached by any project construction activities. No felling, cutting within protected or reserved forest is permitted. **Not**	Department of Forests

No.	Environmental Legislation / Act	Objective	Relevance to the Project	Responsible Institution
		The priority protection areas are the habitats which encompass representative flora and fauna in the core area of national parks, wildlife sanctuaries and game reserves. Multiple-use of forest, water and fish of the Sundarbans through sustained management will be ensured, keeping the bio-environment of the area intact.	**triggered by the project as the project area is outside designated forest areas declared by GoB**	
2	The Forest Act (1927) and Forest (Amendment) Act (2000)	An act to control trespassing, illegal resource extraction and provide a framework for the forestry revenue collection system. To accommodate social forestry, the act was amended in 2000.	Requires clearances for any project within forest areas and clearances for any felling, extraction, and transport of forest produce. **Not triggered by the project as the project area is outside designated forest areas declared by GoB**	Department of Forests
3	The Bangladesh Wildlife (Conservation & Security) Act, 2012	To conserve and protect wildlife in Bangladesh including designation of protected areas. Protection of wildlife is provided with lists of species with four schedules: first, second, third and fourth schedule. The fourth schedule species have the highest level of protection.	Consultation and necessary permits required if the project would pass through the wildlife sanctuaries and other protected areas. **Not triggered by this project. No wildlife or endangered species were found within the project boundaries.**	Forest Department
4	Bangladesh Protected Area Management Rules 2017	The rules portray the engagement process of the government authorities and local communities on how to be engaged in protected area management declared by the government. The rules cover protective activities such as regular inspections, security maintenance, annual planning of protection, actions against illegal activities, declaration of special reservation area etc.	No activity inside a declared PA is prohibited. **Not triggered by the project. The project boundaries selected are outside the designated PAs, national parks and Sanctuaries.**	Department of Forests
5	National Safe Drinking Water Supply and Sanitation Policy of 1998	Ensures access to safe water and sanitation services at an affordable cost	Pourashavas and water sanitation authorities will take actions to prevent wastage of water. They will take necessary steps to increase public awareness to prevent misuse of water. Pourashavas shall be responsible for solid waste collection, disposal and their management. **Triggered by the project. The EMP section will layout the plan for supplying safe drinking water for the construction workers and communities.**	Ministry of Local Government, Rural Development, and Cooperatives
6	National Water Act 2013 Bangladesh Water Rules 2018	Ensures Bangladesh water sources are free from any type of pollution. Pollution from water in urban outfalls and reservoirs, e.g., lakes,	Secure clearance certificate on water resource development subprojects. T**riggered by**	Ministry of Water Resources

No.	Environmental Legislation / Act	Objective	Relevance to the Project	Responsible Institution
		canals, ponds and ditches may result in amenity losses, fisheries depletion, health problems and fish and aquatic species contamination.	**the project. The water extraction for construction purposes and operation of the building will be sustainable and clearance will be taken from Dhaka City Corporation (North).**	
7	Wetland Protection Act 2000	Advocates protection against degradation and resuscitation of natural waterbodies such as lakes, ponds, beels[11], khals, tanks, etc. affected by man-made interventions or other causes. Prevents the filling of publicly owned water bodies and depressions in urban areas for preservation of the natural aquifers and environment. Prevents unplanned construction on riverbanks and indiscriminate clearance of vegetation on newly accreted land.	In case of diversion of water from any lake, a detailed assessment needs to be done. **Not triggered. No wetlands are nearby, as per project prerequisite. The prosed site is within the college boundary.**	Ministry of Water Resources
8	The Pourashava Act 2009 / Ordinance issued for the amendment of local government (municipality) ordinance, 2009 and 2010; The Pourashava Ordinance, 1977; Municipal Administration Ordinance, 1960	Provides guidance for subproject integrated community and workers health and hygiene at the construction and operation and maintenance stages of the project	Coordinate with pourashava committees on disaster management measures, water and sanitation and waste management. **Triggered. During building design, construction and operation the acts were considered and applied.**	Local Authorities
9	Bangladesh Climate Change Strategy and Action Plan of 2009	Enhances the capacity of government ministries, civil society and private sector to meet the challenges of climate change	Integrate adaptation measures for buildings in consideration of extreme climatic events. **Triggered. The BCCSAP 2009 has been considered in building design and also in the entire project consideration.**	Ministry of Environment, Forests and Climate Change
10	Building Construction (Amendment) Act and Building Construction Rules, Bangladesh National Building Code	Regulates technical details of building construction and to maintain standards of building construction	Follow specifications to ensure structural integrity of buildings. **Triggered. BNBC has been considered during building design.**	Ministry of Housing and Public Works
11	Electricity Act 2018	Requires compensation for any damage, detriment or inconvenience caused by the project; Requires precautionary measures in laying down electricity	**Triggered. The following are ensured:** Secure permission to supply energy and lay	Ministry of Power, Energy and Mineral Resources

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

No.	Environmental Legislation / Act	Objective	Relevance to the Project	Responsible Institution
		supply lines near or where any metallic substance or line crosses to avoid electrocution; directs in powerline laying construction related activities to avoid public nuisance.	down or place electricity supply lines for the conveyance and transmission of electricity from respective authorities prior to any works. Give full compensation for any damage, detriment or inconvenience caused by him or by anyone employed by him/her. Take precautions in laying down electricity supply lines near or where any metallic substance or line crosses in order to avoid electrocution.	
12	The National Energy Policy (1996 and Updated 2004)	Ensures environmentally sound sustainable energy development programs causing minimum damage to the environment, to encourage public and private sector participation in the development and management of the energy sector and to bring the entire country under electrification.	Public and private sector participation in the development and management of energy subprojects. Provides guidelines for renewable energy subprojects. **Triggered. Renewable energy provisions are considered in the building design process.**	Ministry of Power, Energy and Mineral Resources
13	Standing Order on Disaster, 1999 (Updated 2010)	Enhances capacity at all tiers of government administrative and social structures for coping with and recovering from disasters	**Triggered. All building structures and labs are designed to cope with local disasters accordingly.**	Ministry of Disaster Management and Relief
14	National Disaster Management Act of 2012	Establishes a framework for managing disasters in a comprehensive way.	Setting-up emergency response procedures. **Triggered. The project structure is to follow the setup of the Act.**	Ministry of Disaster and Relief
15	East Bengal Protection and Conservation of Fish Act 1950 (1982)	Protection and conservation of fishes in inland water bodies of Bangladesh	No wetland or canal should be encroached or obstructed due to construction and operation of the projects. **Not triggered. No fishpond or fisheries entities are nearby. Criteria selection for project are ensured of that.**	Department of Fisheries
16	Public Procurement Rule (2008)	Applies to the procurement of goods, works or services by any government, semi-government or any statutory body established under any law; includes measures regarding the safety, security and protection of the environment in construction works; requires Contractors to take all reasonable steps to safeguard the health and safety of all workers on site, protect	**Triggered.** The PPR (2008) will be followed during procurement process of the subprojects	Ministry of Public Works

No.	Environmental Legislation / Act	Objective	Relevance to the Project	Responsible Institution
		the environment on and off the site, and avoid damage or nuisance to persons or to property of the public or others		
17	Bangladesh Fire Prevention and Extinction Act, 2003 Fire Prevention and Extinction Rules, 2014	The Bangladesh Fire Prevention and Extinction Act, 2003 (Act No. 7 of 2003) and Rules 2014 are crucial legislation aimed at safeguarding lives, property, and valuable assets from fire hazards. The key considerations are: (i) fundamental requirements for fire safety. It covers aspects such as fire prevention, preparedness, and response; (ii) emphasizes the need for fire protection measures in buildings, public spaces, and other areas susceptible to fire incidents; (iii) adherence to safety protocols, regular inspections, and maintenance of fire extinguishers, alarms, and other firefighting tools	**Triggered.** During construction and operation, fire safety protocols that stipulated in the Act 2003 and Ruled 2014 will be followed.	Department of Fire Service and civil Defense
18	National Plan for Disaster Management, 2021-2025	The National Plan for Disaster Management (NPDM) 2021-2025 outlines the strategic vision and mission of the Government of Bangladesh in collaboration with the Ministry of Disaster Management and Relief (MoDMR). This comprehensive plan aims to build a resilient nation by addressing the challenges posed by natural and man-made disasters. The plan emphasizes on: (i) Investments for building resilience against chronic disasters; (ii) Social protection; (iii) Resilient post-disaster response and recovery	**Triggered.** During construction and operation, the NPDM will be considered.	Ministry of Disaster Management and Relief (MoDMR)
19	Balumohal and Soil Management Act 2010	The Balumohal and Soil Management Act 2010 (Act No. 62 of 2010) deals with the provision of leasing Balumohal, extraction of sand and soil, soil management, and other related matters. This law specifies regulations regarding the leasing of Balumohal, exchange of money for sand or soil extraction, Balumohal management, and other relevant issues.	**Triggered.** During construction contractor will be carrying sand, silt from government approved balu mohal, as per the Act 2010	District Commissioner

i. Comparative Environmental Safeguard Compliance

Table II-4 Comparative Environmental Safeguard Compliance

Safeguard Area	GoB Requirement	ADB SPS Requirement	Compliance Status
Legal basis for assessment	Bangladesh Environment Conservation Act (BECA) 1995 (as amended); Environment Conservation Rules (ECR) 2023 require an Environmental Clearance	SPS 2009 requires environmental assessment proportional to project category, with EARF guiding site-specific IEE preparation for programs with multiple subprojects	Compliant — Site-specific IEE prepared for EDC-BUTEX consistent with the SICIP EARF and ECR 2023 requirements

Safeguard Area	GoB Requirement	ADB SPS Requirement	Compliance Status
	Certificate (ECC) under Section 12 of BECA prior to establishing any industrial unit or project		
Project categorization	ECR 2023 classifies projects into Green, Yellow, Orange, Red categories per Schedule 1; multi-storied buildings and diagnostic laboratories fall under the Orange category	SPS 2009 uses Category A, B, C, FI; Category B requires an IEE (not a full EIA)	Compliant — EDC-BUTEX confirmed as Orange under ECR 2023 and Category B under ADB SPS; pending final DoE confirmation upon IEE review
Environmental clearance	ECC must be obtained from DoE before construction, per BECA Section 12 and ECR 2023 procedures	ADB requires borrower to secure host-country environmental clearance as part of due diligence prior to loan effectiveness	Pending — IEE submitted for DoE review; ECC issuance to be confirmed before construction start
Impact assessment scope	ECR 2023 Schedule 10 and 11 set ToR and EIA/IEE report preparation guidelines, including stakeholder engagement and human health impacts	SPS 2009 requires identification and assessment of impacts, examination of alternatives, and preparation of EMP with mitigation measures	Compliant — IEE addresses baseline environment, impact assessment (pre-construction, construction, operation phases), and EMP with mitigation and monitoring measures
Waste management (general)	National 3R Strategy 2010; Hazardous Waste and Ship Breaking Waste Management Rules 2011; Hazardous Waste and E-Waste Management Rules 2021	SPS 2009 requires waste management plans embedded in EMP, covering solid, hazardous, and effluent waste streams	Partially compliant — Solid and laboratory waste management plans identified in EMP; ADB review comment requests fuller description of laboratory waste streams, treatment facility, and dedicated impact subsection in Project Description and Potential Impacts chapters
Laboratory/hazardous waste	Medical Waste Management and Processing Rules 2008 provide partial analogy; no dedicated national rule specific to academic/textile laboratory waste	SPS 2009 requires assessment of occupational and community health risks from hazardous materials handling	Gap identified — ADB comment flags absence of a clear description of anticipated laboratory activities, waste streams, and treatment/disposal arrangements; revision in progress to add this content
Occupational health and safety	Bangladesh Labour Act (enforced via MoLE, Department of Factory and Establishment Inspection); Fire Prevention and Extinction Act 2003 and Rules 2014	SPS 2009 requires OHS Plan including PPE, training, and emergency response procedures	Compliant — OHS Plan (including COVID-19 measures per ADB/GoB guidance) embedded in CEMP; laboratory-specific Emergency Response Plan and training requirements specified
Water quality	ECR 2023 Schedule 2–5 set standards for groundwater, drinking water, wastewater, and industrial effluent	SPS 2009 requires pollution prevention consistent with World Bank/IFC EHS Guidelines where national standards are less stringent	Compliant — Surface water and drinking water quality monitoring specified quarterly/annually against ECR 2023 standards; laboratory effluent discharge monitoring to be added per ADB comment

Safeguard Area	GoB Requirement	ADB SPS Requirement	Compliance Status
Air quality	Air Pollution Control Rules 2022 set ambient air quality standards (PM2.5, PM10, SO2, CO, NO2)	SPS 2009 requires air quality monitoring where construction/operation may generate emissions	Compliant — Quarterly ambient air quality monitoring specified during construction and operation phases
Climate change mitigation/adaptation	Bangladesh Climate Change Strategy and Action Plan (BCCSAP) 2009; NDCs; National Adaptation Program (NAP) 2022; Bangladesh Delta Plan 2100	SPS 2009 requires climate risk screening and integration of adaptation measures into design	Compliant — GHG-limiting design features and flood-level siting of critical components (including laboratory) integrated into detailed design per Climate Risk Assessment findings
Public disclosure and consultation	ECR 2023 introduces mandatory stakeholder engagement in the EIA process	SPS 2009 requires timely disclosure of relevant information in accessible language/format and meaningful consultation	Compliant — Stakeholder workshops and consultations documented for traffic, induced development, and cumulative impact topics
Grievance redress mechanism	Environment Court Act 2010 provides formal judicial recourse for environmental grievances	SPS 2009 requires a project-level Grievance Redress Mechanism (GRM), separate from national judicial process	Compliant — Central GRM and Workers GRM established and publicized prior to construction start
Monitoring and reporting	DoE requires quarterly environmental monitoring reports during construction and operation	SPS 2009 requires semi-annual monitoring reports to ADB during construction, and periodic reporting during operation	Compliant — Reporting matrix specifies Contractor/EHSO monthly reports, SOU quarterly reports to DoE, and semi-annual reports to ADB
Institutional capacity	BECA/ECR designate DoE as lead regulator; no explicit GoB requirement for project-level EHS units	SPS 2009 requires borrower to maintain adequate institutional capacity for EMP implementation, including operation-phase oversight	Gap identified — IEE notes neither SDCMU nor BUTEX currently has a functioning permanent EHS unit; capacity-building program recommended prior to end of construction

j. Other environment related rules and legislations

44. During construction, the subproject will conform to the occupational and health related rules as outlined in the Table II-4 below.

Table II-5 Occupational and health safety related rules in Bangladesh

Title of Laws and Rules	Descriptions
Social Security under the Act, 1923 and an amendment in 1980	According to the Act social impact assessment includes the processes of analyzing, monitoring and managing the intended and unintended social consequences, both positive and negative of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions.
Bangladesh Labour (Amendment) Law, 2018	Compliance to the provisions on employment standards, occupational safety and health, welfare and social protection, labor relations and social dialogue, and enforcement Prohibition of employment of children and adolescent
Labour Rules 2015	The Labor Rules give substantial practical heft to the Labor Act, specifying standards for workplace dimensions and features, responsibilities of employers and facility owners, limits on working hours, special rules for young workers, and many other workplace safety and worker protection matters. The Rules provide the basis for inspections of construction

Title of Laws and Rules	Descriptions
	sites and industrial facilities by the Department of Inspection for Factories and Establishments (DIFE) under Ministry of Labour and Employment (MoLE).
The Employer's Liability Act, 1938	The Act declares that the doctrine of common employment and of assumed risk shall not be raised as a defense in suits for damages in respect of employment injuries. Under the Maternity Benefit Act, 1939, the Maternity Benefit Act, 1950, the Mines Maternity Benefit Act, 1941, and finally the rules framed thereunder, female employees are entitled to various benefits for maternity, but in practice they enjoy leave of 6 weeks before and 6 weeks after delivery.
Public Health (Emergency Provisions) Ordinance, 1994	The ordinance calls for special provisions with regard to public health. Whereas an emergency has arisen, it is necessary to make special provision for preventing the spread of human disease, safeguarding public health and providing them adequate medical service and other services essential to the health of respective community and workers in particular during the construction related work.
The Employees State Insurance Act, 1948	It has to be noted that health, injury and sickness benefit should be paid to people, particularly respective workers at workplace under the Act.
Bangladesh Factory Act, 1979	The Act 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.
Water Supply and Sewerage Authority Act, 1996	The Act specify WASA's responsibility to develop and manage water supply and sewerage systems for the public health and environmental conservation.

D. International commitments

45. Bangladesh has signed many international treaties, conventions and protocols that pertain to environmental conservation, pollution control, and working conditions, and these need to be considered alongside national laws and regulations in the context of infrastructure planning. A list of the most relevant international treaties and conventions to which Bangladesh is a party is presented in Table II-5.

Table II-6 Treaties and conventions joined by Bangladesh and applicable to this project

Treaty or Convention	Brief description
International Plant Protection Convention (Rome, 1951) & Plant Protection Agreement for SE Asia and Pacific (1999 Revision)	Aims to ensure that construction work and construction materials do not introduce plant pests
Conservation of Wetlands of International Importance specially as waterfowl Habitat ("Ramsar Convention": Iran, 1971)	Conservation and proper use of wetlands and their resources; protection of significant wetlands and prevention of draining or filling during construction
Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris, 1972)	Prevention of damage or destruction of culturally and/or historically significant sites, monuments, etc.
CITES Convention (Convention on International Trade in Endangered Species)	Aims to ensure that international trade in specimens of wild animals and plants does not threaten their survival
Occupational hazards due to air pollution, noise & vibration (Geneva)	Aims to protect workers against occupational hazards in the working environment
Occupational safety and health in working environment (Geneva)	Prevent accidents and injury to health by minimizing hazards in the working environment
Occupational health services (Geneva)	To promote a safe and healthy working environment
Convention on Biological Diversity, (Rio de Janeiro, 1992)	Protection of biodiversity during construction and operation; underpins the value of natural resources that provide food and livelihoods throughout the world
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1992)	Aims to protect human health and the environment against the adverse effects of hazardous wastes

Treaty or Convention	Brief description
International (United Nations Framework) Convention on Climate Change (Kyoto Protocol, 1997)	International treaty on climate change and emission of greenhouse gases, reduce greenhouse gas concentrations in the atmosphere to a level that would prevent dangerous anthropogenic interference with the climate system
Convention on Persistent Organic Pollutants, Stockholm, 2001	Restriction of use of pesticides and herbicides
Minamata Convention on Mercury, 2017	Global treaty to protect human health and the environment from the adverse effects of mercury, by addressing interim storage and disposal, sites contaminated by mercury, and mercury-related health issues

E. Environmental Assessment Process and Requirements

46. This project is subject to the environmental safeguards requirements of both the Government of Bangladesh and ADB. These requirements share some concepts and terminology and are non-contradictory. The two procedural frameworks for environmental impact assessment are described in turn below.

1. National Environmental Clearance Process

47. **Categorization schemes.** The Environment Conservation Rules 2023 stipulate a four-level color-coded typology of impact potential as the basis for determining the environmental clearance process for different types of proposed projects, and the extent of environmental assessment work that must be done in support of clearance applications submitted by proponents. The categorization framework is outlined in Table II-6.

Table II-7 Categorization scheme for determining environmental clearance requirements posed by DoE

Category	General Environmental Assessment Requirement
Green	No environmental assessment required to support application for environmental clearance
Yellow	No environmental assessment required, but detailed project information, including process flow diagrams and effluent treatment arrangement, must accompany application for environmental clearance
Orange	Initial Environmental Examination (IEE) required, and project can proceed to environmental clearance application once IEE is approved by DOE
Red	Brief IEE required to establish ToR for comprehensive Environmental Impact Assessment (EIA), and project can proceed to environmental clearance application after EIA and Environmental Management Plan (EMP) have been approved by DOE, often subject to conditions

48. The Environment Conservation Rules (Schedule I) provide indicative lists of types of projects, facilities and infrastructure that would normally fall into each of the four assessment categories. Although these lists are quite comprehensive, the listed types may in many cases not apply unambiguously to a given proposed infrastructure element or project activity. Further, the matters of scale and context, which determine so much of impact potential, are not strongly addressed by the indicative lists. Assigning an assessment category thus must be informed by

expert judgement, based on the initial specifications of the planned project infrastructure and activities, and basic details of the project environment. DoE has noticed this. Hence the ECR 2023 includes the process of engaging experts in the environmental impact assessment process. DoE reviews preliminary infrastructure plans for proposed infrastructure investments and decides regarding the categorization on a case-by-case basis.

49. **Environmental clearance process.** According to the ECR 2023, all projects/industries must apply for a Location Clearance certificate (LCC) prior to the application for Environmental Clearance certificate (ECC) (Figure II-1). The DoE is responsible for awarding both certificates. Regardless of the assessment category assigned, all applications for environmental clearance must be accompanied by a NOC obtained from local authorities (Union Parishad Chairman or Upazila Nirbahi Officer in rural polytechnic locations, and from several entities in urban locations such as Chattogram), and by an application fee. NOCs may also be required from key agencies (e.g., Water Resources Planning Organization, Forests Department, Ministry of Fisheries) if the proposed project has any potential relevance for the natural resources under their remit. The proponent is responsible for obtaining the NOCs and paying the application fee. The proponent is also responsible for renewing the clearance certificate, once obtained, on a yearly/2 yearly/5 yearly basis, paying a fee for each renewal. Fines are levied when the proponent allows the clearance certificate to lapse.

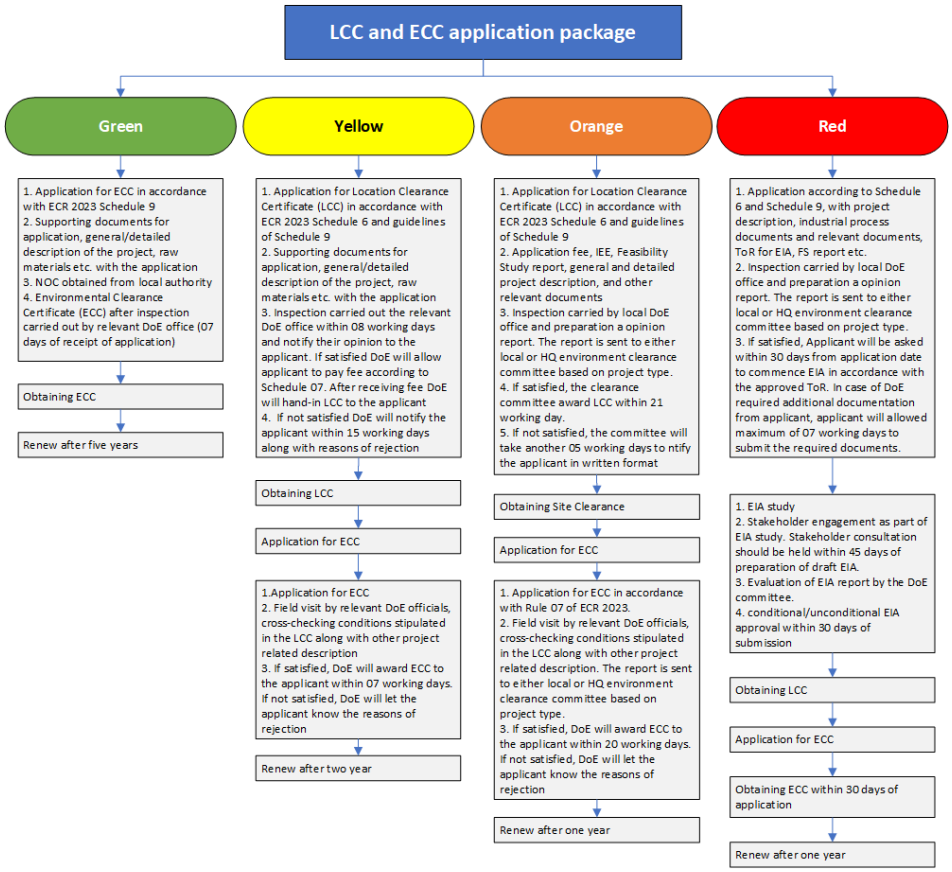


Figure II-1 Location Clearance Certificate (LCC) and Environmental Clearance certificate (ECC) application and awarding process from DoE

50. For investments that require an environmental assessment report (Orange and Red projects), DoE reviews and approves the report (either an IEE or more detailed EIA) before approving the clearance application. The approval may be subject to certain conditions, which the proponent is bound to meet to keep the clearance certificate current. Review time of clearance applications by DoE varies with project category. Environmental Review and clearance process of SICIP is shown below (Figure II-1).

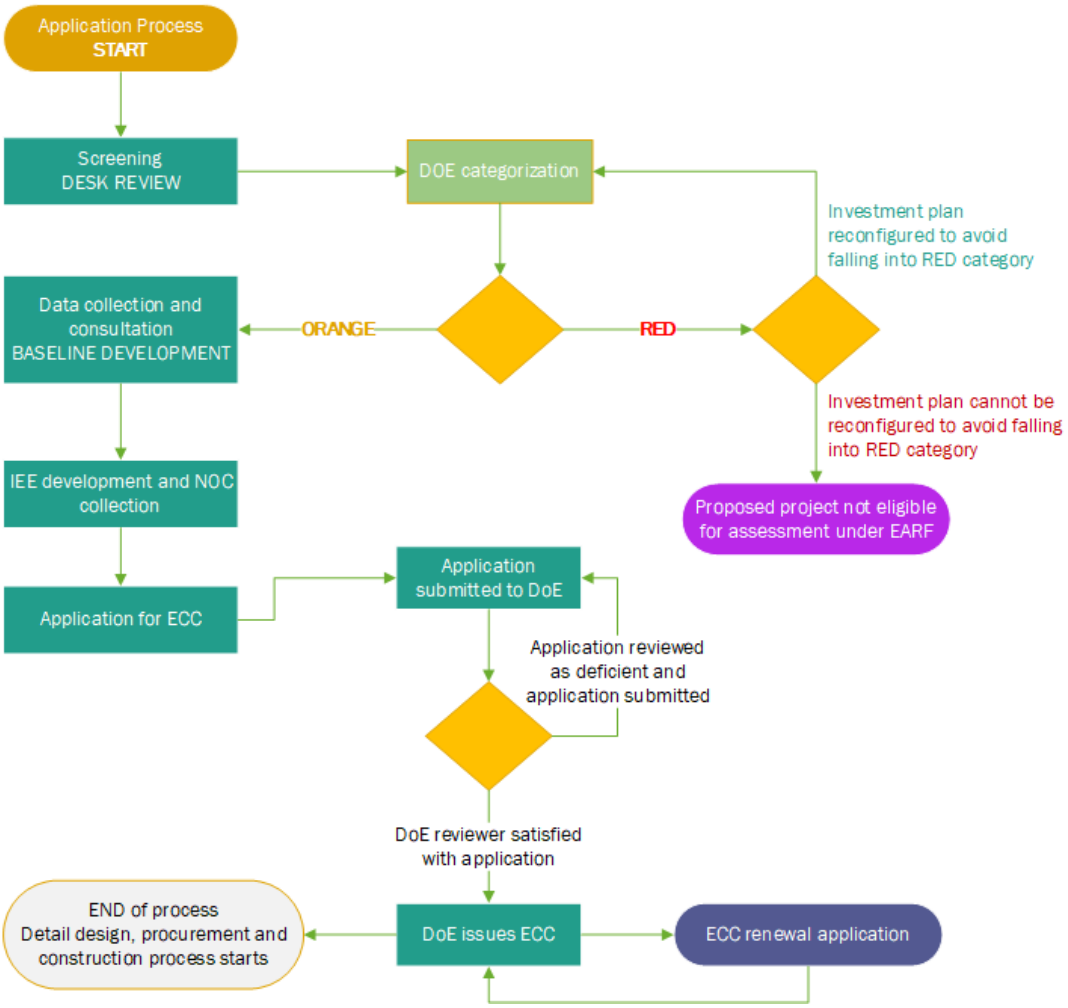


Figure II-2 Flowchart of national clearance process as applicable to SICIP

51. **Anticipated DoE assessment category.** The infrastructure development proposed for the EDC building within BUTEX campus under the project will appropriately be considered to fall into the 'Orange' assessment category. The investments do not include any components that would trigger assignment to the 'Red' category, but do encompass components (multi-storied buildings, diagnostic laboratory) included in the 'Orange' list in Schedule 1 of the Environment Conservation Rules 2023. This IEE report will be reviewed by DoE, and the anticipated categorization will be confirmed at that time.

Table II-8 Anticipated project category according to the ECR 2023

Project description	Similar category (as per ECR 2023)	Likely category	Comments
Construction, repair and retrofitting of academic and administrative multistorey buildings and labs	Item no. 25: Residential and commercial buildings (5000 – 20000 sqm built-up area)	Orange	Construction will take place within BUTEX campus

Source: Information taken from ECR 2023 and interpreted by the consultant

2. ADB Environmental Assessment Requirements

52. Safeguard requirements for all projects funded by the ADB are defined in the ADB Safeguard Policy Statement, 2009 (ADB SPS). This document establishes an environmental review process to ensure that projects undertaken as part of programs funded through ADB loans are environmentally sound, are designed to operate in compliance with applicable regulatory requirements, and are not likely to cause significant environmental, health, or safety hazards. The SPS is one of the key Bank Policies collected in the ADB Operations Manual. The policy promotes good practice as reflected in internationally recognized standards such as the World Bank Group's Environmental, Health and Safety Guidelines.

53. SPS 2009 provides a framework of expectations for environmental analysis, engagement with stakeholders and communities potentially affected by projects, reporting, and follow-up implementation. Key prescriptions include the following:

(i) At an early stage of project preparation, the borrower/client will identify potential direct, indirect, cumulative, and induced environmental impacts on and risks to physical, biological, socioeconomic, and cultural resources and determine their significance and scope, in consultation with stakeholders, including affected people and concerned NGOs. If potentially adverse environmental impacts and risks are identified, the borrower/client will undertake an environmental assessment as early as possible in the project cycle. For projects with potentially significant adverse impacts that are diverse, irreversible, or unprecedented, the borrower/client will examine alternatives to the project's location, design, technology, and components that would avoid, and, if avoidance is not possible, minimize adverse environmental impacts and risks.
(ii) The assessment process will be based on current information, including an accurate project description, and appropriate environmental and social baseline data;
(iii) Impacts and risks will be analyzed in the context of the project's area of influence.
(iv) Environmental impacts and risks will be analyzed for all relevant stages of the project cycle, including preconstruction, construction, operations, decommissioning, and post- closure activities such as rehabilitation or restoration.
(v) The assessment will identify potential trans-boundary effects as well as global impacts; and
(vi) Depending on the significance of project impacts and risks, the assessment may comprise a full-scale environmental impact assessment (EIA) for Category A projects, an initial environmental examination (IEE) or equivalent process for Category B projects, or a desk review.

54. Screening for potential social and environmental impacts is a critical early step in the preparation of a proposed ADB-funded project. Preliminary project conceptual designs and sites are evaluated using a standard checklist, and assigned to one of four categories, as follows:

(i) **Category A.** A proposed project is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An Environmental Impact Assessment is required.
(ii) **Category B.** A proposed project is classified as category B if its potential adverse environmental impacts are less adverse than those of category A projects. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. An Initial Environmental Examination is required.
(iii) **Category C.** A proposed project is classified as category C if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required, although environmental implications need to be reviewed.
(iv) **Category FI.** A proposed project is classified as category FI if it involves investment of ADB funds to or through a financial intermediary.

55. Based on initial screening of components proposed, the project was assigned to **Category B**, pending further study. Accordingly, IEEs were deemed the appropriate mode of assessment for subprojects, unless early analysis based on conceptual design specifications and field reconnaissance were to reveal potential for impacts that require study and mitigation planning of a scale and complexity better addressed through the more detailed and exhaustive EIA. IEEs and EIAs are similar in terms of procedural steps and the structure of reports, but an EIA typically requires (i) more detailed investigation of impact linkages; (ii) collection of more and higher quality baseline data regarding key impact areas; (iii) often a longer and multi-phased study period; and (iv) deeper engagement and consultation with potentially affected people.

56. Important tools and outputs specified by the SPS 2009 for IEEs and EIAs include the following:

(i) **Environmental Audit report on existing facilities:** When the project involves existing activities or facilities, relevant external experts will perform environmental audits to determine the existence of any areas where the project may cause or is causing environmental risks or impacts. Since the BUTEX building will use the existing campus facilities, as per ADB SPS 2009 an environmental audit report will be required.
(ii) **Environmental Management Plan.** The borrower/client will prepare an environmental management plan (EMP) that addresses the potential impacts and risks identified by the environmental assessment and prescribes appropriate mitigation measures to address them effectively.
(iii) **Consultation and Participation.** The borrower/client will carry out meaningful consultation with affected people and other concerned stakeholders, including civil society, and facilitate their informed participation.
(iv) **Information disclosure.** The borrower/client will submit to ADB the following documents for disclosure on ADB's website: (i) a draft full IEE (including the EMP); (ii) a new or updated IEE and corrective action plan prepared during project implementation, if any.

(v) **Grievance Redress Mechanism.** The borrower/client will establish a mechanism to receive and facilitate resolution of affected people's concerns, complaints, and grievances about the project's environmental performance.

(vi) **Monitoring reports.** Results from monitoring of the implementation of a project's EMP are reported semi-annually to the ADB, based on internal monitoring activity carried out more frequently (quarterly, monthly, weekly or daily) as appropriate to different project activities and impacts. Monitoring assesses compliance with the measures detailed in the EMP, as well as measurable effects of project activities on the environment.

(vii) **Unanticipated impact.** If unanticipated involuntary resettlement impacts are found during project implementation, the borrower/client will conduct a social impact assessment and update the resettlement plan or formulate a new resettlement plan covering all applicable requirements specified in this document.

(viii) **Occupational Health and Safety.** The borrower/client will provide workers with a safe and healthy working environment, taking into account risks inherent to the particular sector and specific classes of hazards in the borrower's/client's work areas, including physical, chemical, biological, and radiological hazards.

(ix) **Community Health and Safety.** The borrower/client will inform affected communities of significant potential hazards in a culturally appropriate manner. The borrower/client will be prepared to respond to accidental and emergency situations. This preparation will include response planning document(s) that addresses the training, resources, responsibilities, communications, procedures, and other aspects required to respond effectively to emergencies associated with project hazards.

(x) **Physical Cultural Resources.** The borrower/client is responsible for siting and designing the project to avoid significant damage to physical cultural resources.13 Such resources likely to be affected by the project will be identified, and qualified and experienced experts will assess the project's potential impacts on these resources using field-based surveys as an integral part of the environmental assessment process.

(xi) **Harmonizing with Other MFIs' Safeguard Policies.** Harmonizing ADB's safeguard policy principles and requirements with those of other MFIs is also required to enhance development impacts, reduce transaction costs, and encourage collaborative behavior. ADB believes that it should harmonize its safeguard policies with those of other MFIs, especially in relation to key policy principles, whereas procedures across MFIs need to cater to a variety of clients and situations.

(xii) **Bidding and contract documents.** To ensure that contractors appropriately implement the agreed measures, the borrower/client will include the safeguard requirements in bidding documents and civil works contracts. Where national safeguard policies and regulations differ from ADB's safeguard policy statement including Safeguard Requirements, ADB and the borrower/client will formulate and agree on specific measures to ensure that ADB's safeguard policy principles and requirements are fully complied with.

57. Each of the key elements listed above is addressed in this IEE report.

58. **Updated ADB categorization.** Based on the findings presented in this IEE, it is confirmed that some of the infrastructure components proposed for BUTEX additional building will have at least some negative impacts requiring mitigation, but also unlikely that any will generate

impacts of a scale, complexity or severity that would warrant detailed environmental research or development of highly novel mitigation strategies. Accordingly, the **Category B** classification, assigned to the project at the early concept stage based on ADB screening, is considered valid for this investment location. This could change if the design, scale, nature, or location of any proposed components undergoes significant modification before or after project approval.

III. PROJECT DESCRITPION

A. Project Location

59. The proposed additional academic and training facility for Bangladesh University of Textiles (BUTEX) the Executive Development Centre (EDC) (23° 45′ 36″ N, 90° 24′ 7″ E) will be constructed within the existing BUTEX campus located at 92 Shaheed Tajuddin Ahmed Avenue, Tejgaon Industrial Area, Dhaka-1208 (Figure III-1). The EDC is planned as a 12-storied facility (G+11) with one basement, designed as Building Type B1 (BNBC), with a total floor area of ~12,980 m² on a campus plot of ~2,050 m² (Figure III-2). The project footprint includes defined open/green areas and setbacks, and the site fronts an 18 m wide road on the south (front side), supporting construction access and future operational circulation.

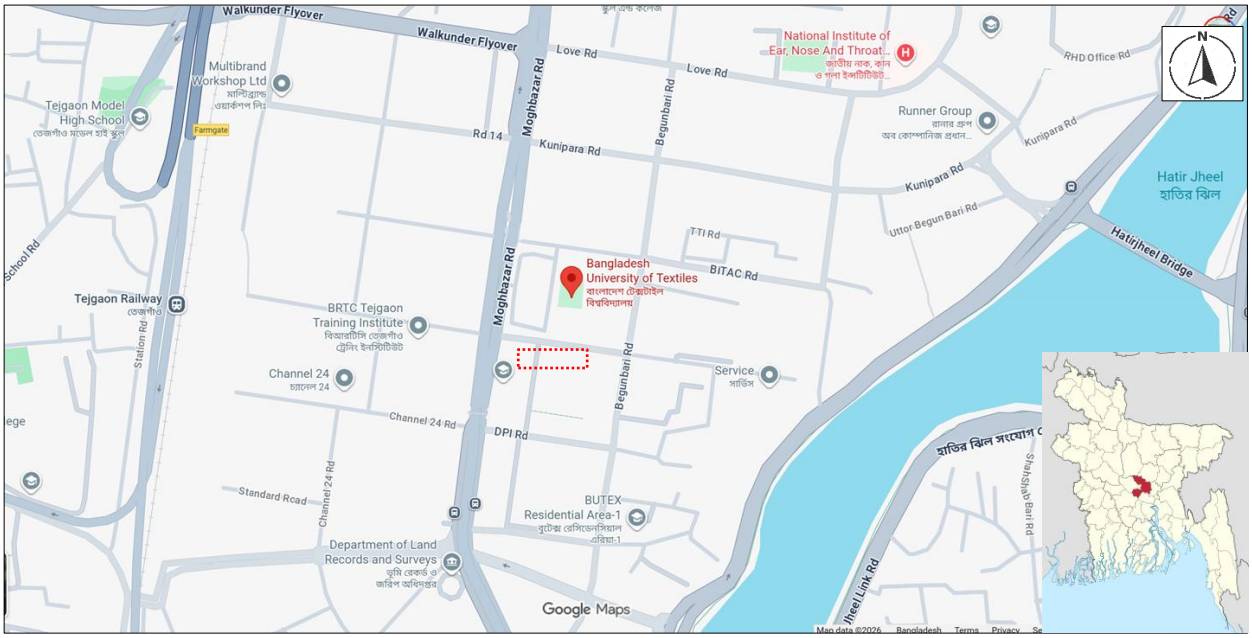


Figure III-1 Location map of the proposed infrastructure at BUTEX campus (red marker). Courtesy: Google maps

Image courtesy: Google maps. Prepared by: TA consultants.

60. The EDC building is conceived as a multi-functional academic, laboratory, and professional development facility, with key functions distributed across floors (Figure III-2). The basement level accommodates parking and essential engineering/mechanical/electrical (EME) spaces; the lower floors include entry/lobby and student-service functions; mid-level floors are primarily laboratory and classroom zones; and upper levels include office/exam spaces, a library, and a multipurpose hall, with roof provisions for solar/garden features. The design provides two staircases and four lifts and includes both basement and surface parking provisions aligned with the floor area and use intensity. This siting approach leverages existing institutional land and services, avoiding new land acquisition while concentrating development inside a controlled campus setting.

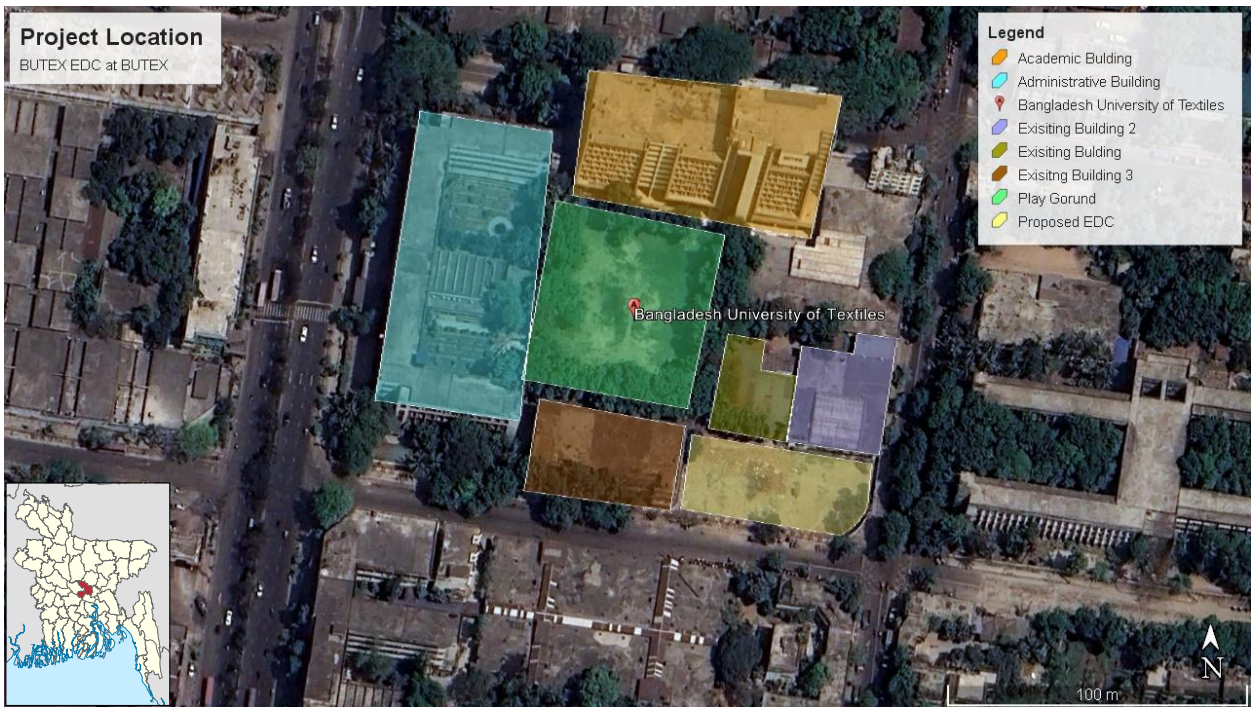


Figure III-2 Proposed location of the proposed EDC Building at BUTEX and its physical surroundings. Image courtesy: Google Earth

Image courtesy: Google earth. Prepared by: TA consultants.

61. BUTEX is situated in the Tejgaon Industrial Area of Dhaka, a highly urbanized and mixed institutional–industrial setting with strong city connectivity via Shaheed Tajuddin Ahmed Avenue and surrounding arterial roads (Figure III-1). The university has a long institutional history in textile education (originating as a weaving/textile institute and later upgraded to a full university under the Bangladesh Textile University Act, 2010, effective from 22 December 2010). From an environmental setting perspective, the broader Tejgaon–Moghbazar–Rampura zone is closely associated with the Hatirjheel–Begunbari lake/drainage system, which is an important urban drainage feature for Dhaka and is described in literature as extending across areas including Tejgaon. This context makes drainage management, construction traffic management, and nuisance control (dust/noise) especially relevant for the EDC subproject due to the dense surrounding land use and sensitive campus receptors (students, staff, visitors).

B. Existing Infrastructure

62. The proposed EDC site is located within the existing BUTEX campus and is part of the campus development area shown in the Part Master Plan. The master plan indicates that the EDC will be developed in an area presently occupied by low-rise campus structures and open campus space, and that one existing 1-story buildings are planned to be demolished to accommodate the new development and associated access/entry arrangements. The existing building has only one room, hence the demolition waste is expected to be negligible. The site is bounded by campus roads/footpath connections and is integrated with the wider campus circulation system (Figure III-3).

63. The BUTEX campus already functions as a developed institutional property with internal circulation and basic site services. For the EDC, the design establishes key site planning controls that will interface with existing campus infrastructure, including a southern frontage to an 18 m wide road (Front/South) and defined setbacks/separation distances (North 3.0 m; South 5.5 m; East 7.0 m; West 13.0 m) (Figure III-3).

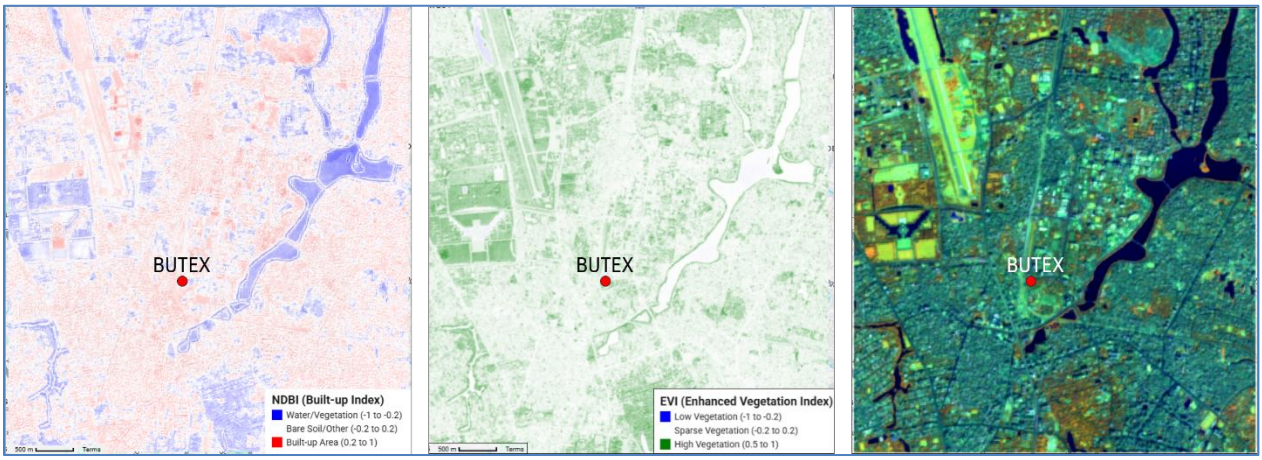


Figure III-3 Natural surroundings of the proposed construction site of EDC at BUTEX

Image courtesy: Google earth. Prepared by: TA consultants.

64. Drainage system is developed at the site which is functional (**Error! Reference source not found.**). The proposed structures can use this drainage system; no additional drainage system will be required. The drainage system is connected to the Municipal main drainage system.

Figure III-4 Drainage system is functioning within the BUTEX campus.

Source: TA consultant

C. Proposed Infrastructures

65. Overall building configuration and site parameters. The proposed facility is the Executive Development Centre (EDC) designed as a 12-storied building (G+11) with one basement, classified as Building Type B1 (BNBC). The architectural schedule notes: Land area ~2,050 m²; ground coverage ~1,015 m²; open space ~1,035 m²; paved area ~510 m²; green area ~510 m²; total floor area ~12,980 m². Vertical circulation includes 2 stairs and 4 lifts (Figure III-5).

EXECUTIVE DEVELOPMENT CENTRE (EDC), **BUTEX**

BRIEF OF THE PROJECT

BUILDING TYPE - B1 (BNBC)
LAND AREA: 2050 SQM
GROUND COVERAGE : 1015 SQM
OPEN SPACE : 1035 SQM
PAVED AREA : 510 SQM
GREEN AREA : 510 SQM
NOS OF FLOORS : G+11, One Basement
STAIRS : 2
LIFTS : 4
ROAD : 18M (Front/South)

SETBACKS/ SEPARATION:
- NORTH : 3.0M (Back, inside)
- SOUTH : 5.5M (Front, road side)
- EAST : 7.0M (Road side)
- WEST : 13M (Future building Side)

FLOOR AREA:
- BASEMENT AREA : 1250 SQM
- GROUND FLOOR AREA : 1370 SQM
- TYPICAL FLOOR AREA : 1015 SQM(10 nos)
- ROOF FLOOR AREA : 210 SQM

TOTAL FLOOR AREA : 12,980 SQM

PARKING (1/200sqm) :50nos
CAR PARKING AT BASEMENTS: 31
MOTOR CYCLE PARKING: 08
BICYCLE PARKING: 20
SURFACE PARKING:19

FLOOR	AREA	FUNCTION
Basement floor 1	1250sqm	Parking/EME
Ground floor	780sqm	Entry lobby, TSC
Mezzanine floor	590sqm	Entry lobby/Plaza
1st floor	1015sqm	WPE Lab
2nd floor	1015sqm	Central Research Lab
3rd floor	1015sqm	4 Labs
4th floor	1015sqm	1Lab and 3Class Rooms
5th floor	1015sqm	1Lab and 3Class Rooms
6th floor	1015sqm	SICIP Office & Exam Hall
7th floor	1015sqm	Teacher's Office & Exam Hall
8th floor	1015sqm	Teacher's Room, Class Rooms
9th floor	1015sqm	Teacher's Room, Class Rooms
10th floor	1015sqm	Library
11th floor	1015sqm	Multipurpose Hall
Roof floor	210sqm	Solar panel/Garden
Grand Total	**12,980sqm**	

Figure III-5 Functionalities of the proposed EDC at BUTEX

66. **Materials and envelope features relevant to environmental performance.** The architectural brief specifies an RCC structural system (RCC slab/columns/beams) and describes façade glazing and shading elements (e.g., low-E grey-tinted exterior glazing; rain-protective louvers) and a roof provision for solar/garden, which can support improved rooftop thermal performance and reduce heat gain if implemented and maintained as designed (Figure III-5).

67. **Accessibility and Universal Design Provisions.** Accessibility for persons with disabilities is partially addressed in the current architectural design. The basement level is served by a dedicated 5 m wide vehicular/pedestrian access ramp at an 18% (1:8) grade connecting the ground-floor drop-off area to basement parking, and vertical circulation throughout the building — from basement to the 11th floor — is provided by two passenger lifts (21-person and 26-person capacity) positioned adjacent to each stair core on every floor, offering step-free access to all functional spaces including laboratories, classrooms, the library, exam halls, and the multipurpose hall. However, the drawings reviewed do not show an explicitly labeled accessible ramp at the main plaza-level building entrance, nor do they specify accessible toilet stalls, dedicated accessible parking bays, tactile/Braille wayfinding signage, or handrail specifications compliant

with barrier-free design standards. The IEE confirms that the building is designed to BNBC Type B1 occupancy standards, but a dedicated compliance check against BNBC Part 3, Section D (Barrier-Free/Accessible Design) provisions has not been documented in the reviewed architectural or IEE materials. It is recommended that the detailed engineering design stage include an explicit accessibility audit and design update — covering entrance ramp gradients, accessible sanitary facilities on each floor, designated accessible parking, and signage — to ensure full compliance with national accessibility codes and ADB's inclusive design expectations under the Safeguard Policy Statement.

D. Green Space Integration

68. Campus green/open space provision within the subproject site plan. The architectural schedule explicitly provides for green area (~510 m²) within the project site boundary, alongside open space (~1,035 m²) and paved area (~510 m²). This allocation indicates that the subproject is planned with a defined balance between built footprint, landscaped/green areas, and paved circulation/service zones (Figure III-6).

69. **Rooftop/upper-level greening provision.** The roof level (12th floor) incorporates two dedicated Roof Garden zones, each demarcated by a perimeter Roof Garden Wall, situated alongside the overhead water reservoir (OHWR), lift machine rooms, and roof utility spaces within the total roof floor area of approximately 210 m². This shared roof-level arrangement — combining garden zones with rooftop mechanical and solar infrastructure — is expected to contribute to localized microclimate benefits (shade and evapotranspiration) and support stormwater retention, provided the final detailing includes adequate growing-medium depth, waterproofing, drainage outlets, and structural load allowance for the planted areas (Figure III-6).

E. Site-Specific Wastewater and Sanitation Arrangements

70. The BUTEX campus lies within Dhaka WASA's Tejgaon service area (Revenue Zone-5), but Dhaka WASA's own sewerage network covers only about 20-30% of the DCC area, with the surrounding Tejgaon, Hatirjheel, and adjoining zones designated as part of the Dasherkandi sewage treatment plant catchment; however, sewer lines in this catchment are not yet directly connected to the Dasherkandi plant, and most collected wastewater across Dhaka is currently conveyed to the older Pagla treatment plant, which treats only around 10% of total city sewage generated (Dhaka WASA, 2023). Based on this citywide coverage pattern, it cannot be assumed that the BUTEX campus is connected to a functioning WASA sewer trunk line, and the existing IEE draft does not confirm whether current campus buildings discharge to a WASA sewer, an on-site septic tank/soak-pit system, or a combination of both. This section should therefore be revised following direct verification with BUTEX estate/maintenance staff and Dhaka WASA's Tejgaon zone office to establish: (i) the existing wastewater collection and conveyance arrangement serving current campus buildings (piped sewer connection versus on-site septic tanks and soak pits), (ii) the specific proposed connection method for the EDC building — whether it will tie into an existing campus sewer main leading to a WASA trunk sewer, or require a new on-site treatment system (septic tank, soak pit, or package treatment plant) sized for the building's projected occupancy and wastewater generation, and (iii) a capacity adequacy check confirming that the receiving system (WASA sewer or on-site facility) can accommodate the EDC's additional wastewater load without surcharging, backflow, or exceeding treatment/percolation capacity, particularly given the building's basement level and twelve-story occupancy. Until such site-

specific verification is completed and documented, the IEE should explicitly flag wastewater conveyance and treatment as a data gap requiring resolution during detailed engineering design, rather than relying on generic Dhaka-megacity sanitation statistics as a proxy for actual on-site conditions

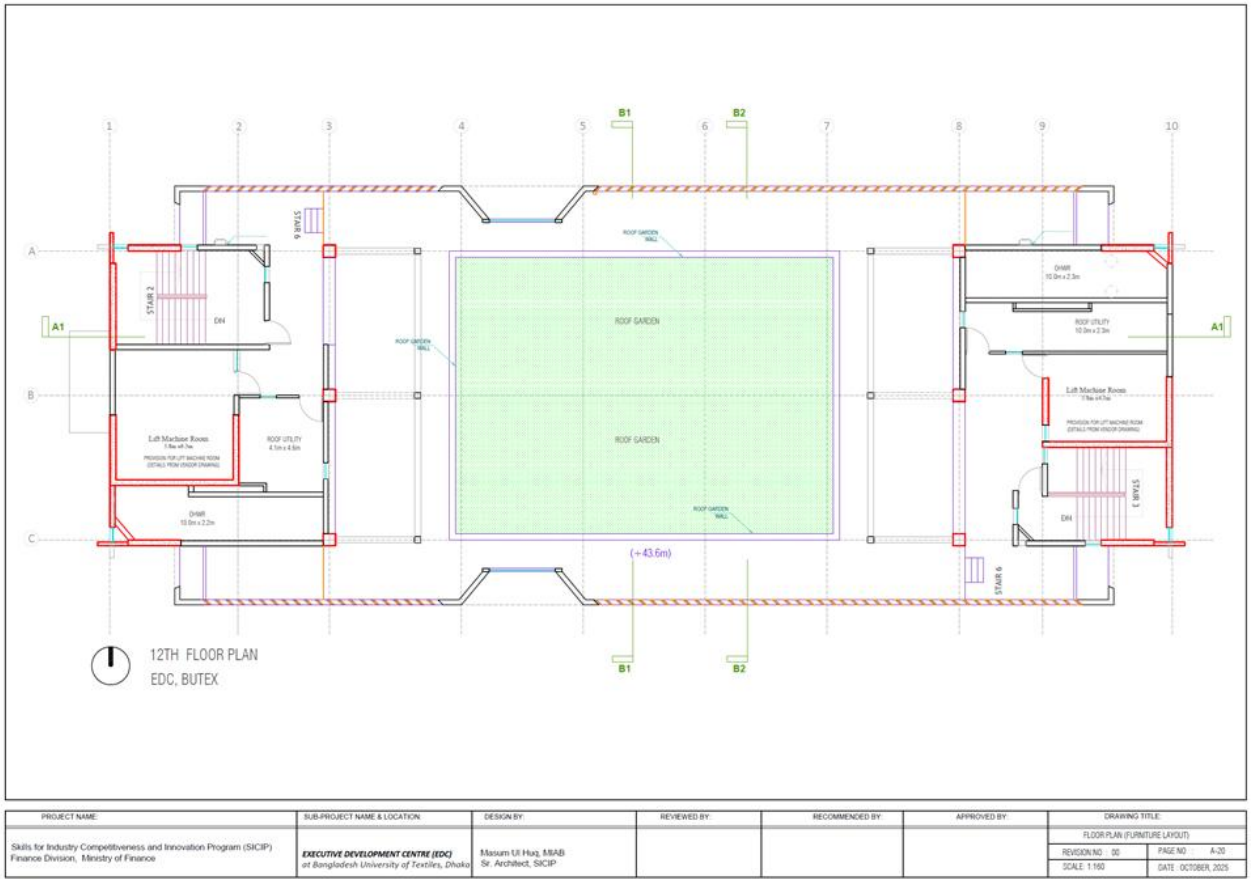


Figure III-6 Rooftop Green Space of the proposed BUTEX EDC building

urce: Detailed Architectural Design.

F. Climate Considerations and Passive Design

71. **Design intent features that support Dhaka's hot-humid climate response.** The EDC drawings include envelope elements (low-E glazing; louvers; specified exterior finishes/coatings including heat/damp protective roof coating) and roof solar/garden provision. These features, when properly detailed and maintained, are consistent with typical passive/low-energy strategies used to reduce solar heat gain and improve indoor comfort in Dhaka's climate (Figure III-7).

1. Natural Ventilation Systems

72. Cross-Ventilation Strategy. The architectural layout prioritizes natural ventilation through strategic placement of openings and ventilation corridors. Each floor features a central corridor system (typically 1.8-2.1 meters wide) that facilitates air movement between north-facing and south-facing openings, creating effective cross-ventilation pathways. The open plaza area at the

ground floor (14.7m × 16.8m) and mezzanine floor (18.5m × 15m) serve as a ventilation plenum, channeling cool air upward through the building.

73. Vertical Air Movement. Two primary staircases (Stair 2 and Stair 3) function as thermal chimneys, with exhaust fans positioned at 2200mm height to facilitate vertical air movement and stack effect ventilation. The central lift lobbies (6.8m × 6.1m on mezzanine and 8.0m × 3.2m on typical floors) create vertical voids that enhance buoyancy-driven natural ventilation.

2. Solar Shading and Heat Reduction

74. **RCC Fin Shading System (Screen-1).** The south facade employs an innovative RCC (reinforced cement concrete) fin shading system consisting of 19 individual fins per row, each measuring 400mm × 90mm. The fins are arranged with progressive rotation from 0° to 90° in 5-degree increments at 600mm center-to-center spacing. This parametric shading design optimizes solar protection while maintaining views and natural daylight. The fins are constructed using fair-faced colored concrete (cast in-situ or precast), creating a dynamic facade that responds to the solar angle throughout the day.

75. **RCC Screen-2 System.** The east and west facades utilize RCC Screen-2, featuring 6 fins per row measuring 300mm × 100mm, each rotated 65° and spaced at 300mm centers. This denser configuration addresses the low-angle morning and afternoon sun characteristic of tropical climates, which poses the greatest heat gain challenge.

76. **Horizontal Shading Elements.** The building incorporates multiple horizontal shading devices: (i) Deep window reveals (minimum 300mm) on all exterior walls; (ii) Projecting RCC slabs at floor levels creating continuous horizontal shading bands; (iii) Fair-faced colored concrete fins providing self-shading through surface relief; (iv) Recessed glazing protected by aluminum louvers with rain protection.

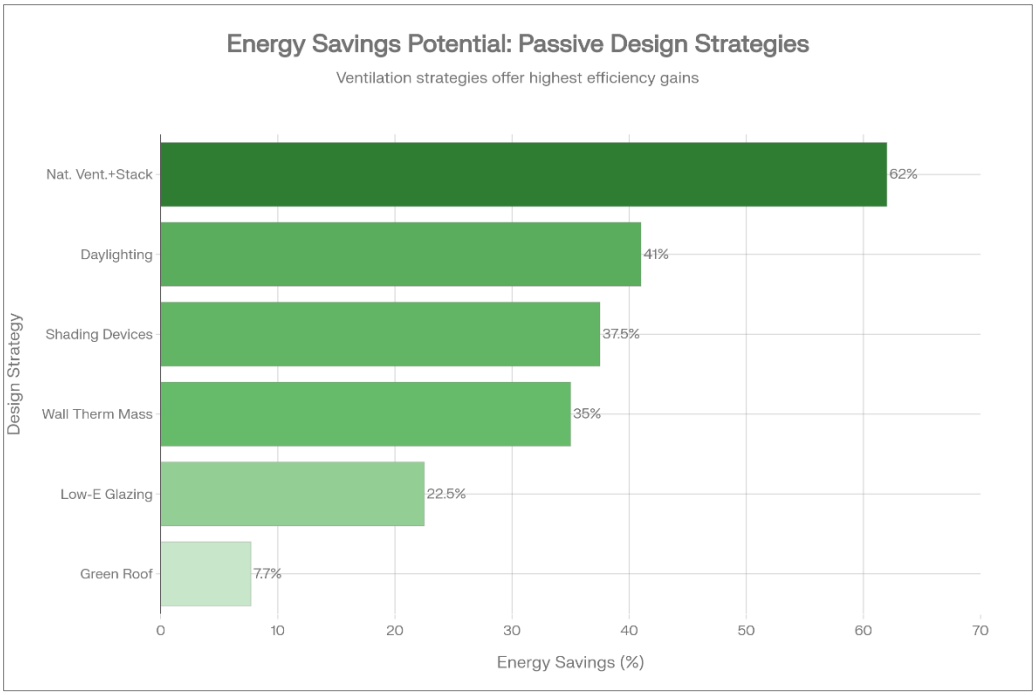


Figure III-7 Energy Savings potential of BUTEX EDC building

Source: Calculated from Detailed Architectural Design

3. Glazing and Thermal Performance

77. **High-Performance Glazing System.** All exterior glazing on the facade employs low-emissivity (low-E), 6-8mm thick gray-tinted glass equivalent to Saint-Gobain SGG Graphite. This specification provides: (i) Reduced solar heat gain coefficient (SHGC) minimizing cooling loads; (ii) Enhanced thermal insulation (low U-value); (iii) Glare reduction while maintaining adequate daylight transmission; (iv) UV protection reducing material degradation and occupant exposure

78. **Curtain Wall System.** The building utilizes an aluminum curtain wall system with light bronze finish on exterior frames. The system incorporates: (i) Fixed and EDF (exterior drainage feature) sliding sections; (ii) Thermal breaks in aluminum framing reducing conductive heat transfer; (iii) Horizontal caps protecting against driving rain; and (iv) Integrated drainage channels preventing water infiltration

79. **Interior Glazing.** Interior windows and louvers utilize 5mm clear glass, while interior glass partitions employ 10mm tempered glass. This differentiation optimizes daylighting distribution while maintaining spatial flexibility and acoustic separation where required.

G. Drainage and Water Management Infrastructure

80. The BUTEX Executive Development Centre incorporates a comprehensive drainage and water management system designed to address Dhaka's tropical monsoon climate, where annual rainfall averages 1,854 mm with approximately 80% concentrated during the May-September monsoon season (Bangladesh Meteorological Station, Dhaka Station). The building's multi-tiered water management strategy begins at the basement level (-3.0m) with an underground water reservoir and pump room located beneath the 1,250 sqm parking area, as specified in the architectural drawings and EME (Electrical, Mechanical, and Environmental) system plans. This below-grade infrastructure provides critical water storage capacity while maintaining functional separation from vehicular circulation through strategically positioned utility spaces and dedicated plumbing ducts integrated throughout the structural framework at 616mm intervals on typical floors. The basement drainage system accommodates both groundwater infiltration and stormwater runoff from the 5-meter wide access ramp (1:8 slope) and surface parking (1:20 slope), with collection channels directing flow to the central reservoir system where pumps facilitate distribution to upper floors and emergency fire suppression systems. Finally, the drainage system will be connected to the main campus drainage system which discharges to the connected municipal drainage system.

81. Surface-level stormwater management at the BUTEX EDC emphasizes sustainable drainage principles through a combination of permeable and impermeable surface treatments across the 2,050 sqm site. The landscape design allocates 510 sqm (25% of total site area) to green areas providing natural infiltration and evapotranspiration, with an additional 510 sqm designated as paved surfaces incorporating drainage infrastructure detailed in the landscape section (Drawing A-81). The ground floor plaza area features a sophisticated drainage network with RCC (Reinforced Cement Concrete) drains positioned beneath 30×30mm MS (Mild Steel) grating, designed for H20 traffic loading to accommodate both pedestrian and vehicular access at drop-off points. Each drain inlet includes a 200mm concrete apron sloped at 2% grade toward collection points, ensuring rapid conveyance of surface water away from building entry zones and the 14.7m × 16.8m TSC (Teacher-Student Centre) plaza. The 5-meter wide periphery road incorporates precast concrete or RCC block curbing with kerbstone borders and 200-300mm

compacted sand-khoa base, directing runoff toward strategically positioned inlets that connect to the underground drainage network.

82. The building's vertical drainage system integrates plumbing ducts at consistent 616mm × 616mm dimensions extending through all twelve floors, providing dedicated chases for rainwater downpipes, sanitary drainage, and vent stacks as indicated on slab outline plans (Drawings A-22 through A-33). This modular approach ensures maintenance accessibility while segregating potable water supply from wastewater systems in compliance with Bangladesh National Building Code (BNBC) standards for B1 occupancy classification. The toilet blocks on each floor (detailed in Drawing A-75) incorporate independent drainage systems with 4-inch floor drains and 100mm trap water seals, with dedicated exhaust fans (EX FAN) positioned at 2,200mm above finished floor level to maintain negative pressure and prevent sewer gas migration. Storm drainage from AC outdoor units (positioned on floors 1-2, 6-7, and 10-11) connects to separate condensate lines preventing cross-contamination with sanitary waste, while roof-level utilities (Drawing A-20) include multiple overhead water reservoirs (OHWR) serving gravity-fed distribution to lower floors with overflow provisions directing excess water to the primary drainage network.

83. **Laboratory Facilities.** The proposed EDC building at BUTEX will house a range of textile-testing and research laboratories distributed across the 1st, 2nd, 3rd, 4th and 5th floors, comprising a Pretreatment and Dyeing Lab, Printing Lab, Finishing Lab, and Analytical Lab on the 1st floor (each approximately 6.0m x 9.8m, with the Analytical Lab at 18.8m x 7.5m), a Central Research Lab spanning six sections on the 2nd floor, four general-purpose laboratories (13m x 6.6m each) on the 3rd floor equipped with fume hood cabinets, and a Textile Design and Testing Lab on the 4th/5th floor. These facilities will support routine wet-processing and analytical activities typical of a textile engineering program, including dyeing, printing, and finishing trials using dyes, chemical auxiliaries, and solvents; sample pretreatment and analytical testing involving acids, bases, and reagents for quality control; and instrumentation-based material characterization. Consequently, anticipated waste streams will include hazardous liquid effluents (spent dyebaths, chemical rinses, solvent residues), hazardous solid wastes (contaminated packaging, used filters, expired reagents, chemical containers), and non-hazardous general laboratory waste (paper, glassware, packaging). A dedicated Laboratory Waste Management Plan, to be developed by a qualified laboratory design specialist during detailed design, will specify segregated collection points at source, temporary hazardous waste storage with secondary containment, and a treatment or pretreatment arrangement—such as an effluent neutralization/pretreatment unit prior to discharge, in compliance with the Environment Conservation Rules 2023 Schedule 10 (Inland Surface Water) standards—together with defined protocols for handling, internal transport, and off-site disposal through licensed hazardous waste contractors.

H. Construction schedule

84. Estimated construction schedule has been given in Figure III-8.

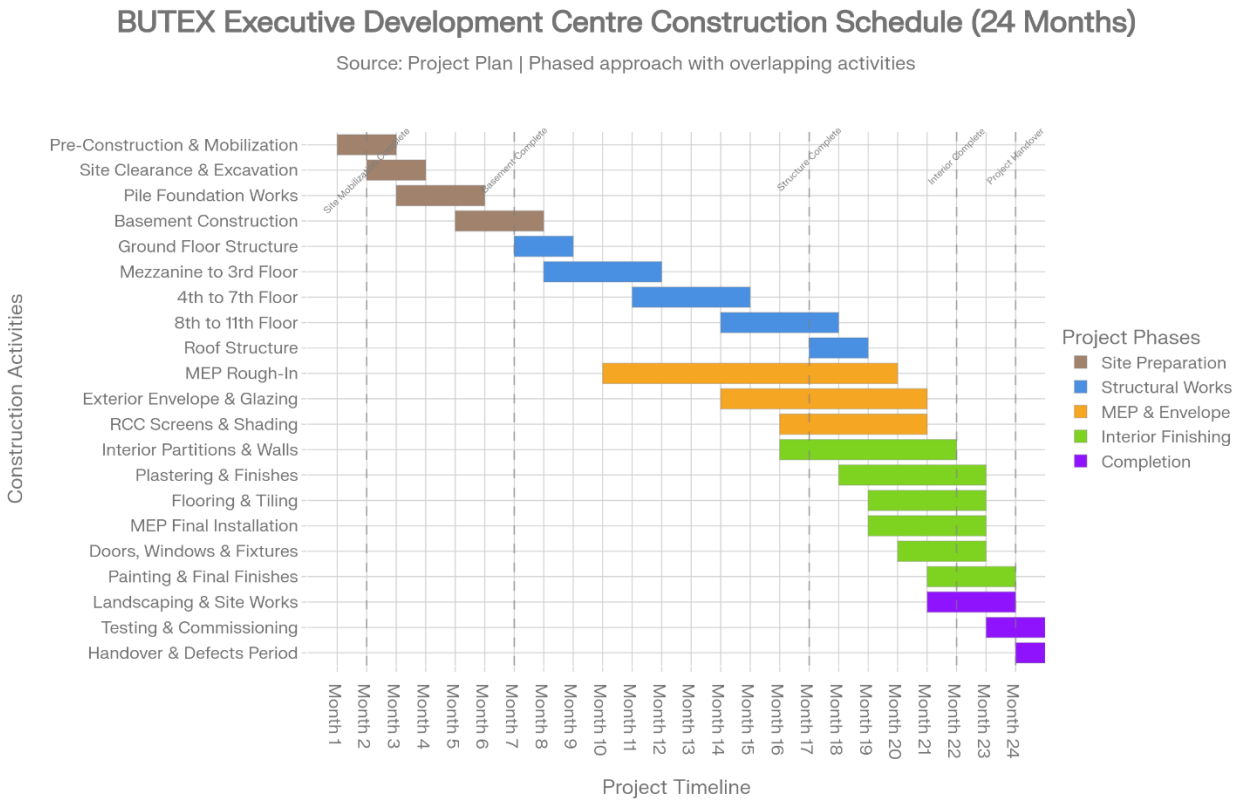


Figure III-8 Estimated construction Schedule of the construction project

Source: TA consultant

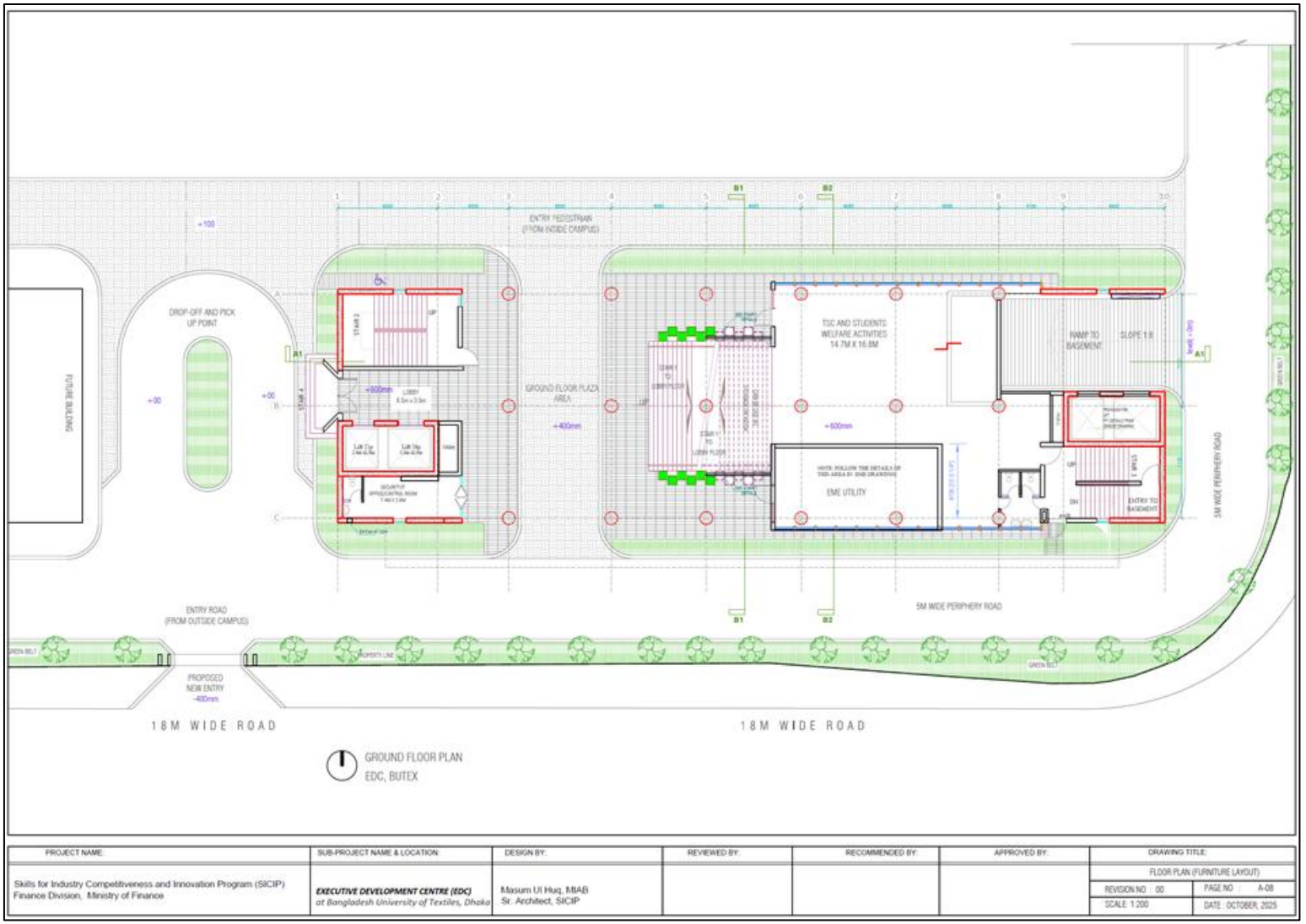


Figure III-9 Ground floor Layout of the proposed EDC BUTEX building complex

Source: Detailed Architectural Design

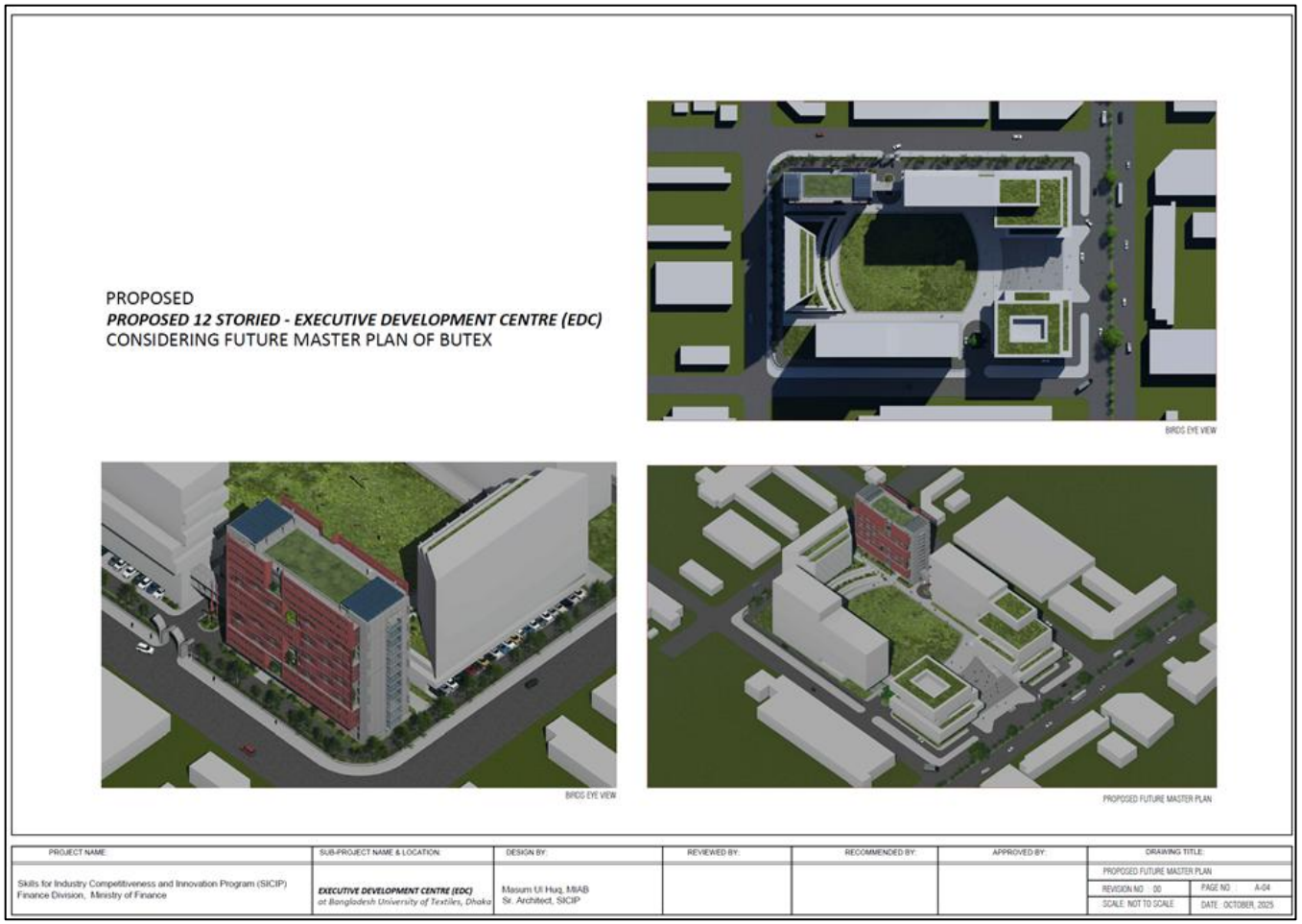


Figure III-10 3-d setting of the EDC BUTEX building

Source: Detailed Architectural Design

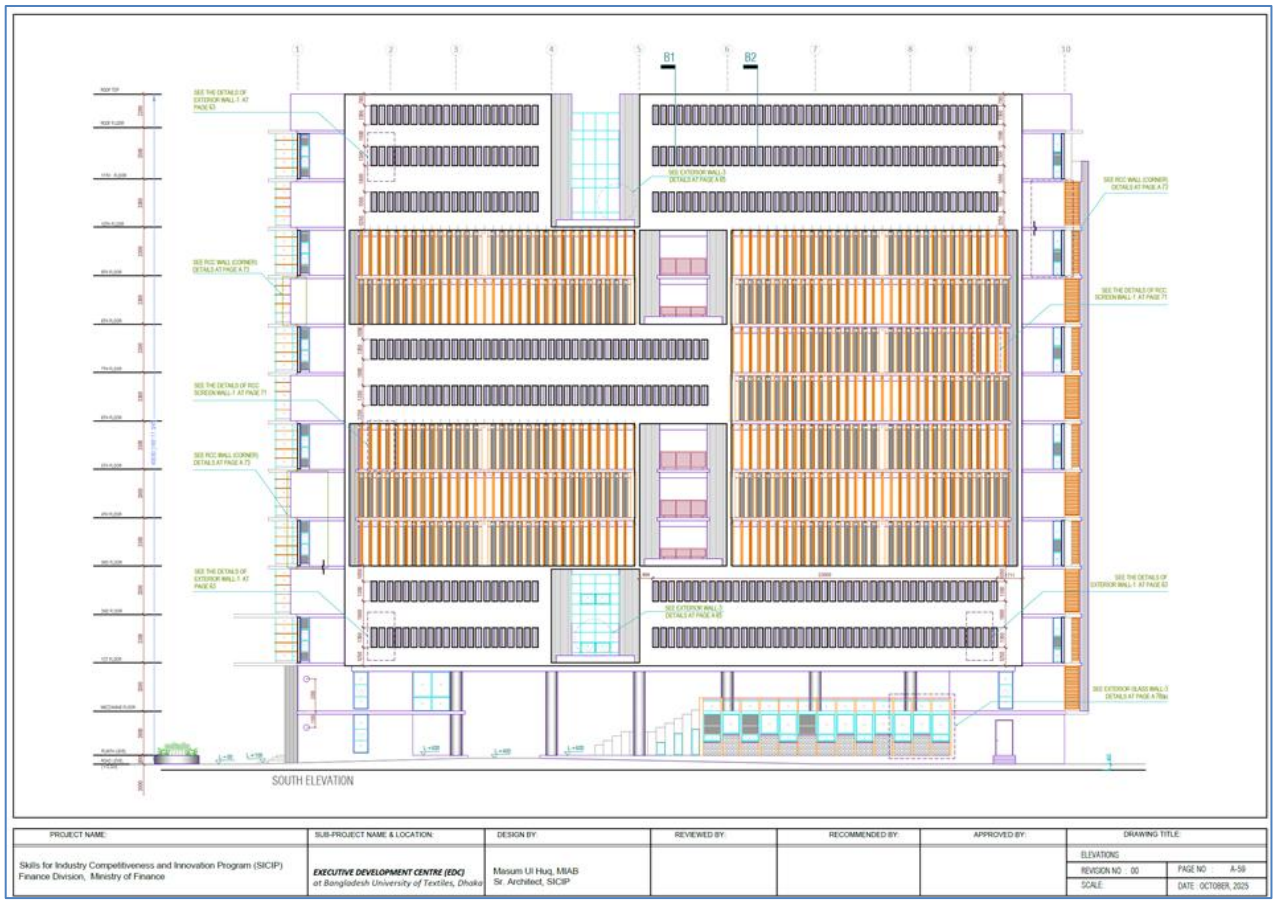


Figure III-11 South elevation of the proposed EDC BUTEX building

Source: Detailed Architectural Design

Figure III-12 3-D view of the proposed EDC BUTEX building indicating green space arrangement and passive cooling system

Source: Detailed Architectural Design

IV. BASELINE ENVIRONMENT

A. Location setting

85. **Siting.** The proposed subproject (Executive Development Centre—EDC) will be implemented within the existing Bangladesh University of Textiles (BUTEX) campus at 92 Shaheed Tajuddin Ahmed Avenue, Tejgaon Industrial Area, Dhaka-1208 (Figure IV-1). The campus is in a highly urbanized mixed industrial–commercial–institutional setting of Dhaka, and Shaheed Tajuddin Ahmed Avenue functions as a major thoroughfare through Tejgaon Industrial Area. The immediate surroundings include dense built-up development, internal campus buildings and open activity spaces; therefore, baseline sensitivities relate mainly to construction nuisance (dust/noise), traffic/access management, and drainage/waterlogging risks during monsoon rather than natural habitat disturbance (Figure IV-1).

Figure IV-1 Location of the proposed EDC building at BUTEX

Source: Map produced by TA consultants based on Google Earth Image

86. **Connectivity.** BUTEX is well connected to Dhaka's transport network through Shaheed Tajuddin Ahmed Avenue and adjacent arterial roads. The campus is served by public buses/para-transit and also benefits from proximity to mass transit: MRT Line-6 stations such as Karwan Bazar are operational (Figure IV-2). In addition, the site is close to key rail-linked activity nodes in Tejgaon (e.g., Tejgaon Railway Station in the vicinity), supporting commuter access. BUTEX also operates institutional transport routes for staff/students, indicating regular planned campus connectivity.

B. Physical Environment

1. Landform

87. Topography of BUTEX region of Dhaka is flat in nature, as the surface area ranges between 12 and 14 metres (calculated from topographic map[12]). In general, the surface elevation of the area Dhaka are ranges between 1 and 14m and most of the built-up areas located at elevations of 6-8m. The land area above 8 meters msl covers about 20 square kilometers. The land ranging from 6-8 meters while 170 square kilometers of Greater Dhaka is below 6 meters (FAP 1991[13]). See Figure IV-2 for topographic relief of the project region.

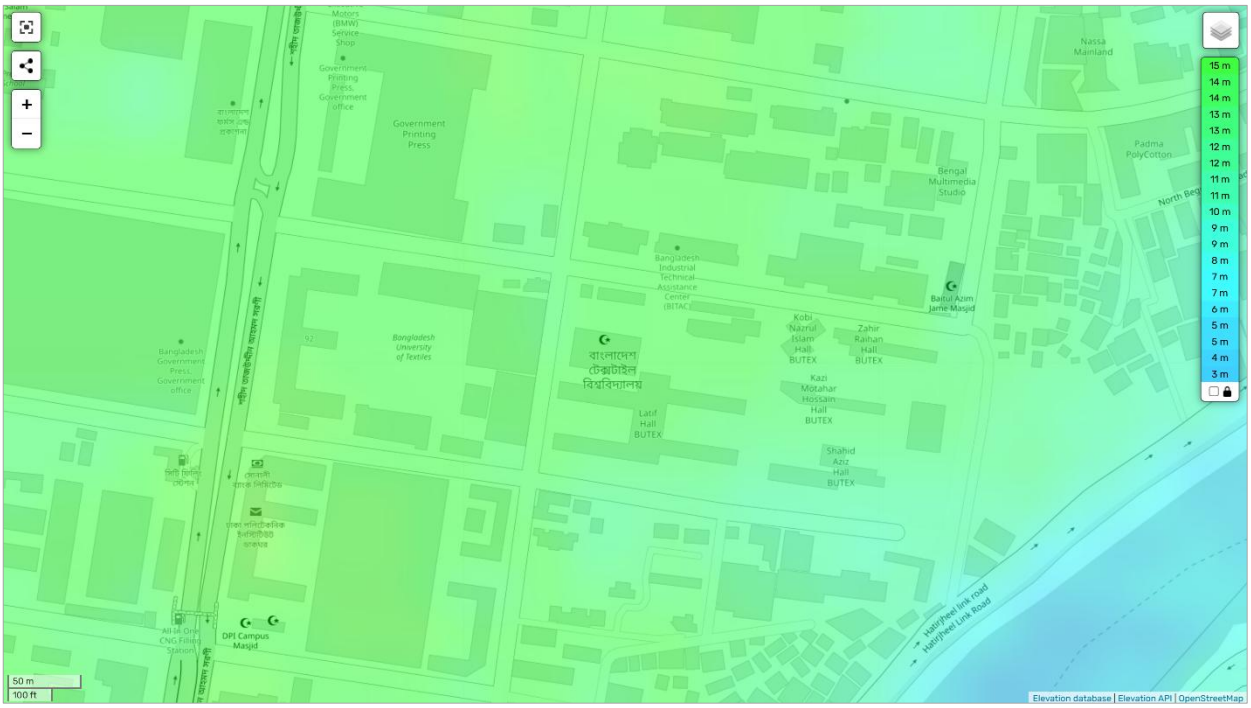


Figure IV-2 Topographic relief of BUTEX region.

Source: https://en-gb.topographic-map.com/maps/lpj4/Dhaka

88. The BUTEX EDC site lies on developed, generally flat urban land within the Tejgaon area. Based on the elevation layer shown in Figure IV-3, the surroundings of Butex Rd / Begunbari Rd are predominantly in the 12–20 m elevation band, with pockets of lower elevation (4–12 m) occurring locally and more prominently toward the Hatirjheel waterbody/drainage corridor. Accordingly, the project location is not situated in the lowest depressions adjacent to Hatirjheel, but the nearby low-lying zones indicate potential for localized waterlogging/ponding during intense monsoon rainfall unless site drainage and outfall connectivity are kept functional (Figure IV-3).

[12] Web: https://en-gb.topographic-map.com/maps/lpj4/Dhaka/, date accessed: 11 June 2021
[13] FAP. (1991). Master Plan Study for Greater Dhaka Protection Project. In Flood Action Plan. Dhaka: Japan International Cooperation Agency

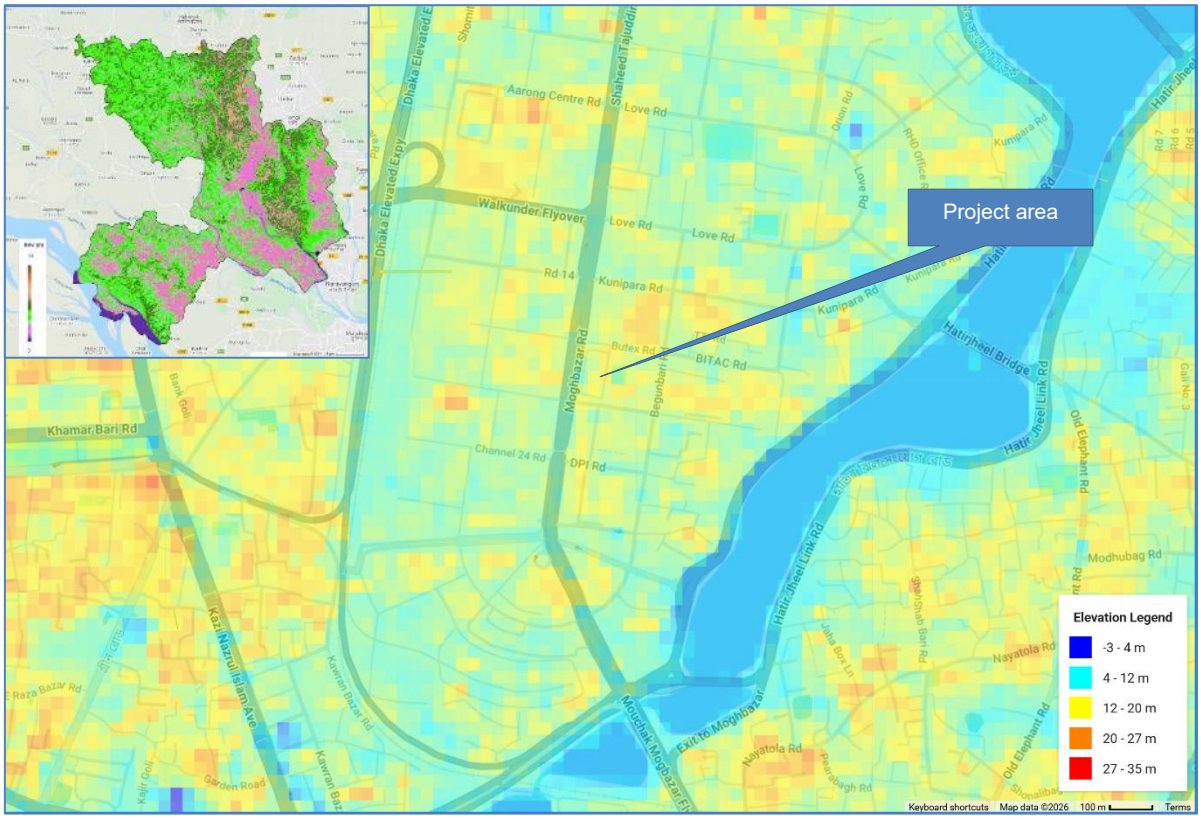


Figure IV-3 DEM map of the project area.

Source: TA consultants using GEE and CGIAR/SRTM90_V4 data

2. Geology and geomorphology

89. **Geology and geomorphology.** Dhaka has developed over two broad Quaternary physiographic settings: (i) the elevated Pleistocene terrace (commonly referred to as the Dhaka/Madhupur terrace system) and (ii) the surrounding low-lying Holocene floodplains. Within the metropolitan area, the principal geomorphic elements include the higher terrace surfaces, floodplains, as well as depressions/abandoned channels and associated low-lying swamps and marshes, which collectively control local drainage behavior and waterlogging susceptibility during monsoon periods (Banglapedia, 2021[14]).

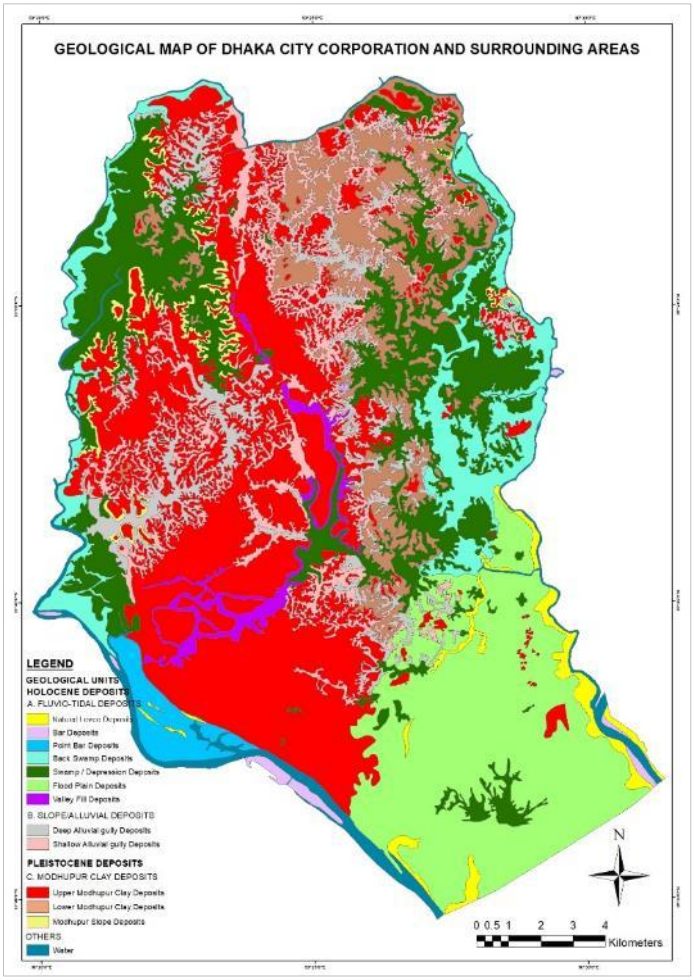


Figure IV-4 Geological map of Dhaka city and surrounding areas (Source: GSB, URL: http://www.gsb.gov.bd/)

90. At the city scale, Dhaka's near-surface geology is commonly differentiated into multiple units that reflect terrace versus floodplain deposition and subsequent urban modification. A widely used classification divides the surface/subsurface materials into six units: Pleistocene terrace deposit, Holocene terrace deposit, Holocene alluvial valley fill deposit, Holocene alluvium, Holocene channel deposit, and artificial fill (Rahman et al., 2018)[15]. In engineering terms, terrace deposits are generally represented by stiffer clayey soils (often described as over consolidated Pleistocene deposits), while floodplain deposits are typically softer alluvial sandy–clayey sequences, with local variability driven by former channels and lowland infills (Rahman et al., 2018). Regional Quaternary stratigraphic interpretations for the Bengal Basin, including terrace–floodplain development, are consistent with classic basin-scale syntheses (Morgan & McIntire, 1959[16]).

91. For the BUTEX EDC site in Tejgaon, the baseline understanding is that the ground conditions are representative of highly urbanized Dhaka terrain, where subsurface profiles may include (depending on micro-location) terrace-related clayey units and/or Holocene alluvial sequences, with anthropogenic fill present in developed areas. City-scale urban geology references also note that Madhupur Clay commonly acts as an important low-permeability unit in Dhaka's subsurface context, with underlying sand aquifers of the broader Dhaka stratigraphy

[14] https://en.banglapedia.org/index.php/Dhaka%2C_Geology
[15] https://ideas.repec.org/a/spr/nathaz/v92y2018i3d10.1007_s11069-018-3266-3.html
[16] https://pubs.geoscienceworld.org/gsa/gsabulletin/article-abstract/70/3/319/5092/QUATERNARY-GEOLOGY-OF-THE-BENGAL-BASIN-EAST

(UNESCAP, 1999[17]). Hydrogeological work for Dhaka further describes the role of Madhupur Clay in controlling vertical leakage/recharge to the underlying aquifer system (Hasan, 1999)[18].

3. Seismicity

92. Bangladesh is divided into 3 seismic zones based on the vulnerability to earthquakes and possible severity of damages. In all the classifications Dhaka city and its surroundings are shown to be situated in the seismic zone 2, the medium risk/hazard zone (Figure IV-5). According to Earthquake Disaster Risk Index (EDRI) parameters Dhaka is one of the top twenty high earthquake risk cities in the world (Cardona, Davidson and Villacis 1999[19]). Dhaka is slightly elevated above the surrounding floodplains and represents mostly flat land with minor undulations. Topographically Dhaka is of low relief with many low depressions. According to Alam (1988)[20], the Madhupur Tract is structurally controlled. The Pleistocene sediments of Madhupur Tract have been affected by numerous episodes of faulting. These faults are probably the branch out surface faults from the low dipping western extension of Burma Arc detachment fault. Dhaka lies within 50 to 500 km distances from the seismogenic faults and sits on the Burma Arc detachment fault. Dhaka city falls in seismic zone II of the seismic zoning map of Bangladesh (Figure IV-5).

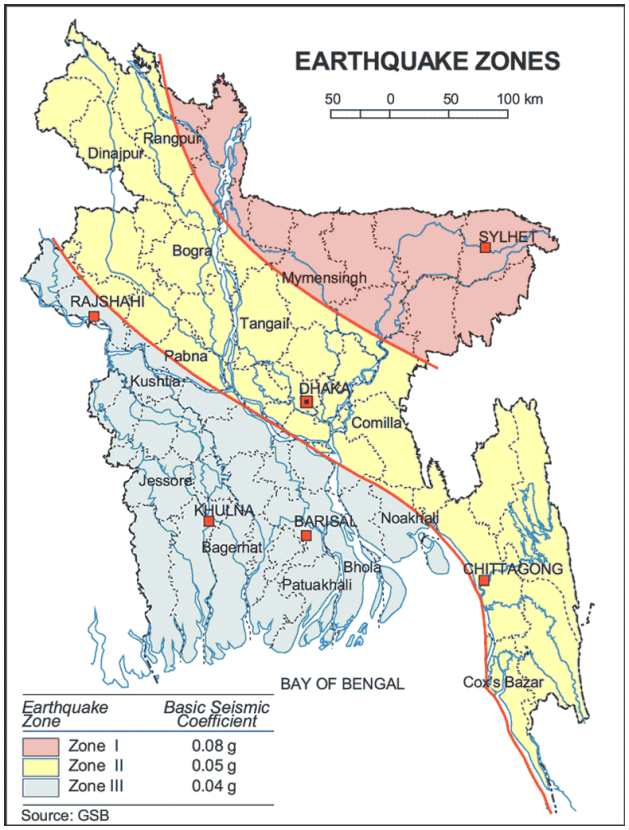


Figure IV-5 Seismic zoning map of Bangladesh (Source: GSB, URL: http://www.gsb.gov.bd/))

4. Hydrology and drainage

93. **Regional river systems.** Dhaka city is bounded by four major river systems: the Buriganga River to the south, the Turag River to the west (connected to the Tongi Khal in the north), and the Balu River to the east (also hydrologically linked to the Tongi Khal). These rivers form the primary receiving water bodies for the city's stormwater and wastewater discharge and are hydrologically relevant to the BUTEX site as the ultimate downstream destination of runoff from the Tejgaon area.

94. **Site-level and local drainage conditions.** The BUTEX campus is located in the Tejgaon area, where the municipal drainage network is comparatively well developed and connected to the citywide system, unlike several peripheral wards of Dhaka where drainage coverage remains

[17] https://repository.unescap.org/bitstreams/1a8eb19c-33d5-4f63-80cf-fa2162ccb638/download
[18] https://search.proquest.com/openview/9217f114bac280abd71abbf4f6541ade/1.pdf
[19] Cardona, C., R. Davidson and C. Villacis. (1999). Understanding urban seismic risk around the world: A final report on the comparative study. A project of the United Nations RADIUS initiative, IDNDR, Geohazard International
[20] Alam, M K. (1988). Geology of Madhupur Tract and its adjoining areas in Bangladesh. Records of the Geological Survey of Bangladesh. Vol. 5, pt. 3. p.18.

poor. The proposed EDC site drains into the adjacent roadside drainage system, which in turn discharges into designated retention and detention areas, including nearby khals (canals), before eventually reaching the surrounding rivers. This existing connectivity is an important consideration for the detailed drainage design of the EDC building, since any additional impervious surface or paved area introduced by the project should be matched with adequate on-site retention or infiltration capacity to avoid overloading this shared municipal system.

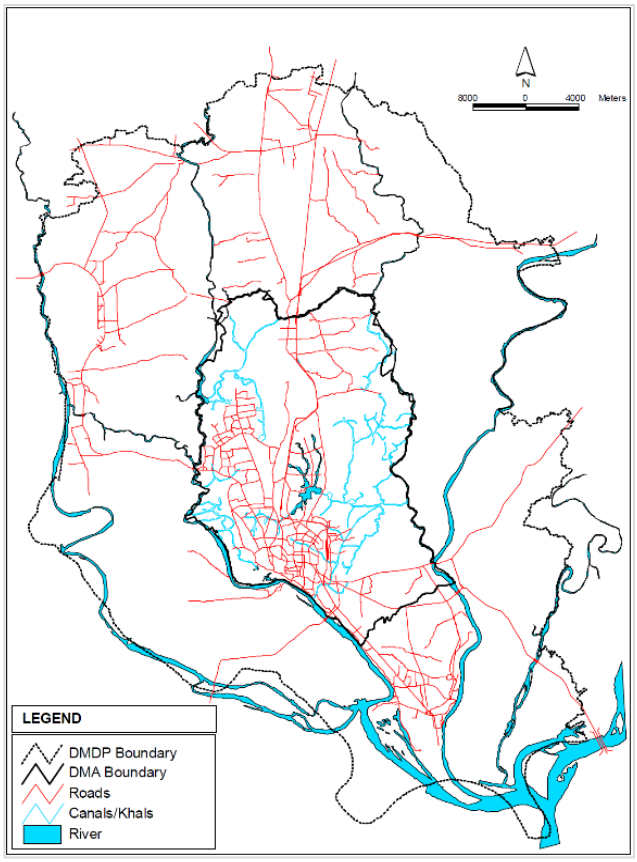


Figure IV-6 **Natural drainage system of Dhaka city. Adapted from Tawhid (2004), data from DMDP, 1995**

95. **City-wide surface water and canal network.** Surface water bodies cover roughly 10-15% of Dhaka city's total land area, with major lakes including Dhanmondi Lake, Ramna Lake, Gulshan Lake, and Crescent Lake. Historical surveys identified more than 35 canals within Dhaka city (Khan, 2001), though many have since deteriorated or vanished due to encroachment and infilling; canals still functioning as open channels include Begunbari Khal, Abdullahpur Khal, Diabari Khal, Manda Khal, Digun Khal, Meradia-Gazaria Khal, and Kallyanpur Khal (DoE, BCAS and UNEP, 2006). The Begunbari Khal is of particular relevance to the BUTEX area, as it forms part of the natural drainage corridor serving the Tejgaon-Karwan Bazar zone.

96. **City-wide drainage network and historical decline.** Dhaka's natural drainage system relies on a network of retention and detention areas linked to khals, which convey accumulated rainfall to the surrounding rivers; approximately 80% of the city area is drained through these channels. Dhaka West contains 13 khals with a combined length exceeding 31 km and catchment areas ranging from 6 to 40 sq. km, while Dhaka East contains 27 khals totaling about 60 km in length (Chowdhury, 1988). This network has been significantly degraded over time — most notably the Dholai Khal, once a key navigational route for country boats, which has nearly disappeared due to decades of road construction over the canal (Huq and Alam, 2003), with far-reaching consequences for the city's overall drainage capacity and flood resilience, including in areas such as Tejgaon that depend on this interconnected khal system.

97. **Wetland loss.** If the current rate of loss of wetland continues, before the year 2031 all temporary wetlands of Dhaka will disappear (Chowdhury 1988). This is alarming for earthquake scenario; all these lands are continuously being converted into urban land through landfill and these filled lands are vulnerable to liquefaction effect. Even after the enactment of the water body conservation act 2000, the city has lost huge number of wetlands (Anisha and Hossain 2014).

98. In Dhaka city and its surroundings wetland arena (e.g., canals, lakes etc.) are disappearing at a rapid rate. According to the study of Mahmud et al. (2011) total 18.72 km^2 of rivers and Khals were lost during this 30-year interval from 1978 to 2009 which was about 64.55% of Dhaka Metropolitan Area (DMA). They depicted that an ever-increasing trend of wetlands loss is found in DMA between 1978 and 2009. See Figure IV-7 for a comparative analysis of wetland loss in Dhaka city.

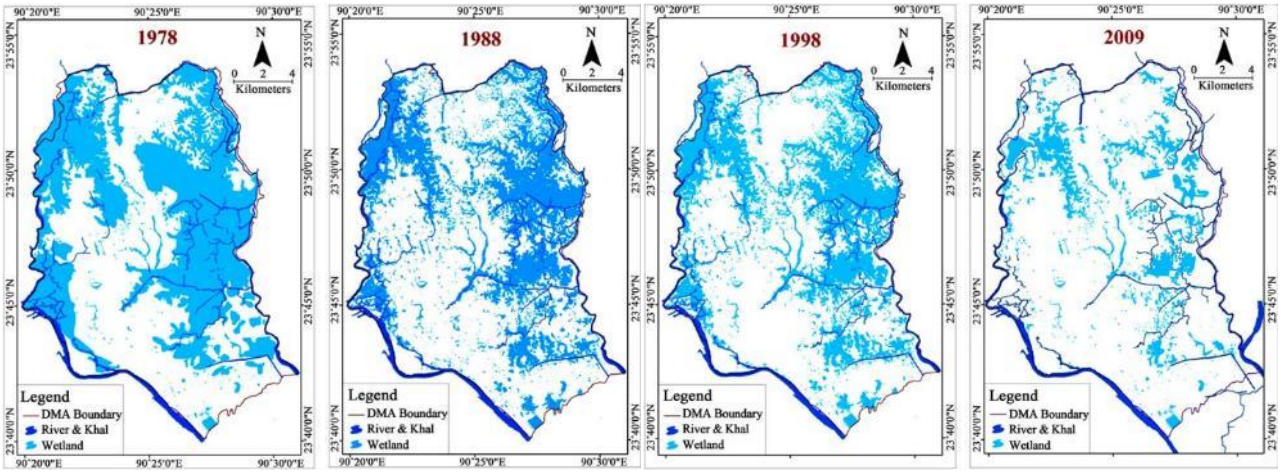


Figure IV-7 Trend of Dhaka's disappearing wetlands (Source: Mahmud et al. 2011)

5. Ground water table

99. The maximum depth to water table in the central part of the city i.e., Tejgaon and Sabujbagh areas, observed from BWDB piezometers, is about 67 to 57m below ground surface that is about 55m at Mirpur and 20-34m at Mohammadpur, Dhanmondi and Sutrapur areas close to the river periphery. The depth of the water table moves seasonally with annual recharge and discharge conditions. The amount of seasonal fluctuations varies from less than a meter to more than 10m depending on the local hydrological conditions, amount of ground water abstraction and natural discharge of ground water. In recent years, there is a declining trend in the water table due to large amount of ground water withdrawal (Bangladesh Water Development Board, 2007[21]).

100. In Dhaka City, Ground Water extraction started from a depth of 100m and in some extreme condition the well goes up to 300 meters to reach the main aquifer. The depletion rate varies from area to area as in Mirpur the ground water level dropped 53.75 meters between 1991 and 2008 at a rate of 3.2m per year. While the decline was 1.1m/y in Mohammadpur, 2.2m/y in Sabujbag, 0.5m/y in Sutrapur and 0.8 m/y in Dhaka Cantonment During the same period. The city's groundwater level has dropped about 20m over the last seven years at a rate of 2.81m per year, from the year of 2000, the rate is increasingly high.

101. Long term hydrographs from different parts of Dhaka city indicate the drop-in water level is increasing very rapidly throughout the city. For assessing hydrographs, eight groundwater monitoring stations of BWDB and BADC have been selected at different locations i.e., Gulshan, Sabujbagh, Lalbagh, Sutrapur, Mohammadpur, Dhanmondi, Tejgaon and Mirpur (BWDB 2007).

[21] BWDB (2007). Effects of Over Withdrawal of Groundwater in Dhaka City. Dhaka: Bangladesh Water Development Board.

102. The maximum depth to water table in the central part of the city i.e., Tejgaon and Sabujbagh areas, observed from BWDB piezometers, is about 67 to 57m below ground surface that is about 55m at Mirpur and 20-34m at Mohammadpur, Dhanmondi and Sutrapur areas close to the river periphery. This continuous decline of water table with little or even no fluctuation is typical of over exploited aquifers (BWDB 2007).

103. The declining rate of groundwater level is alarming as well at Tejgaon (60.42 m), Gulshan (62 m), and Sabujbagh (58.75 m). In these areas the water abstraction rate is higher than the recharge. The level of groundwater table of upper aquifer (<170 m depth) is declining about 2-3meter in every year. The overall groundwater level in the city is below 50 m (DWASA 2006[22])

104. In Dhaka City, Ground Water extraction started from a depth of 100m and in some extreme condition the well goes up to 300 meters to reach the main aquifer. The depletion rate varies from area to area as in Mirpur the ground water level dropped 53.75 meters between 1991 and 2008 at a rate of 3.2m per year. While the decline was 1.1m/y in Mohammadpur, 2.2m/y in Sabujbag, 0.5m/y in Sutrapur and 0.8 m/y in Dhaka Cantonment During the same period. (The Daily Star, 2010). The city's groundwater level has dropped about 20m over the last seven years at a rate of 2.81m per year, from the year of 2000, the rate is increasingly high.

6. Flooding and waterlogging

105. Over the past few decades, Dhaka and its adjoining peri-urban areas have experienced increasing exposure to both riverine flooding and rainfall-driven urban flooding, with associated damage to housing, infrastructure, and livelihoods (Dewan, 2007[23]; GFDRR, 2021[24]). Dhaka has a long record of major flood events, including the large floods of 1954/1955, 1970, 1974, 1980, 1987, 1988, 1998, and 2004, which collectively shaped the city's flood risk management priorities (Barua, 2008[25]). The 1998 flood remains one of the most severe in recent history; published assessments report approximately 262,000 houses damaged in Dhaka with losses estimated at about BDT 2.3 billion, together with extensive damage to urban road surfaces, culverts, and sewerage/drainage assets (Islam, 1998, as cited in Mirza, 2002[26]).

106. In the events of recurring floods in Dhaka city, experts attributed to these devastating occurrences as a combined effect of seasonal monsoon rainfall due to climate change (Gain et al. 2011) and upstream flow due to trans-boundary water governance (Gain and Schwab 2012). The western part of Dhaka city is heavily protected by embankment constructed after the flood of 1988. The embankment offers some protection against flooding. However, the eastern part of the city gets flooded annually. During the most recent flood of Bangladesh in 2019, the city also suffered, although not so heavily. The flooding occurred mostly in the eastern part of the city (Figure IV-8) since this low-lying floodplain area is still unprotected.

107. Apart from rainfall and upstream flow issues, flooding is also attributed to the improper and poor internal drainage system of Dhaka caused by uncontrolled urbanization (Mawla and Islam 2013). The drainage problem often leads to waterlogging in Dhaka city which are often

[22] DWASA (2006). Annual Report 2004-2005. Dhaka: Dhaka Water and Sewage Authority.
[23] Dewan, A. M. (2007). Evaluating flood hazard for land-use planning in Greater Dhaka of Bangladesh using remote sensing and GIS techniques. Water Resources Management, 21(9), 1601–1612.
[24] Global Facility for Disaster Reduction and Recovery (GFDRR). (2021). Flood risk management in Dhaka. World Bank Group.
[25] Barua, S. (2008). Towards interactive urban flood management (Master's thesis). Erasmus University Rotterdam.
[26] Islam, N. (1998). Flood damage assessment for Dhaka (as cited in Mirza, M. M. Q.).

reported to be frequent, persistent, and severe (e.g., Anik, 2019[27]; Hasan, 2018[28]). In fact, Dhaka city suffers from extensive water logging during the monsoon (May to October) as a regular phenomenon due to fast and uncontrolled urbanization (Mawla and Islam 2013[29]). Since many structures are being built with low plinth level in recent years, are exposed to risk of flooding and waterlogging.

108. Dewan et al. (2007) suggested, infilling of natural channels and lowlands is the primary cause for increasing flood hazard in Greater Dhaka. Although Dhaka city used to have the natural drainage canals that would carry the floodwater to the rivers, due to the increasing population pressure, those canals have lost their ability to drain floodwater during the monsoon. Further addition is the illegal occupancy of the natural canals and drains systems.

109. The drivers of Dhaka's recurrent flooding are widely described as multi-causal, combining (i) seasonal monsoon rainfall and extreme precipitation, (ii) high river stages/backwater effects from surrounding river systems, and (iii) rapid land-use change and drainage congestion (Dewan, 2007; GFDRR, 2021). Following the catastrophic 1988 flood, large structural measures were implemented to reduce river flood exposure in parts of the city—most notably flood protection works in the more urbanized western areas—yet internal drainage congestion and localized inundation remain persistent challenges even in "protected" zones (Kamal, 2014[30]; GFDRR, 2021). For the BUTEX/Tejgaon setting, this citywide context is directly relevant because the broader Tejgaon–Hatirjheel–Begunbari system is sensitive to rainfall-runoff accumulation, canal encroachment, and constrained outfalls, which can translate into localized flooding and access disruption during heavy rainfall.

110. Analysis of the worldwide water occurrence dataset published by Peckel et al. (2016)[31] for the period of 1984-2015 suggest the eastern part of Dhaka metropolitan is more venerable to flooding and waterlogging than the western part, especially the banks of River Balu and River Turag, which confirms the annual flooding in this area (Figure IV-8). These parts include Uttara ABM city, Basundhara residential area, Khilgaon and Demra. On the western part, especially Mirpur, Pallabi and Cantonment area is vulnerable to waterlogging and flooding. While Mohammadpur, Bosila, Dhaka new Market area of the western part has lost many wetlands, in the eastern part, parts of Basundhara Residential area and Khilgaon has its wetlands. This can be ascertained to the rapid land development of the residential areas over last 2 decades or so. As seen in Figure IV-9 (right), most of the areas of Dhaka city east and parts of Dhaka city west, as mentioned earlier, goes under water for 1-2 months, indicating seasonal flooding or waterlogging.

[27] Anik, SSB. (2019) The never-ending woe of waterlogging in Dhaka, Dhaka Tribune, 13 July 2019, URL: https://www.dhakatribune.com/bangladesh/dhaka/2019/07/13/the-never-ending-woe-of-water-logging-in-dhaka Date Accessed: 11 May 2020.

[28] Hasan, J. (2018) Problem of waterlogging in Dhaka city persists: Residents suffer as investments hardly pay off, The Financial Express, July 18, 2018. URL: https://thefinancialexpress.com.bd/public/national/problem-of-waterlogging-in-dhaka-city-persists-1532750257, Date accessed: 11 May 2020.

[29] Mawla, QA, Islam MS. (2013) Natural Drainage System and Water Logging in Dhaka: Measures to address the Problems. Journal of Bangladesh Institute of Planners, Vol. 6, December 2013, pp. 23-33.

[30] Kamal, M. (2014). GIS based flood risk assessment: A case study on three wards in Dhaka City (Bangladesh Institute of Planners paper). Bangladesh Institute of Planners.

[31] Peckel, J., Cottam, N., Gorelick, N., and Belward, AS (2016) High-resolution mapping of global surface water and its long-term changes. Nature 540, 418-422 (2016) doi:10.1038/nature20584

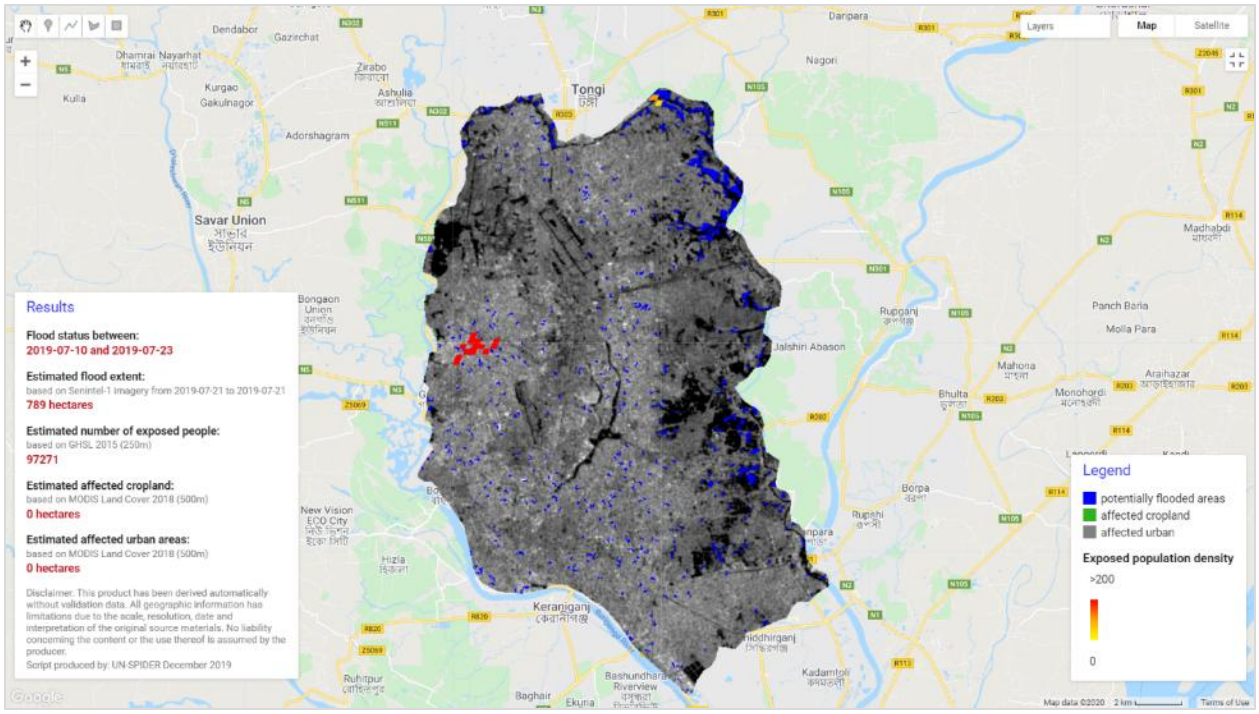


Figure IV-8 **Flood of 2019 in Dhaka city analyzed using Sentinel-1 SAR data in Google Earth Engine. The Red-yellow vertical gradient scale indicates the number of people exposed per 250x250m cell. Data credit: Peckel et al. (2016) and EC-JRC and CIESIN (2015).**

111. In addition to river flooding, waterlogging from inadequate internal drainage is a chronic monsoon-season issue in Dhaka and is repeatedly linked to fast, largely unplanned urbanization, narrowing/occupation of canals (khals), insufficient maintenance of drains, and encroachment on designated flood flow and retention areas (Mowla & Islam, 2013; Alam et al., 2023[32]). These conditions contribute to frequent and sometimes persistent street-level inundation after moderate to heavy rainfall, affecting traffic, access to services, and the functioning of built infrastructure (Mowla & Islam, 2013[33]; Alam et al., 2023). For the BUTEX EDC subproject, this baseline implies that site drainage continuity, plinth/floor level setting, and construction-phase stormwater control are critical risk-reduction considerations.

[32] Alam, R., Islam, M. S., & others. (2023). Dhaka city waterlogging hazards: Area identification and susceptibility assessment. Environmental Monitoring and Assessment, 195, Article 11106.
[33] Mowla, Q. A., & Islam, M. S. (2013). Natural drainage system and water logging in Dhaka: Measures to address the problems. Journal of Bangladesh Institute of Planners, 6, 23–33.

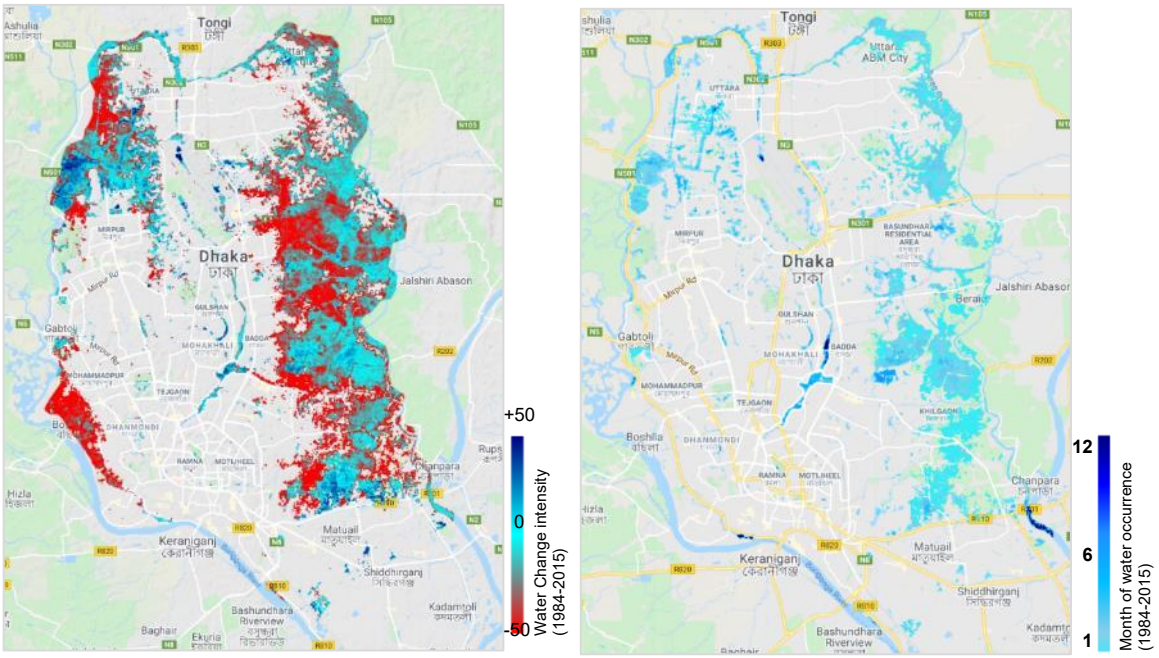


Figure IV-9 **Analysis of water change intensity (left) and monthly water occurrence (right) in Dhaka city. The figure at left shows extent waterbody has appeared and disappeared over the year of 1984-2015. The figure at right shows appearance of water over a certain period measured in month. The figures are produced using worldwide data set published by Peckel et al. (2016) coded in Google Earth Engine.**

7. Climate

a. Köppen Climate Classification

112. Under the Köppen-Geiger climate classification system, Dhaka is categorized as Aw (Tropical Wet and Dry Climate), also known as tropical savanna climate (World Bank Group, 2021[34]). This classification is characterized by:

- High mean annual temperature (>18°C for all months)
- Pronounced dry season during the winter months
- Wet season coinciding with the summer monsoon period
- Annual rainfall exceeding 1,000 mm with strong seasonal variation

113. The Aw classification distinguishes Dhaka from the **Am (Tropical Monsoon Climate)** found in southeastern coastal Bangladesh, where rainfall is more evenly distributed and

[34] World Bank Group. (2021). Climate change knowledge portal: Bangladesh country profile. https://climateknowledgeportal.worldbank.org/country/bangladesh

dry season intensity is reduced (World Bank Group, 2021). The Tejgaon meteorological station, located approximately 3 km from the project site, exhibits identical climatic characteristics to central Dhaka and serves as the representative climate monitoring station for the project area (Weather Atlas, 2024[35]).

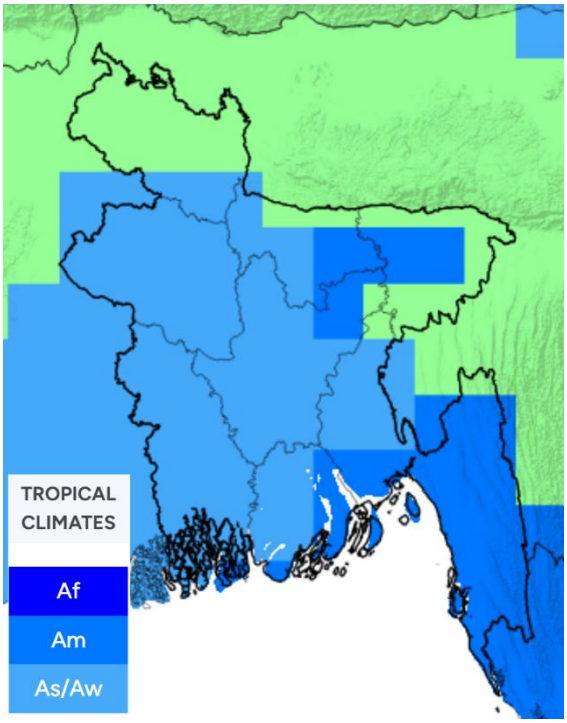


Figure IV-10 Köppen classification of climate system for Bangladesh. Project location fall under Aw. Source: WB-CCKP

b. Temperature Characteristics.

114. The 30-year average mean temperature for Dhaka is 25.7°C (World Bank Group, 2021), with monthly means varying between 18-19°C in January (coolest) and 29-29.5°C in May-June (warmest). This thermal regime places Dhaka firmly within the tropical classification, with no month averaging below 18°C. The annual temperature range (difference between warmest and coldest months) is approximately 11°C, indicating moderate seasonal temperature variation typical of low-latitude monsoon climates.

c. Climate Change Trends

115. Long-term temperature analysis indicates significant warming trends for Bangladesh. The Intergovernmental Panel on Climate Change (IPCC) reported that Bangladesh experienced an increasing trend in average temperature of approximately 1°C in May and 0.5°C in November between 1985-1998 (IPCC, cited in Alam et al., 2023). Projections indicate continued warming, with Bangladesh expected to experience an increase in average daily temperatures of 1.0°C by 2030 and 1.4°C by 2050 relative to baseline periods (Alam et al., 2023). Climate model projections (MPI-ESM-LR CMIP5) suggest future temperature increases of up to 5.3°C per century under high-emission scenarios, significantly exceeding the observed historical trend of 0.29°C per century (Alam et al., 2023[36]). These warming trends have direct implications for the EDC facility design, necessitating enhanced passive cooling strategies, increased HVAC capacity, and consideration of future climate conditions in building envelope specifications to ensure long-term performance and occupant comfort.

d. Rainfall

116. The 30-year average annual rainfall for Dhaka is 1,854 mm (Climate of Dhaka, 2010), though localized variations occur based on topography and urban heat island effects. The Tejgaon station records approximately 1,800-1,900 mm annually under normal conditions (Weather Atlas, 2024). Bangladesh's national mean precipitation ranges from 1,400 mm in the western region to 4,400 mm in the northeastern region, placing Dhaka in the moderate rainfall

[35] Weather Atlas. (2024). Yearly & monthly weather - Dhaka, Bangladesh. https://www.weather-atlas.com/en/bangladesh/dhaka-climate

[36] Alam, E., Ray-Bennett, N. S., & Kabir, R. (2023). Climate change in Bangladesh: Temperature and rainfall trends and their implications. PLOS ONE, 18(10), e0292668. https://doi.org/10.1371/journal.pone.0292668

zone (Alam et al., 2023). However, the extreme seasonal concentration of this rainfall creates significant hydrological management challenges.

117. Approximately 80% (1,483 mm) of annual rainfall occurs during the May-September monsoon period, with the remaining 20% distributed across eight months of dry and transitional seasons (Climate of Dhaka, 2010). This concentration is among the highest globally, creating distinct hydrological seasons with implications for construction scheduling, site drainage design, and stormwater management infrastructure sizing.

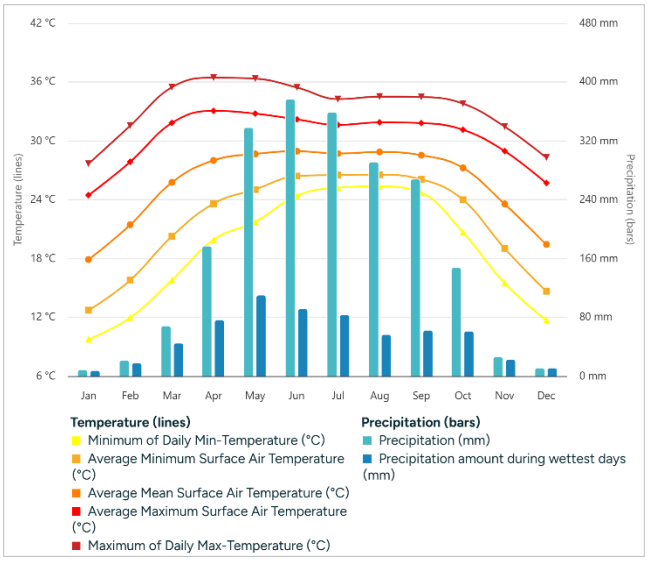


Figure IV-11 Observed seasonal cycle of Rainfall and temperature in Dhaka region. Source: WB-CCKP

118. The peak monsoon months of June-August contribute 1,068 mm (57.6% of annual total) across 45 rainy days, representing sustained precipitation with limited dry periods. June is the wettest single month at 377 mm (20.3% of annual rainfall), followed closely by July at 376 mm (Weather Atlas, 2024). Individual monsoon rainfall events can exceed 100 mm in 24 hours, causing widespread urban flooding in Dhaka's low-lying areas due to inadequate drainage capacity (Climate of Dhaka, 2010).

8. Environmental parameters

119. Baseline air quality in the vicinity of BUTEX reflects Dhaka's broader urban-industrial pollution profile, characterized by particulate matter (PM2.5 and PM10) concentrations that frequently exceed national ambient standards, particularly during the dry winter season (Centre for Policy Dialogue [CPD], 2023; Department of Environment [DoE], 2024). Long-term monitoring under the Department of Environment's Continuous Air Monitoring Stations (CAMS) network, which has recorded hourly SO2, NO2, NOx, CO, O3, PM2.5, and PM10 data across Dhaka since 2012, indicates that PM2.5 levels in the Dhaka Division regularly average in the range of 16-90 µg/m³ depending on season, with sharp seasonal contrast between the relatively cleaner monsoon period and the more polluted dry (winter) months when dispersion is limited (Department of Environment, 2026[37]; IQAir, 2025). Studies of Dhaka's air quality trends report an annual average Air Quality Index (AQI) that has historically placed the city among the most polluted major capitals globally, with seasonal AQI peaking in winter (around 229.7) and dropping substantially during the monsoon (around 92.8), driven largely by construction dust, vehicular emissions, brick-kiln activity, and high-sulfur diesel use in surrounding industrial zones such as Tejgaon (Author(s), 2024). Given BUTEX's location within the mixed industrial-institutional Tejgaon Industrial Area, background PM concentrations at the site are expected to be elevated relative to WHO guideline values and Bangladesh's revised 2022 Air Pollution Control Rules limits,

[37] Department of Environment, Bangladesh. (2026). CAMS-BD: Hourly air quality and meteorological measurements dataset (2012-2025).

reinforcing the need for construction-phase dust suppression and monitoring measures as prescribed elsewhere in this IEE (Department of Environment, 2022).

C. Biological environment

120. **Flora and fauna.** While the proposed EDC site itself is a barren, sand-filled plot without vegetation (Figure IV-13) and currently unused by teachers and students, the wider BUTEX campus retains scattered institutional greenery, including shade trees, lawns, and roadside plantings typical of Dhaka's university and campus settings. This limited green cover supports common urban-adapted bird species generally found across Dhaka's institutional and residential areas, such as house crows, common mynas, rock pigeons, and house sparrows, which are resilient to disturbance and habituated to human activity. Given the absence of forest patches, wetlands, or other sensitive habitats on campus, the wider BUTEX grounds are not expected to support any species of conservation concern, and construction of the EDC is unlikely to result in significant impacts on campus flora or avifauna beyond the two trees already identified for removal within the project footprint.

Figure IV-12 The proposed site has some trees present at the edge of the boundary wall.

Source: TA consultants

121. **Protected areas and reserve forests.** There is no protected area (PA) or reserved forest within 20 km of the project boundary. The nearest PA from the proposed subproject area is Bhawal Protected Forest, which is located roughly 25km from the project boundary (Figure IV-13).

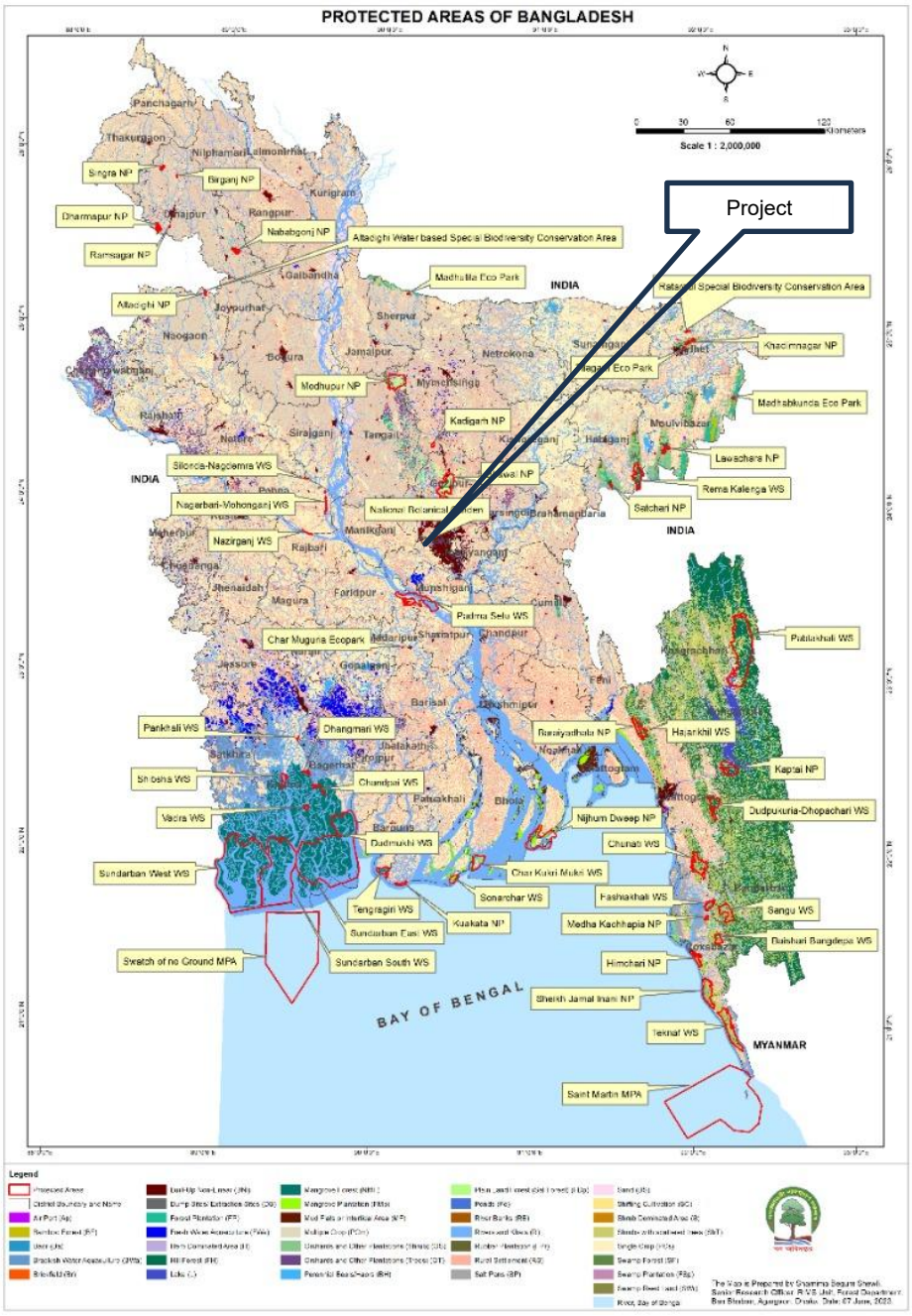


Figure IV-13 Protected areas of Bangladesh and location of the porposed project. The nearest PA is Bhawal national Park, located about 25km from the proposed site.

Source: Map collected from Forest Department website

D. Socio-Economic and cultural Environment

122. **Population and demography.** Dhaka is the most populated city in Bangladesh, and it is also one of the most populated cities in the world. According to Population and Housing Census, 2011 the city itself has a population estimated at about 8 million. According to a recent estimate of World Bank, total population of Dhaka City stands more than 20 million in 2019. Figure IV-14 shows an illustration of population growth in Dhaka City from 1960 to 2019. The total enrollment at the Bangladesh University of Textiles (BUTEX) is approximately 3,039 students, which includes around 2,943 undergraduate and 96 postgraduate students, alongside an annual intake of roughly 630 new first-year undergraduate admission seats. The Bangladesh University of Textiles (BUTEX) has approximately 149 academic staff (teachers) and 111 administrative staff, bringing the combined total to 260 personnel based on official institutional records.

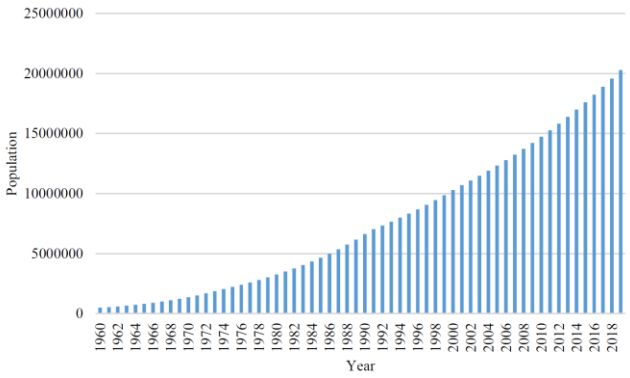


Figure IV-14 Population of Dhaka city.
Source: World Bank 2000

123. **Land Use.** According to a study conducted by Imran et al (2021) in 1993, the dominant land cover was lowland with 32.54%, followed by built-up area (26.07%), bare soil (16.95%), vegetation (15.99%) and water bodies (8.45%). Interestingly, the built-up area turned into the dominant land cover by reaching 35.74%, and lowland, bare soil, vegetation, and water bodies decreased to 28.9%, 16.39%, 12.28% and 6.69%, respectively in 2007. From 1993 to 2007, a significant increase (37.09%) in the built-up area was obtained and reached 35.74%. Vegetation, water bodies and lowland areas decreased by 23.21%, 20.77% and 11.2%, respectively, while the reduction of bare soil was negligible (0.24% per year). For the second time interval from 2007 to 2020, bare soil and built-up areas substantially increased by 118.72% (9.13% per year) and 22.12% (1.7% per year), respectively. Furthermore, lowland, vegetation and water bodies decreased by 73.04%, 46.1% and 8.82%, respectively. Finally, for the entire study period from 1993 to 2020, bare soil and the built-up area increased by 111.49% (8.58% per year) and 67.41% (5.19% per year), respectively. Lowland substantially decreased by 76.6% (5.85% per year) while vegetation and water bodies decreased at the rate of 4.51% per year (58.62%) and 2.14% per year (27.77%), respectively. Overall, the built-up area increased gradually during the study period while bare soil increased abruptly in the second stage of the study period (2007–2020).

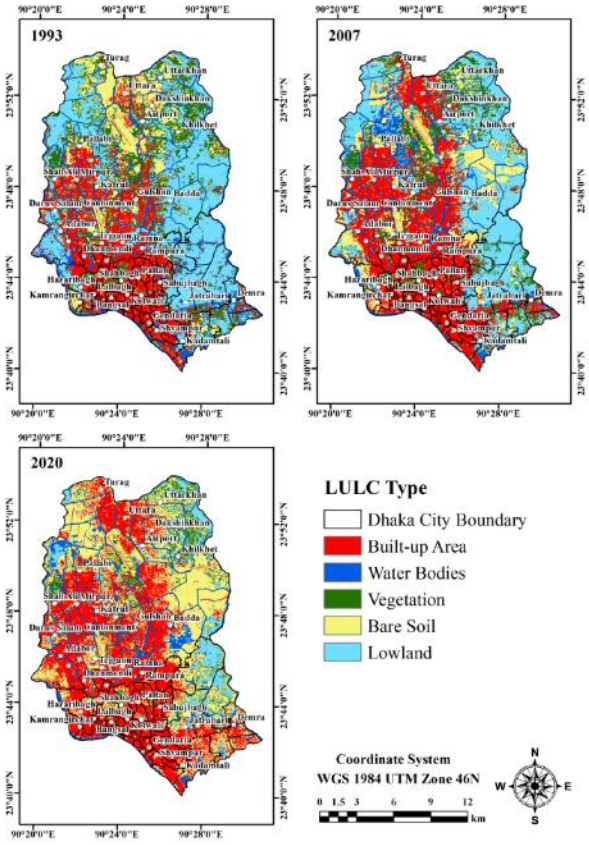


Figure IV-15 Land cover map of Dhaka City for the years (a) 1993, (b) 2007 and (c) 2020

Source: Imran et al. (2021) Impact of Land Cover Changes on Land Surface Temperature and Human Thermal Comfort in Dhaka City of Bangladesh. Earth Systems and Environment. https://doi.org/10.1007/s41748-021-00243-4

124. **Distance to sensitive receptor.** Within the 100 m radius, the nearest sensitive receptors include the existing BUTEX academic buildings and classrooms immediately adjacent to the project footprint, the campus student dormitory/residential halls, and internal pedestrian and vehicular circulation routes used daily by students and staff; construction-phase dust, noise, and traffic impacts are expected to be most acute for these receptors given their direct proximity. Within the wider 500 m radius, sensitive receptors include additional BUTEX academic and administrative buildings, nearby institutional facilities such as the Bangladesh Institute of Textile Technology or comparable polytechnic/technical institutes in the Tejgaon Industrial Area, mixed residential development fronting Shaheed Tajuddin Ahmed Avenue and adjoining side streets, and small-scale commercial/industrial establishments typical of the Tejgaon setting. No hospitals, healthcare facilities, or natural water bodies (rivers, lakes, or protected wetlands) are located within the 500 m radius; the nearest surface water/drainage feature of note is the Hatirjheel-Begunbari khal system, which lies at a greater distance but remains hydrologically connected to the site via the campus and municipal drainage network. This distance-based receptor mapping

will be incorporated into the baseline environment chapter, supported by a simple radius diagram overlaid on the site location map, to give reviewers and future EMP implementers a clear, quantified basis for targeting mitigation and monitoring effort toward the most proximate and sensitive receptors.

125. **Solid waste management.** Solid waste generated on the BUTEX campus is understood to follow the general municipal collection pattern applicable to institutions within Dhaka South City Corporation (DSCC) jurisdiction, where domestic, institutional, and commercial waste is typically collected at source by primary collection service providers (PCSPs) and transferred to nearby secondary collection points (SCPs) or secondary transfer stations (STSs), from which DSCC-managed compactors and containers transport the waste to the Matuail landfill site for final disposal. Within the campus itself, waste generation is expected to be dominated by general institutional refuse — paper, packaging, food waste from canteens, and classroom/laboratory waste — collected in bins placed around academic buildings and hostels, though no formal segregation system (e.g., separate organic/recyclable/hazardous streams), composting facility, or dedicated on-campus waste processing infrastructure has been documented for BUTEX to date. This baseline description is therefore based on the applicable city-level solid waste management framework rather than a site-specific audit of BUTEX's actual bin placement, collection frequency, segregation practices, or waste handover arrangements with DSCC or private contractors.

126. **Infrastructure, Transport and Communications.** Dhaka, being the largest urban agglomeration in Bangladesh, faces significant challenges related to infrastructure. The presence of adequate service infrastructure is crucial for a better quality of life. Unfortunately, Dhaka City Region (GDR) suffers from a severe infrastructure deficit. Dhaka is well connected by air, water, rail, and road networks to cities within the country and surrounding countries. However, the capacity of the modes of transport, particularly for passengers, is still low. The transport infrastructure of GDR is characterized generally by poor network planning, inadequate road capacity, poor road maintenance, and poor traffic management, undisciplined traffic management, overcrowding, slow movement, congestion, and frequent accidents (Islam 2005). Slow moving cycle rickshaws, along with fast-moving motorized vehicles mix freely in the city streets, which are often chaotic, and this creates congestion for unusually long periods (on average an hour for a short trip of about two kilometers). Apart from rickshaws, there are rickshaw vans and pushcarts and a few horse carts (in older Dhaka only), which ply regularly for business in the City. However, there are buses, CNG run three-wheeler “baby taxis”, minibuses, and private cars to accommodate the limited road spaces in the City. The road transport system in Dhaka is operated by formal (public and private transport) and informal transportation systems. The most obvious negative conditions concerning the transport sector include poor transport management, using the same routes by both motorized and nonmotorized traffic and lack of provisions for parking facilities in the City. The problem further intensifies by the poor management and coordination among responsible organizations. This situation severely constrains smooth functioning of traffic and costs very high for sustainable economic development and the quality of life (Nazem and Hossain 2019).

127. **Water supply[38].** The present water supply infrastructure shows that the underground water is raised to the surface through deep tube wells. There are 490 such deep tube wells in

[38] Nazem, NI. and Hossain, MA. (2021) Chapter 14: Strategic Infrastructure Supporting the Quality of Life in Dhaka. In: Multidimensional Approach to Quality-of-Life Issues – A Spatial analysis. Sinha BRK (ed). Springer. ISBN 978-981-13-6957-5 https://doi.org/10.1007/978-981-13-6958-2

operation. The overall length of water pipes in the City (DMA) is about 2600 km, providing water through more than 260,000 connections (Sheesh 2010). Of these, 92.7% of water goes for household use and the rest (6.54%) go to commercial and industrial uses. DWASA, however, supplies water to the low-income community almost free of charge, which is currently 0.68% of the total supply. It should be mentioned here that about one-third of the City population fall into the low-income category, receiving less than 1% of the water supply. Access to drinking water coverage to GDR reveals that 98% of households had access to safe drinking water in the region. However, the proportion of households with access by various sources of water varies by district. It has already been indicated that the Dhaka district has provided 66.4% of households with tap water. About 32% of households who live in the slums use tube wells. The proportion of tube well users is high among other districts in the region. At least 5% of households use water from sources other than taps and tube wells.

128. **Sanitation.** Dhaka megacity region (DMR) accounted for about 95% coverage. Sanitation conditions in GDR are better than the national urban scenario. About 86% of households in GDR have access to sanitary toilets. The sanitary conditions are worst in the slums and squatter areas of GDR. More than one-third of the population living in poor settlements and some poor households also enjoy sanitary toilets, meaning that conditions in Dhaka District are better than in the other districts of GDR. More than 93% of households have access to sanitary toilets in Dhaka.

129. **Traffic congestion.** The BUTEX campus is situated along Shaheed Tajuddin Ahmed Avenue in Tejgaon Industrial Area, a corridor characterized by dense mixed industrial, commercial, and institutional land use that generates persistently high traffic volumes throughout the day. City-wide traffic studies indicate that Dhaka experiences pervasive congestion lasting from roughly midday through evening (12:00 PM to 9:00 PM), with distinct peak periods and only modest relief on Fridays, reflecting the combined pressures of rapid urbanization, population growth, and constrained road infrastructure. Tejgaon-area roads are particularly prone to slow-moving traffic during peak commuting hours, a pattern that intensifies further when educational institutions are in full session, as increased student and staff movement compounds existing congestion from commercial and office traffic in the surrounding area. Given that the EDC site fronts an 18 m wide road on its southern boundary, which will also serve as the primary access corridor for construction vehicles, material delivery trucks, and equipment during the construction phase, any additional vehicle movements are likely to interact with this already congested baseline condition, particularly during peak entry/exit hours for students and staff. This baseline congestion underscores the need for a dedicated Traffic Management Plan (TMP), coordinated with Dhaka Metropolitan Police and local authorities, to schedule deliveries during off-peak windows and minimize additional disruption to campus and surrounding road users during construction

130. **Access to electricity.** The BUTEX campus falls within the service area of the Dhaka Electric Supply Company (DESCO), one of the two utilities distributing electricity within Dhaka city, alongside the Dhaka Power Distribution Company (DPDC). Official distribution performance data show that a typical DESCO-area consumer historically experienced an average of about 13.77 power interruptions per year (System Average Interruption Frequency Index), with a cumulative annual outage duration of roughly 367 minutes, or about 6 hours per year (System Average Interruption Duration Index) — a notably better reliability profile than the DPDC-covered areas of the city, which recorded more frequent interruptions. More recent reporting indicates that Dhaka's power supply situation has generally improved relative to the rest of the country: during the April-July 2026 heatwave-driven demand surge, urban Dhaka experienced comparatively

limited outages of around one to two hours per day, while DESCO and DPDC service areas were explicitly excluded from forecasted load-shedding, in contrast to Rural Electrification Board (REB)-served areas outside the capital, which faced far longer disruptions of six to eight hours or more daily. Bangladesh has also recorded stretches of zero load-shedding nationally when generation has matched demand, such as the week of April 27-May 3, 2026, underscoring that outages in the DESCO/Dhaka area are increasingly tied to occasional peak-demand or fuel-supply shortfalls (e.g., the Middle East-linked fuel disruption in April 2026) rather than chronic structural deficits as was more common in earlier years. Given this improved but still periodically strained reliability profile, the EDC design should retain backup power provisions (e.g., generator capacity, UPS for critical loads) sized to bridge short-duration outages of one to two hours, consistent with current Dhaka-area conditions rather than the longer four-to-six-hour outage patterns historically cited from older assessments (e.g., BRAC, 2012), which no longer reflect present-day DESCO service performance.

131. **Historic and archeological monuments.** he proposed EDC building within Bangladesh University of Textiles (BUTEX) campus (Tejgaon, Dhaka) will be implemented on an existing institutional site and is not expected to directly affect any designated historic or archaeological monument/structure within the project footprint. However, Dhaka contains multiple nationally significant cultural/heritage sites; therefore, the project will apply a chance-finds procedure during excavation and maintain standard controls on vibration, traffic routing, and construction nuisance to avoid indirect disturbance to nearby sensitive receptors. A list of notable cultural/heritage sites in the wider Dhaka metropolitan area near the BUTEX campus is provided in Table IV-1 below.

Table IV-1 Historical and archeological monuments and structures near to the BUTEX campus.

Sl. No.	Monument/structure of historical/cultural interest	Approx. distance from BUTEX campus (m)*
1	Jatiya Sangsad Bhaban	2,404
2	Bangladesh National Museum	2,627
3	Tejgaon Airport (BAF Base Bashar)	2,833
4	Bangladesh Air Force Museum	2,998
5	Liberation War Museum	3,708
6	Ahsan Manzil	6,112

Source: Compiled by the constant

V. ANALYSIS OF ALTERNATIVES

A. Need of analysis of alternatives

132. The primary objective of the "analysis of alternatives" is to identify the location/technology for a particular sub-project that would generate the least adverse impact and maximize the positive impacts. The preliminary assessment of the project included an analysis of alternatives, addressing the optimal match between required technical specifications and site conditions, as well as addressing any concerns for environmental, social, and economic features in each location.

B. Current proposal

133. The current proposed building is located behind the main building which will be known as the EDC Building of BUTEX. Proposal for space for the potential EDC BUTEX building at BUTEX campus has been already discussed in the earlier chapters. The proposed location is barren. A summary of the impacts of the current proposal is given in Table VI-1.

Table V-1 Summary of potential negative impacts of the current proposal

Sector	Negative Impact
Presence of important features within or around the land	Backyard of current BUTEX main building
Land (Government-owned land are to be given priority)	NO. The land is owned by BUTEX
Presence Agricultural/cropped land	None.
Village affected	None.
Families affected	None.
Loss of structures	None.
Impact on Common properties	None.
Trees to be chopped down	None
Presence of sensitive ecosystem	None.
Presence of waterbody	None.
Tribal population affected	None.

Source: TA consultants

C. The preferred alternative

134. Adopting "Without option" (option in which the actions considered in the Project are not implemented (business-as-usual option) and "Zero option" (option in which the project purpose is met by methods/businesses that are not subject to environmental impact assessment) will keep hampering the training process of teachers. Since the proposed subproject will have the minimum environmental and social impact but enhance the teaching condition and reduce waterlogging, better management of solid waste during construction though enforcing of Environmental Management Plan (EMP) implementation, and during operation stage by serving better transportation services, the subprojects are preferred for implementation.

VI. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION

A. Approach and methodology

135. The IEE commenced with the review of legal requirements for the project followed by collection of technical details, and discussions with SDCMU and DTE to reconfirm the data and information.

136. Scoping of issues to be addressed in the IEE was conducted early in the assessment process (i.e., field visit) to collect the appropriate baseline information. Additional tools and methods used are described in the following:

1. Approach

137. The IEE study has been conducted following the ADB SPS (2009), World Bank's Environmental and Social Framework (ESF) 2018, EIA Guidelines for Industries, prepared by the DoE in 2021[39] in accordance with the requirement of the Environment Conservation Rules (ECR 2023). The IEE process adopted in this study involves identification of the key impacts on natural and social environment and evaluation of the significant impacts along with recommendation of initiative measures as well as listing of unresolved environmental issues. The IEE includes collection of baseline information, setting of boundaries, impact assessment, suggestion of mitigation measures and alternative sites providing an environmental management plan.

138. This IEE study adopted a scoping of environmental assessment comprising of seven dimensions that explain the direction, magnitude, spatial extent, duration of impact, timing of impact, nature of impact and cumulativity of the possible impacts, if they are not mitigated. This was done to capture the complex environmental impact pathway of construction projects. The steps of impact analysis and their methods are described in the later sections (VI-A- 2 to VI-A-3). Results of Impact assessment and possible remedies are described in Section VI-B and onwards. Finally, the summary results of the final assessment ratings have been presented in the form of matrix in later sections.

2. Methods of physical environmental assessment

139. The issues of physical environment have been investigated through professional observation of the study team members backed up by feedback from the local people during field visits. The base of the physical environmental assessment was data from secondary sources and field observation in combination with google earth images. In general, the physical environmental data collection and survey was carried out by a composite method of investigation including observation, satellite image analysis and public consultation. Every analysis was done with world standardized tools and the result presented with Geographical Information System (GIS) interface. The geological and seismic issues have been taken care of through secondary information and field observations. The general geological features and the seismicity of the project and its surrounding areas were collected from available secondary literature and Geological Survey of Bangladesh.

[39] DoE (2021) EIA Guidelines for Industries, Department of Environment (DoE), Ministry of Environment, Forest and Climate Change, Government of the People's Republic of Bangladesh. Dhaka, February 2021.

140. Meteorological data such as rainfall, evapotranspiration, temperature, sunshine hours, humidity, wind speed and wind direction have been collected and analyzed for assessing local climate that are directly related to water resources of the study area and the project area. Meteorological data for selected stations have been collected from the Bangladesh Meteorological Department (BMD). The methods of physical assessment that has been implemented in this study is presented in later sections.

a. Primary data collection

141. Primary data sources include site visit impressions and interviews of relevant stakeholders such as local communities and polytechnic teachers. The information collected includes local topography, environmental condition, flooding condition, traffic situation, local hydrological information etc.

b. Secondary data collection

142. The secondary Information sources include published literatures, statistics, maps and reports collected from various government and non-government organizations, such as the Bangladesh Meteorological Department (BMD), Bangladesh Water Development Board (BWDB), Soil Resource Development Institute (SRDI), Geological Survey of Bangladesh (GSB) and the International Union for Conservation and Nature (IUCN), Bangladesh Bureau of Statistics (BBS) Population and Housing Census 2011, Community Reports of BBS. The information collected in such ways was categorized and added to the database of the baseline condition.

c. Socio-economic Survey

143. The social and economic data collection and review involved fact-finding from field, collection of data, tabulation of data, database entry, data compilation and review and the presentation of data. Secondary information including data, maps and reports has been collected from various sources. The data analyzed as part of this process has been collected from a number of secondary sources.

- **Primary data collection:** The socio-economic data especially for the social features of the Project affected area were collected through visual observation, focus group discussion and public consultations.
- **Secondary data collection:** Key secondary sources include Information on socio-economic profiles of the Project affected educational institutes which covers demographic profiles, education, coverage of heath and sanitation facilities, use of power, agricultural land etc.
- **Public Consultations:** Focused Group discussions (FGDs) and Key Informant Interviews (KIIs) were arranged at subproject site for public consultation. The stakeholders for the project were the teachers of BUTEX and students, since all the interventions will be implemented within the boundary of the BUTEX campus. In the consultations stakeholders were made aware of the project activities and consultants as well as consultants answered their queries, questions and took note of their suggestions. In addition, several informal group discussions as well one-on-one discussions were held with local people, project affected people and community representatives at the different locations of the Project sites. The team recorded their

perception of the proposed work and sought their suggestions on implementation of EMP with mitigation measures on how to reduce any potential impacts on natural and social environments and mainly centered on drainages congestion, flood, local landscape, removal of tress, loss of agricultural lands, and community cohesion problems.

d. GIS and Remote sensing

144. Geographical Information Systems (GIS) and Remote Sensing (RS) played crucial role in development and modelling of the spatial extension of environmental problems in the target city corporations such as extension of flooding, waterlogging, topography, population etc. Further, the GIS and RS technologies were used for investigations and detailed on-ground validation of spatial information on land use by using a hand-held, non-differential GPS in this IEE study. The Project alignment maps as Keyhole Markup Language zipped, Compressed Version of KML (KMZ) and Keyhole Markup Language zipped Google Earth (KML) produced during spatial modelling analysis were studied prior to field investigations, spatial analysis of satellite imagery was also used to identify land use boundaries. Based on spatial data acquisition and validated land use, the sensitive areas for sampling locations identified for biophysical survey of the Project. In addition, the GIS based maps of existing environment are produced for this IEE report from the collected information from field and acquisition of spatial data.

3. Impact assessment methodology

a. Impact categorization

145. **Significance of Impacts:** Generation of environmental and social impacts from infrastructure development is a function of the activities that take place during construction and operation of the infrastructure, on the one hand, and the particular environmental and social attributes of the local setting on the other. The people, communities and ecosystems that may be affected by a project (receptors) are variable in terms of their proximity to the infrastructure; their sensitivity to influences such as noise, disturbance and emissions; and their ability to adapt to change. The activities involved in construction and operation of infrastructure also vary based on the nature of the project, the noisiness and dirtiness of the construction works required, and how long different activities are carried out in one place. The significance of impacts depends on the particular juxtaposition of activities and receptors in specific locations.

146. **Typology of impacts:** The impacts that arise from particular configurations of infrastructure development activities and landscape features may emerge in different forms and through various pathways. It is useful to consider the types of impacts that may come into play - some of which may be more immediately obvious than others - when assessing the potential effects of a project on people and nature in the surrounding environment.

147. Table VI-1 below explains the Impact categorization and typology adopted for this study. Figure VI-1 explains the impact assessment process that has been adopted in this study.

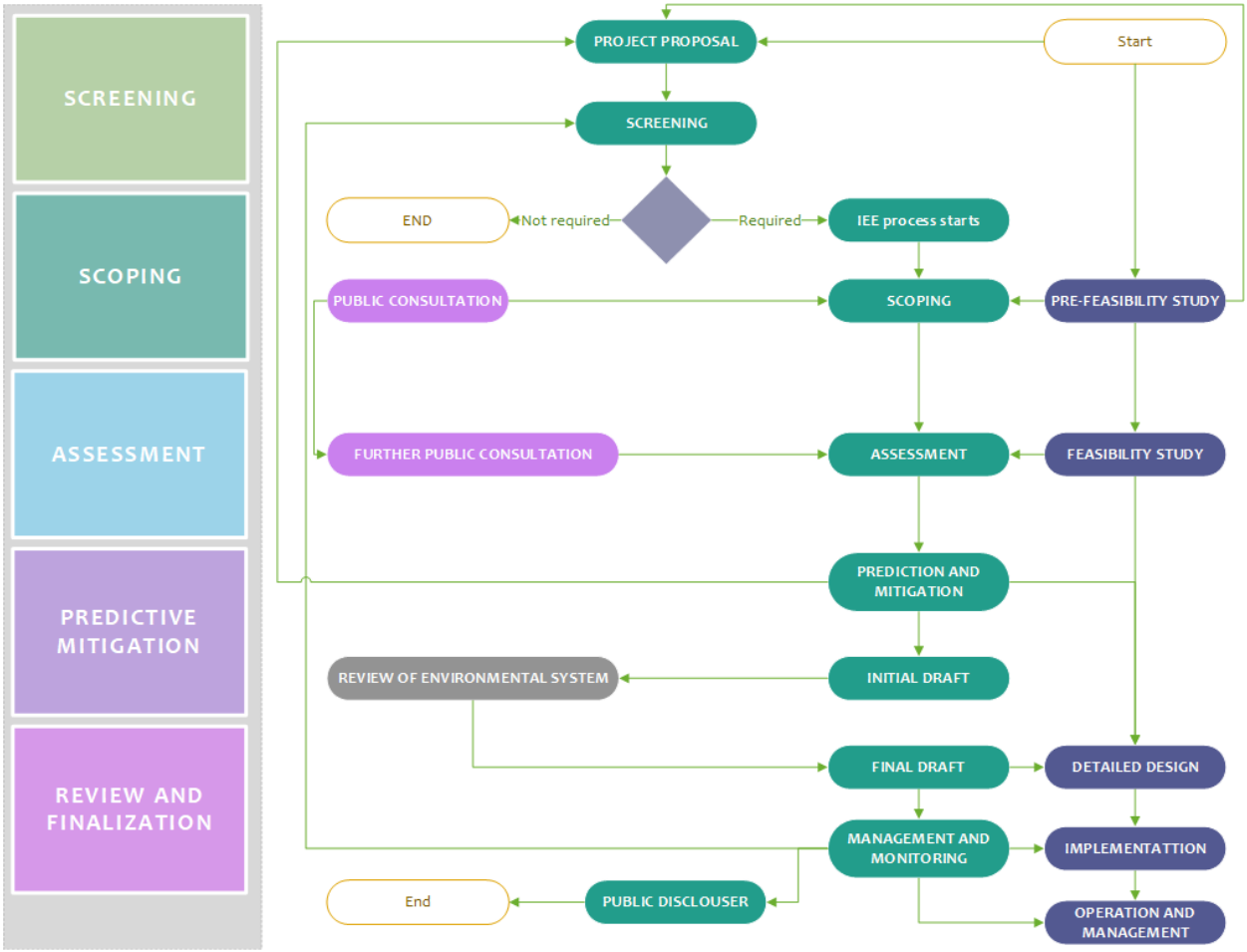


Figure VI-1 IEE process adopted for this study

Table VI-1 Impact categorization and typology adopted for this study

Impact parameter	Types of impact				Sign
Direction of change relative to baseline conditions	POSITIVE		NEGATIVE		+/-
Magnitude of impact in relation to ability of people and ecosystem to cope with change	NONE	MINOR	MAJOR	SEVERE	D/C/B/A
Spatial extent of effects	LOCALIZED		WIDESPREAD		Loc/Wid
Duration of effects experienced	TEMPORARY		PERSISTENT		Tem/Per
Timing of effects experienced	INTERMITTENT		CONTINUOUS		Int/Con
Nature of cause-and-effect linkage between project activity and impact experienced by receptors	DIRECT		INDIRECT		Dir/Ind
Relationship of project activities to impacts from other sources in landscape	ISOLATED		CUMULATIVE		Iso/Cum

b. Spatial Scope of Analysis

87. The area of influence of an infrastructure project is defined in the SPS 2009 (p. 31) as follows:

(i) The primary project site(s) and related facilities that the borrower/client (including its Contractors) develops or controls, such as power transmission corridors, pipelines, canals, tunnels, access roads, borrow pits and disposal areas, and construction camps;
(ii) Associated facilities that are not funded as part of the project (funding may be provided separately by the borrower/client or by third parties), and whose viability and existence depend exclusively on the project and whose goods or services are essential for successful operation of the project;
(iii) Areas and communities potentially affected by cumulative impacts from further planned development of the project, other sources of similar impacts in the geographical area, any existing project or condition, and other project-related developments that are realistically defined at the time the assessment is undertaken; and
(iv) Areas and communities potentially affected by impacts from unplanned but predictable developments caused by the project that may occur later or at a different location. The area of influence does not include potential impacts that might occur without the project or independently of the project.

148. The project activities at the BUTEX campus where physical works will take place; these include a full-fledged additional building including office, some accommodation and innovation laboratories, access roads and possibly a construction camp at site. It is expected that materials like sand and gravel will be purchased on the open market, rather than obtained from project-specific borrow pits or quarries.

149. With respect to cumulative impacts, the proposed development does need to be understood as a single piece of investment in urban structures only affecting the vicinity of the respective college.

150. The last category to consider as being part of the area of influence - areas and communities potentially affected by developments that can be expected to result from the development of the project - is certainly relevant. The proposed developments at the BUTEX campus are likely to facilitate and perhaps even be a significant driver of the local environmental development trajectory, especially in the field of water congestion and drainage. The infrastructure improvements can be expected to contribute to lessening the waterlogging and drainage congestion in the vicinity, thus less disrupting the local life, commerce and trade. The scale of induced development is difficult to forecast at the time of writing, but the general nature of the anticipated change in the local economy is nevertheless taken into consideration as part of impact analysis.

151. At the site level, defining the area of influence for the purposes of assessing impact potential is a subjective, context-dependent exercise. Noise and dust from construction activity, for example, are localized impacts likely to be experienced mostly within about 100 m of the construction site boundary.

c. Substantive Scope of Analysis

152. This IEE development considers the following parameters for scope of analysis:

(i) biodiversity, species of concern and critical habitat areas including forests, wetlands, and protected areas;
(ii) surface water bodies and groundwater;
(iii) air quality, including dust and emissions;
(iv) agriculture and fertile soils;
(v) tree cutting;
(vi) local acoustic environment;
(vii) drainage and waterlogging;
(viii) waste management (construction waste and operation phase waste);
(ix) climate change mitigation and adaptation;
(x) land use and livelihoods;
(xi) traffic congestion;
(xii) community life and interaction;
(xiii) private property and public utilities;
(xiv) public health and safety;
(xv) occupational health and safety, including as they relate to the COVID-19 pandemic unfolding during implementation of the Investment Project;
(xvi) physical cultural resources;
(xvii) possible transboundary impacts, including transmission of disease vectors, spread of invasive species, and harmful patterns of natural resource exploitation; and
(xviii) induced development effects and cumulative impacts.

153. The degree of emphasis placed on the key parameters identified here depends on their particular relevance, given the nature of the planned infrastructure and the characteristics of sites and receptors.

d. Temporal Scope of Analysis

154. Analysis of impacts and definition of suitable mitigation measures should be taken in all phases of the project infrastructure's development. Impacts may arise most obviously and visibly during construction, but the impacts of design and siting decisions made in the pre-construction phase, as well as the effects of intended and unintended activity at facility sites over the entire duration of the infrastructure's operating period, also need to be considered.

155. **Pre-construction phase (design impacts):** The design process offers considerable opportunities to reduce environmental impacts, through appropriate choice of materials, equipment and physical systems and features. For example, equipment and climate-control systems with the lowest associated greenhouse gas emissions (e.g., high-efficiency electric motors and lighting) shall be used during construction as much as possible so that the project inserts minimum of carbon footprint. A well-designed hydrological model set-up for 100 years may suggest the dimensions of the drainage passage to design. Incorporating such elements will help to maximize climate change mitigation as a feature of the project.

156. **Pre-construction phase (siting impacts)**: The selection of a facility site has the potential to generate environmental impacts based on:

(i) the physical characteristics of the site itself (e.g., topography, soils, drainage, exposure to natural hazards, past and present land uses);
(ii) the proximity of the site to impact receptors (e.g., water bodies, sensitive habitats, residences, schools, hospitals, public spaces);
(iii) the amount and type of work required to connect the facility to transport networks and service infrastructure; and
(iv) the distance between the facility and other facilities to which it is functionally linked.

157. **Pre-construction phase (procurement impacts):** Procurement decisions with negative impact potential during the construction and operation periods are related to both materials and service providers. Construction materials obtained from afar, especially those that are heavy and needed in very large quantities, can generally be expected to have a large carbon footprint due to increased emissions associated with their transport. Materials obtained from unsustainable sources contribute to environmental problems elsewhere. Use of construction and maintenance Contractors with a poor record of environmental and social safeguards compliance significantly increases the probability of all manner of negative impacts during the construction period, as well as the creation of problems whose effects will be felt far into the future. And hiring mainly or exclusively local workers accrues substantial project benefits to the local economy, while hiring workers from outside the project area may create social strife and requires establishment of construction camps, which typically have significant potential for negative environmental impacts.

158. **Construction phase impacts:** Impacts likely to arise during the construction phase relate to the physical activities that take place both at construction sites and at locations where related activity occurs, such as access roads, haul roads, and any borrow pits, quarries or spoil dumps established specifically to support construction of the site or sites in question. Although infrastructure construction is an inherently disruptive activity, many impacts of construction activity are well understood and amenable to minimization with appropriate construction site management.

159. **Operation phase impacts:** Impacts during use of infrastructure are generally of lesser magnitude and severity than construction impacts, and arise from regular operations and maintenance activity, but also from things that go wrong with these activities, such as accidents, fires, explosions and releases of harmful substances. Proper preparation and use of operations and maintenance manuals and protocols, as well as training of personnel and regular monitoring, are key means of preventing and minimizing operation phase impacts.

e. Impact Mitigation and Enhancement

160. **Objectives of mitigation:** The central goal of impact assessment is to determine how best to mitigate (make less serious, severe, or damaging) potential negative effects before they arise, and to identify opportunities for enhancing potential positive impacts, which may or may not be part of the project rationale. The IEE considers the specific activities that implementation will involve, from site selection through to operation, and defines the impacts that can be expected to arise in view of the particular features of the receiving environment. The analysis and discussion of impacts uses an integrated approach, in which environmental and social impacts are considered together in relation to each set of road development activities.

161. **Mitigation hierarchy:** Identification of an appropriate proactive approach for each expected impact in this IEE makes use of the standard mitigation hierarchy advocated by the ADB and other multilateral donors. In the mitigation hierarchy, top priority is given to measures that

enable outright prevention or avoidance of impacts. Where prevention or avoidance is not possible, the next most preferred option is to minimize impacts to the greatest extent possible, within reasonable limits of feasibility. Finally, and only once it has been confirmed that there is no feasible way to reduce an impact below a reasonable threshold of social acceptability, it will be appropriate to consider measures to compensate for the loss or damage caused to people and nature through reimbursement, replacement or some other means.

162. **Impact enhancement:** For positive impacts, there is no hierarchy as for mitigation, only one objective: to adopt measures to enhance or reinforce positive effects whenever possible, through thoughtful adaptation during site selection, design and implementation.

163. **Environmental Management Plan (EMP):** Measures will be prescribed for mitigation or enhancement of each predicted impact. Such prescriptions do not carry any weight unless they are made part of an obligatory implementation plan. The EMP translates the measures prescribed in this section of the IEE into costed action items assigned to specific actors and makes implementation of the action items subject to regular monitoring of compliance and effectiveness. The EMP is presented in Chapter 9 of this IEE report.

B. Findings of Impact Assessment: Pre-construction phase

1. Siting related impacts

164. Impacts related to siting of the infrastructure at the BUTEX are partly locked in by the established location of the already existing drains and roads owned by the institute, which will be redeveloped with some expansion (i.e., widening). Some location-related impact areas are discussed below.

a. Climate change, drainage and waterlogging

165. **Impacts:** For the BUTEX Executive Development Centre (EDC), siting-related environmental impacts are largely influenced by (i) the existing campus layout and access (internal circulation, service connections, and the southern frontage road), and (ii) the wider Tejgaon–Hatirjheel–Begunbari drainage setting, where rainfall-runoff can accumulate rapidly during monsoon storms and create short-duration inundation and access disruption. Because the EDC includes a basement and is located in a dense urban catchment, stormwater conveyance capacity and outfall reliability are key pre-construction risk considerations (Tawhid, 2004)[40].

166. Dhaka's climate risk is increasingly shaped by heavier rainfall episodes and short-duration, high-intensity storms, which can overwhelm local drainage and create waterlogging, even where annual rainfall totals may not show consistent increases (Climate Centre, 2024; Tawhid, 2004). This is particularly relevant in Tejgaon where drainage performance depends not only on rainfall intensity, but also on (i) the hydraulic condition of drains and khals, (ii) solid waste/sediment blockage, and (iii) downstream water levels and operational control structures associated with the broader urban drainage system (Tawhid, 2004; Hossain & Rafiq, 2016[41]).

[40] Tawhid, K. G. (2004). Causes and effects of water logging in Dhaka City, Bangladesh. TRITA-LWR Master Thesis (Royal Institute of Technology, Sweden).
[41] Hossain, M. A., & Rafiq, M. (2016). Hydraulic analysis of storm diversion system (SDS) of Hatirjheel–Begunbari Lake of Dhaka City. International Journal of Engineering Research & Technology, 5(1), 442–447.

167. In addition to monsoon convective storms, cyclone-peripheral rainfall can produce intense downpours over Dhaka and surrounding districts. For example, during Cyclone Remal (May 2024), official bulletins warned of heavy rainfall (44–88 mm) to very heavy rainfall (≥89 mm) in parts of Bangladesh under peripheral effects—levels that can exceed practical urban drainage carrying capacity when occurring over short time windows (Bangladesh Meteorological Department [BMD], 2024). While Remal's main impacts were coastal, the event illustrates the type of rainfall "shock" that can exacerbate urban waterlogging risk in Dhaka when drainage and outfalls are stressed (BMD, 2024).

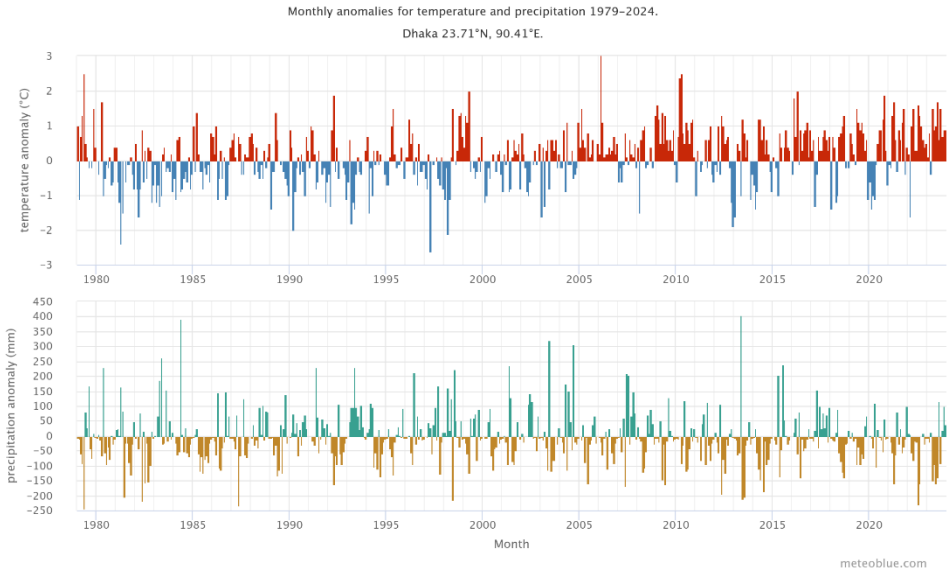


Figure VI-2 Temperature and precipitation anomalies (1979-2024 avg.) at Chattagram over the period of 1979 - 2023. data modeled by meteoblue.com.

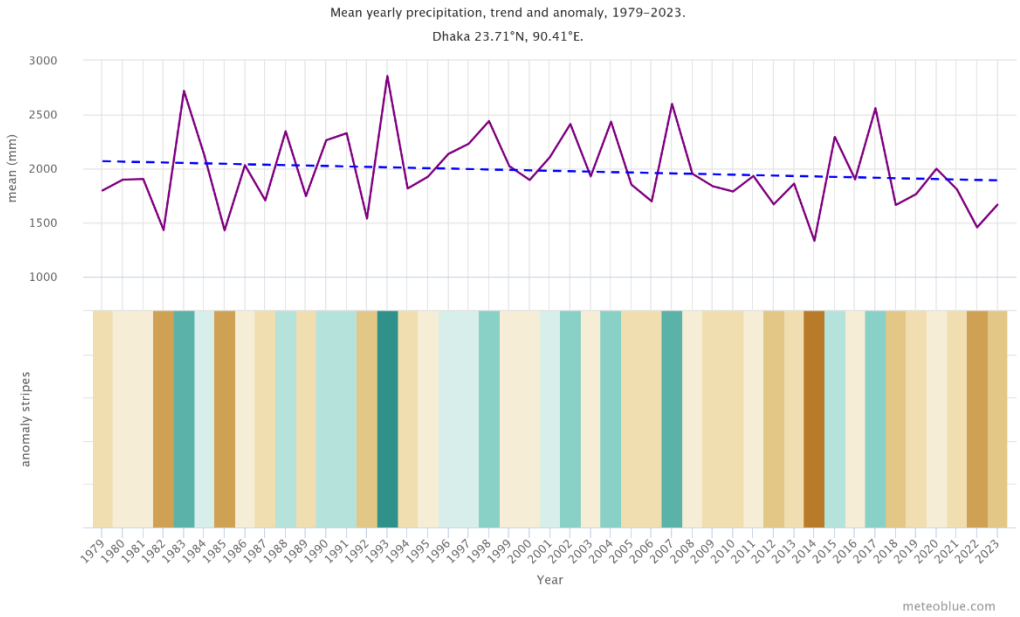


Figure VI-3 Yearly rainfall change (1979-2023 avg.) in Dhaka over the period of 1979 - 2023. data modeled by meteoblue.com

168. For the EDC subproject, siting does not create major quarry/borrow-pit related impacts because bulk construction materials are expected to be procured from the local market through licensed suppliers. The key siting-linked risk instead is local runoff concentration and water: basement excavation, temporary stockpiles, and altered micro-drainage pathways can increase ponding and sediment-laden discharge if temporary drainage is not carefully planned and maintained during early works (Tawhid, 2004). In the Tejgaon–Hatirjheel catchment context, this can also contribute to off-site drainage congestion if drains are blocked or if silt is washed into the storm diversion/pipe system (Hossain & Rafiq, 2016).

169. In many infrastructure development scenarios, the siting of quarries and borrow pits is a key determinant of GHG emissions from construction. In this case, bulk materials are likely to be purchased on the open market, so siting will not be an important consideration in this regard. The targeted construction site floods rarely after heavy rains, only when the catchment area overflows, since drainage systems are already installed. Yet, considering the climate change projections in Bangladesh predicting more and more intense rainfall over shorter period of time demands the drainage system to be enabled heavy overflow in shorter time. The projected intensifying rainfall over Bangladesh under climate change scenarios, specially under scenario 8.5 (Figure VI-4)[42], drainage system will play a crucial role in future development.

[42] Choi, YW., Campbell, D.J., Aldridge, J.C. et al. Near-term regional climate change over Bangladesh. Clim Dyn 57, 3055–3073 (2021). https://doi.org/10.1007/s00382-021-05856-z

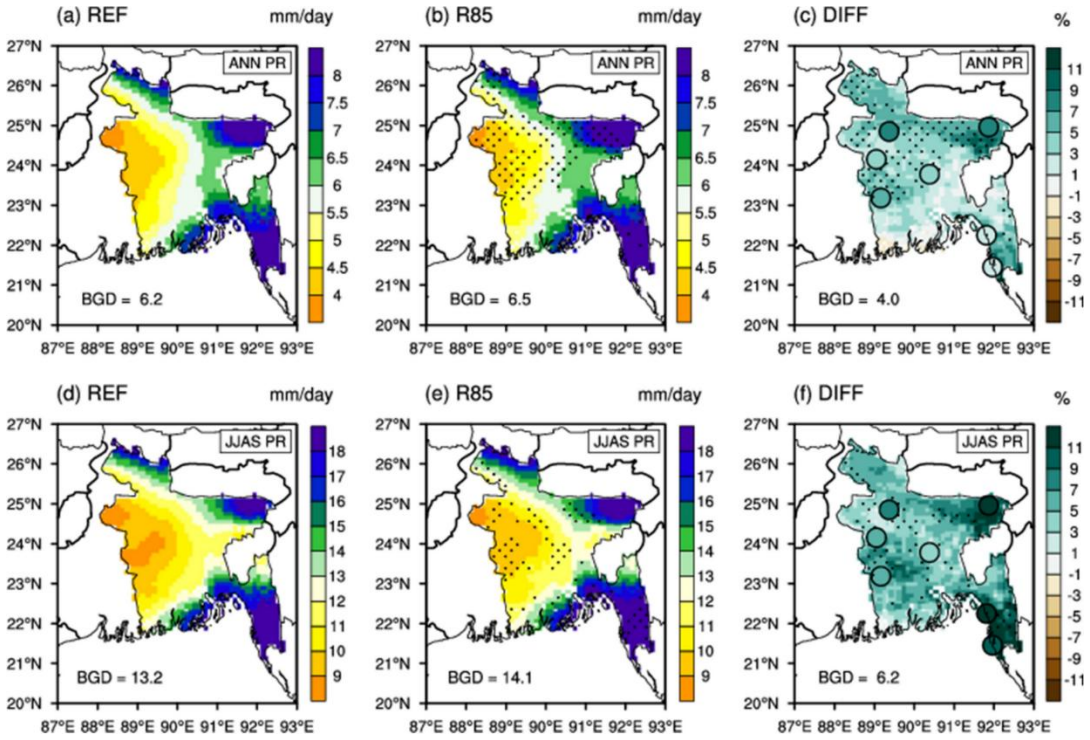


Figure VI-4 **Spatial distribution daily mean rainfall (PR; unit: mm/day) annually (a-c) and during the monsoon season (June to September; JJAS, d-f) using MRCM ensemble for the period of 2021-2050 under RCP 8.5 scenario. Area-averaged value over land is given on the bottom left corner of each plot (unit: mm/day). Source: reproduced from Choi et al., 2021**

170. **Mitigation:** The EDC design and pre-construction planning should adopt a conservative "design-for-intense-rainfall" approach, consistent with Dhaka's waterlogging history and climate risk context (Climate Centre, 2024[43]; Tawhid, 2004). Priority measures include:

(i) Confirm outfall connectivity and invert levels (campus drain → municipal drain/khals) before mobilization, including dry-season and wet-season functionality checks;
(ii) Set finished plinth levels and basement protection measures (ramp drainage, sump/pump capacity, backflow prevention) based on verified local levels and historical ponding points;
(iii) Prepare a temporary drainage and sediment control plan for excavation and early works (perimeter drains, silt traps, covered stockpiles, stabilized haul routes) to prevent drain clogging and off-site sedimentation; and
(iv) Include O&M responsibilities for keeping drains functional (routine desilting, debris screens, and emergency clearing during monsoon) as a binding requirement in contractor method statements (Tawhid, 2004).

[43] Climate Centre. (2024). Bangladesh: Country profile 2024 (Red Cross Red Crescent Climate Centre).

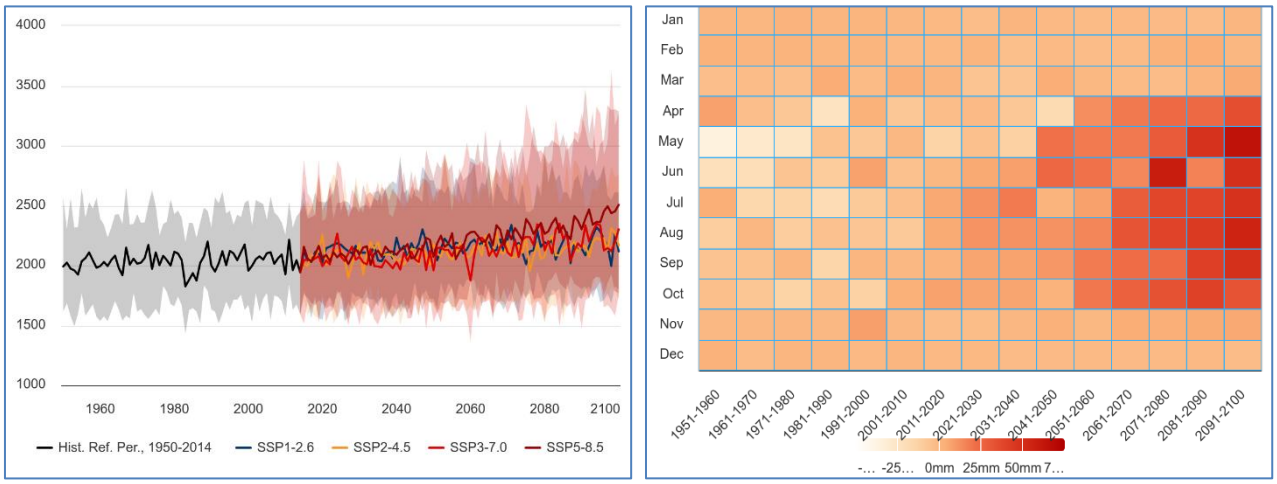


Figure VI-5 **Multimodel ensemble projected precipitation in Dhaka region under SSP 5 - 8.5 scenario. Although projected increase in precipitation is not quite high under SSP 5-8.5 by the year of 2050, the monthly distribution of precipitation project suggests, the window of high rainfall will be narrow, hence increasing the risk of flooding. Projection was taken from the World Bank's Climate Change Knowledge Portal (CCKP) available at:** https://climateknowledgeportal.worldbank.org/country/bangladesh/climate-data-projections

171. Climate mitigation and heat-risk considerations (siting/design interface). Managing energy efficiently is one of the most effective ways to reduce lifecycle greenhouse gas (GHG) emissions. For institutional buildings, on-site renewables (e.g., solar PV) and demand reduction through passive/efficient design are widely recognized mitigation pathways (IPCC, 2022). For the EDC, practical measures include:

(i) Rooftop solar PV where feasible (noting roof area constraints and maintenance access), aligned with the design intent indicated in the architectural drawings;
(ii) Heat-reduction roof strategies (high-reflectance/waterproofing systems and/or green roof components where feasible, with clear maintenance responsibilities);
(iii) Shade trees and landscape planning (including parking and pedestrian routes) to reduce heat stress and improve microclimate; and
(iv) Building envelope strategies that reduce cooling demand (solar control/shading, efficient glazing, and ventilation design appropriate to the final MEP concept) (IPCC, 2022; Climate Centre, 2024)..

172. The EDC should adopt a "green building" approach focused on measurable performance outcomes relevant to Dhaka—namely stormwater resilience, heat-risk reduction, and energy efficiency—rather than relying on aspirational claims. Design provisions already indicated in the architectural package (e.g., roof solar/garden intent, defined green/open space allocations, and façade shading/envelope elements) should be translated into enforceable specifications and EMP

commitments, including commissioning and O&M provisions, to ensure that climate and drainage benefits are realized in operation (IPCC, 2022; Climate Centre, 2024).

b. Flora and fauna

173. **Impacts.** As pointed out in the baseline section of this report, the proposed site within the BUTEX campus which is in inside the campus which are barren areas. Only six trees will be removed for the site preparation, which is unavoidable. Therefore, no significant impact is expected.

174. **Mitigation.** Although no significant impact is envisaged for the proposed construction of additional building, construction of green areas within the proposed building is suggested.

Figure VI-6 Green areas suggested at the EDC building site

Source: Detail Architectural Design

Enhancement. Tropical forests help cool the average global temperature by more than reducing carbon dioxide levels alone [44]. Tropical trees pull in and store 95% of all tree-based CO_2 sequestration on the planet[45]. However, a pair of recent studies show that rising temperatures are shortening the lives of trees in tropical forests and reducing their capacity to absorb carbon dioxide[2]. The BUTEX campus does not have plenty of space for afforestation. Afforestation with tropical trees can help in reducing CO_2.

2. Design related impacts

a. Climate change

175. **Impacts:** Development of the BUTEX Executive Development Centre (EDC) will unavoidably generate greenhouse gas (GHG) emissions during (i) construction (notably embodied emissions in cement/concrete, steel, glass, and transport) and (ii) operation (electricity for cooling/ventilation, lighting, lifts, lab loads, pumping, and standby generation). It is not yet credible to quantify total emissions in tCO_2e at this stage without a bill of quantities (BoQ), specifications, and the final MEP design; however, the IEE can still identify design choices that materially increase or reduce the project's carbon footprint. The buildings sector has substantial

[44] Forests help reduce global warming in more ways than one - Science News. https://www.sciencenews.org/article/forest-trees-reduce-global-warming-climate-cooling-carbon Accessed 4/11/2023.
[45] https://www.communitycarbontrees.org/climate-change-solutions Accessed 4/11/2022

mitigation potential through a combination of operational energy efficiency and embodied-carbon reduction in materials (IPCC, 2022[46]).

176. This is particularly relevant for Dhaka because grid electricity remains predominantly fossil-fuel based and backup diesel generation is common; therefore, design measures that reduce electricity demand and enable on-site renewables can reduce lifecycle emissions (SREDA, 2026[47]). Further, global evidence shows that materials-related (embodied) emissions—especially from cement and steel—remain a major source of building-sector emissions, so procurement and material specifications during design are critical levers (GlobalABC, 2023[48]; GlobalABC, 2025[49]).

177. **Mitigation:** Integrating GHG-mitigating design elements into the EDC provides a practical opportunity to improve performance relative to conventional public-sector construction practice. The recommended strategies in Table VI-2 should be incorporated into the preliminary design and reflected in bidding documents/specifications where feasible (IPCC, 2022; GlobalABC, 2025).

Table VI-2 Possible design phase measures for climate change mitigation

Climate change mitigation measure	Rationale
1. Substitute lower-carbon materials for high-volume concrete elements where feasible (non-structural components, finishes)	Cement/concrete is among the most emissions-intensive building materials; reducing high-carbon material demand lowers embodied emissions (GlobalABC, 2025).
2. Specify **lower-carbon concrete mixes** (where technically acceptable) such as cement replacement with SCMs and performance-based mix design	Reduces clinker content and embodied carbon while meeting strength/durability requirements (IPCC, 2022; GlobalABC, 2023).
3. Use materials available locally/regionally and optimize logistics	Reduces transport-related emissions and construction waste (IPCC, 2022).
4. Require **construction waste minimization** and reuse/recycling provisions in design/specs (standard sizes, modularity, segregation areas)	Materials efficiency and reduced waste lower embodied emissions and disposal impacts (IPCC, 2022).
5. Integrate **rooftop photovoltaic (PV)** into the electrical plan (space reservation, structural allowance, conduits, metering, maintenance access)	Offsets fossil-heavy grid electricity and reduces lifetime operational emissions (IPCC, 2022; SREDA, 2026).
6. Specify high-efficiency HVAC/ventilation strategy appropriate to use zones (classrooms, labs, halls), with commissioning requirements	Operational energy is a key emissions driver; efficient systems + commissioning reduce demand (IPCC, 2022).
7. Specify high-efficiency lighting (LED) with controls (daylighting sensors, occupancy sensors, zoning)	Reduces electricity demand for lighting and cooling interactions (IPCC, 2022).
8. Improve envelope performance: external shading, solar-control glazing, reduced west exposure, optimized window-to-wall ratio	Lowers cooling loads and peak electricity demand (IPCC, 2022).

[46] Intergovernmental Panel on Climate Change. (2022). Climate change 2022: Mitigation of climate change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (Chapter 9: Buildings). Cambridge University Press.
[47] Sustainable & Renewable Energy Development Authority. (2026). Electricity generation mix. Government of Bangladesh. https://ndre.sreda.gov.bd/index.php
[48] Global Alliance for Buildings and Construction. (2023). 2023 global status report for buildings and construction. UNEP. https://globalabc.org/sites/default/files/2024-11/global_status_report_buildings_construction_2023.pdf
[49] Global Alliance for Buildings and Construction. (2025). Global status report 2024/2025 for buildings and construction. UNEP. https://globalabc.org/sites/default/files/2025-03/Global-Status-Report-2024_2025.pdf

Climate change mitigation measure	Rationale
9. Maximize natural daylight (atria/light wells where safe/appropriate) without increasing heat gain	Reduces daytime lighting demand while maintaining comfort (IPCC, 2022).
10. Maximize natural ventilation opportunities where functionally feasible (non-lab areas) and avoid design features that block cross-flow	Reduces mechanical cooling needs in suitable spaces (IPCC, 2022).
11. Green/reflective roof strategy (cool roof and/or rooftop greening where PV space allows), with maintenance plan	Reduces heat gain and cooling demand; can also support stormwater management (IPCC, 2022).
12. Landscape plan prioritizing shade trees and heat-resilient native/perennial species	Reduces microclimate heat stress and avoids high irrigation/pumping needs (IPCC, 2022).
13. Water-efficient fixtures and leak detection	Reduces pumping/treatment energy and operational water demand (IPCC, 2022).
14. Rainwater harvesting/roof water management (if feasible) for non-potable uses	Reduces potable water demand and associated pumping/treatment energy (IPCC, 2022).
15. Efficient lifts/escalators (where applicable) with regenerative drives if feasible	Reduces operational electricity use (IPCC, 2022).
16. Efficient backup power strategy (right-sizing generator, load prioritization, low-emission generator options)	Reduces diesel use and emissions during outages/peak demand (IPCC, 2022).
17. Electrical distribution design to minimize losses (power factor correction, efficient transformers)	Cuts system losses and demand (IPCC, 2022).
18. Specify low-GWP refrigerants and refrigerant leak management plan in design	Refrigerant leakage can be a significant climate impact; design choices matter (IPCC, 2022).
19. Provide bicycle parking/active mobility support and traffic circulation that minimizes idling during entry/exit	Reduces indirect emissions and improves local air quality (IPCC, 2022).
20. Set measurable performance targets (EUI target, commissioning tests, metering plan)	Ensures “green” intent becomes verifiable operational performance (GlobalABC, 2023; IPCC, 2022).
21. Integrate lightning protection and surge resilience in the design	Reduces damage risk and avoids premature replacement (materials efficiency) (BNBC, 2020).

b. Public health and safety

178. **Impacts:** The BUTEX campus is located at 92 Shaheed Tajuddin Ahmed Avenue, Tejgaon Industrial Area, Dhaka, an area characterized by high traffic volumes and mixed industrial–institutional land use. During the pre-construction and construction periods, the EDC site will generate additional movements of trucks, concrete mixers, material delivery vehicles, and construction equipment, increasing the risk of (i) vehicle–pedestrian collisions, (ii) vehicle–vehicle conflicts at entry/exit points, and (iii) congestion and unsafe crossing behavior, particularly during peak class/office hours. These risks are heightened in dense urban settings where pedestrians, rickshaws, motorcycles, and heavy vehicles often share limited carriageway space. The EDC site frontage includes an 18 m wide road on the south side, which will likely be the principal construction access corridor and therefore requires strict traffic control arrangements (BUTEX Detailed Working Drawings, 2025).

179. From a public health perspective, campus buildings (classrooms, exam halls, libraries, multipurpose halls) can involve high occupancy and close contact. Recent experience from the

COVID-19 pandemic shows that crowded indoor environments can facilitate transmission of respiratory infections, and that ventilation and fresh air exchange are important risk-reduction measures for such settings (UK Health Security Agency, 2022[50]). Even if COVID-19 is not the primary concern at the time of operation, similar principles apply to future outbreaks of respiratory illness in high-density learning environments.

180. **Mitigation:** A Traffic Management Plan (TMP) shall be prepared by the Contractor (and integrated into the site-specific CEMP) and implemented under supervision of the Construction Supervision Consultant (CSC), with coordination as required with Dhaka Metropolitan Police (Traffic Division) and relevant city authorities. Key TMP and public-safety provisions for BUTEX EDC shall include:

- Dedicated, controlled access/egress points with trained flagmen, warning signage, lighting, and speed calming measures;
- Time-window scheduling for heavy vehicle deliveries (avoid peak student movement periods; avoid school/office peaks where possible);
- Physical segregation of pedestrians from construction traffic using continuous barriers/hoarding, marked walkways, and safe crossing points—especially along the southern frontage road (BUTEX Detailed Working Drawings, 2025);
- A strict on-site traffic circulation plan (one-way loops where feasible, marshalled reversing, spotters for blind zones, no idling policy at gates)

181. For operational public health resilience, the EDC design and O&M planning should incorporate adequate ventilation and indoor air quality management for high-occupancy spaces (e.g., exam halls, classrooms, multipurpose hall), supported by commissioning and maintenance protocols consistent with good practice for reducing respiratory infection risk in crowded indoor settings (UK Health Security Agency, 2022).

c. Waste management

182. **Impacts:** Increased commercial activities around the campus are likely to pose the risk of waste being dumped into the nearby drains. There is no drainage system at the proposed site. Natural low land works as the drainage system in the area. So, there will be a tendency to through waste at these lowlands. This waste stream will grow over time, and if this is not anticipated in monitoring design (the drains should be easily accessible for complete cleaning), waste management problems such as ad-hoc dumping and on-site burning are sure to arise.

183. **Mitigation:** Waste management problems can be avoided entirely by correctly anticipating future waste streams and incorporating adequate design features to collect, sort, and dispose of each class of waste. Adequate segregated collection bins should be strategically placed at indoor and outdoor locations of the campus structures where waste generation can be expected. The design of the drainage system also should include the access points where it can be cleaned. The experience from the entrance road reveals that drainage system should have some access points when extreme rainfall events occur, or waste dumping block the entire drainage system so that cleaning can be done when needed.

[50] UK Health Security Agency. (2022). Ventilation to reduce the spread, including COVID-19. https://www.gov.uk/guidance/ventilation-to-reduce-the-spread-of-respiratory-infections-including-covid-19

d. Site enhancement

184. **Impacts.** The proposed Executive Development Centre (EDC) will be developed within the existing BUTEX campus in a dense urban setting. The subproject includes a basement level, which increases sensitivity to stormwater intrusion, temporary ponding, and drainage backflow if site drainage and outfall connectivity are inadequate during heavy rainfall events. The architectural/site planning parameters indicate a compact institutional development with land area ~2,050 m², ground coverage ~1,015 m², and substantial open/green/paved areas (open space ~1,035 m²; green area ~510 m²; paved area ~510 m²), together with defined setbacks and a southern frontage to an 18 m wide road that will likely serve as the primary access and interface with external drainage/circulation. Accordingly, the main siting-related enhancement need is not "raising land" per se, but ensuring that (i) site grading directs runoff away from entrances/ramps, (ii) basement ramps and low points are protected, and (iii) drainage capacity and outfalls remain functional during intense monsoon rainfall.

185. **Enhancement.** Enhancement. The EDC provides an opportunity to implement a campus-integrated drainage and site-water management solution that strengthens resilience for both the new building and the surrounding BUTEX circulation areas. Key enhancement actions at design and pre-construction stage should include:

(i) Integrated stormwater network design linking roof drains, paved-area drains, and landscape runoff controls to verified outfalls, with clear hydraulic pathways and maintenance access;
(ii) Basement protection package (ramp trench drains, backflow prevention, sump pits with standby pumping capacity, emergency overflow routing);
(iii) Runoff reduction within the site by maximizing the performance of planned green area (~510 m²) and using permeable/controlled drainage detailing where feasible, consistent with the site allocation shown in the drawings;
(iv) Roof-level water management alignment with the intended solar panel/garden provision, ensuring waterproofing, overflow drainage, and maintenance responsibilities are clearly specified to avoid leakage and uncontrolled discharge.

186. These enhancements should be embedded into the EMP requirements (including routine desilting/cleaning, debris screens, and monsoon preparedness) so that drainage performance is sustained throughout construction and operation.

3. Procurement related impacts

a. Contractor selection

187. **Impacts:** The success or failure of environmental mitigation in infrastructure development hinges to a significant degree on the primary Contractor's sense of environmental responsibility and commitment to compliance with prescribed safeguards measures. If Contractors with a poor track record of compliance are hired, it is more likely that environmental impacts that can be easily prevented or minimized will become more serious than they reasonably should. It is expected that the investments at the EDC BUTEX building will be implemented through a contract, so the choice of primary Contractor is doubly critical.

188. Upon award of the contract, the Contractor will be required to prepare a detailed Contractor Environmental Management Plan (CEMP) to demonstrate how it will meet its obligations under the EMP in relation to the investment site at the EDC BUTEX. The plan will be reviewed and approved by the construction supervision consultant (CSC) and the safeguards oversight unit (SOU) within the PIU; this review process is a critical opportunity to ensure that the selected Contractor understands and is committed to full implementation of its safeguards' responsibilities. A sample outline of a CEMP is provided in Appendix 11.

189. **Mitigation:** Only Contractors with a demonstrated commitment to safeguards implementation - as can be confirmed by previous construction supervision consultants and monitoring reports from past projects - should be hired. Bidding documents should stress safeguards requirements, and the documentation provided by bidding firms should be carefully scrutinized, including by following up with references to recent works completed. All Contractors and sub-Contractors must be registered with the Ministry of Labor and Employment.

190. Contractor candidates should be required to provide details of the age and fuel efficiency of their equipment and vehicle fleets in bids, and this information should be scrutinized and weighed in the selection process as a means of helping to limit the greenhouse gas generation potential of the investments. Construction contracts should require the primary Contractor and all of its sub-Contractors to use only modern, fuel-efficient machinery, and the employer (most likely the PIU) should have the reserved right to require removal and replacement of machinery it deems unacceptable in this regard at any time during the construction phase.

b. Labour sourcing

191. **Impacts:** Procurement of labor has two main potential impacts, which can be either positive or negative, depending on where most workers come from. First, use of mostly or exclusively non-local labor means that a construction camp will be needed, and this has significant potential for environmental and social impacts, including water pollution of local surface waters with untreated sewage and grey water; social discord due to worker behavior off-site, cultural misunderstanding and resentment about jobs going to outsiders; spread of communicable diseases including sexually transmitted ones; and occupational health and safety risks due to contactor failure to provide decent facilities. Hiring all local workers, by contrast, may mean that the need for a construction camp is eliminated.

192. Second, hiring mostly non-local workers is a missed opportunity for the project to bring benefits to the local community. The people who live in nearby areas will bear the brunt of any negative impacts that arise during the construction and operation phases, and employment opportunities will go some way in compensating for inconveniences and discomforts experienced. When all the jobs go to workers from other regions, wages do not stay in the local community. It is not uncommon in Bangladesh for progress on project works to be frustrated by deliberate actions of local factions angered by the use of non-local labor.

193. **Mitigation and enhancement:** In order to minimize and prevent construction camp impacts and maximize the project's benefits to the local community, the primary Contractor and all of its sub-Contractors should be contractually required to hire mostly or exclusively local residents for construction jobs. This should be stipulated in the bidding documents and contracts.

c. Material sourcing

194. **Impacts:** Generally speaking, materials that come from afar - especially very heavy materials - will have more significant environmental impacts associated with them, because of the extra energy used in transport. Transport often accounts for the greatest proportion of GHG emissions embedded in earthworks. Materials sourced from suppliers who obtain their wares by illegal and unsustainable means, such as hill-cutting, coercive farmland mining or riverbed mining (all notable problems in Bangladesh) effectively expand the environmental footprint of the infrastructure that is built with them.

195. **Mitigation:** Contractors should be required to prioritize proximity in sourcing materials such as gravel, sand and cement, provided that proximate sources are also not illegally or unsustainably obtained. The supplier is required under national law to furnish a Certificate of No Objection from the District Commissioner or Local Upazila Nirbahi Officer (UNO); Contractors should be contractually prohibited from purchasing materials from any supplier who is unable to show such a certificate and should be required to secure copies of the certificate for inspection by the construction supervision consultant.

C. Findings of Impact Assessment: Construction phase

1. Biophysical impacts

a. Water quality

196. **Impacts:** For the BUTEX Executive Development Centre (EDC), the highest construction-phase water quality risks will occur during site clearing, excavation, and basement works, when exposed soils can be mobilized by rainfall and conveyed into on-site drains and downstream municipal drainage. Because the EDC includes one basement and substantial paved/working surfaces will be created during construction, uncontrolled runoff can carry sediment (TSS/turbidity), concrete residues (high pH), and construction debris into the campus drainage network and off-site receiving waters (BUTEX Detailed Working Drawings, 2025). Where outfalls ultimately connect to the broader Hatirjheel–Begunbari drainage/waterbody system, water quality is already recognized as stressed in parts of the system, making additional sediment/alkaline discharges particularly undesirable (Pasha et al., 2023).

197. Construction runoff risks persist throughout the construction period, with monsoon-season peaks when heavy rain can wash pollutants from material stockpiles, equipment parking/maintenance areas, temporary batching/mixing points, and unpaved haul routes. Key contamination pathways include (i) sediment-laden runoff, (ii) cement wash water and concrete curing residues that can elevate pH, and (iii) oil/fuel leaks from machinery. These risks are heightened in active campus environments because drains may be shared with other campus functions and pedestrian access routes.

198. **Mitigation:** Erosion, sedimentation, and alkaline runoff impacts can be largely prevented through standard, enforceable construction water pollution controls, implemented through the Contractor's Construction Environmental Management Plan (CEMP), consistent with ADB safeguard requirements on pollution prevention and control (Asian Development Bank [ADB], 2009). Minimum measures include:

- Erosion and sediment control before excavation begins: perimeter silt fencing, sediment traps/basins (as space allows), stabilized site entrances, and prompt covering of stockpiles.
- Dedicated concrete washout (lined, bermed, and signed) and a strict prohibition on washing cement/concrete residues into drains.
- Monsoon preparedness: temporary drainage channels around excavation, routine drain cleaning, and on-site housekeeping to prevent drain blockage by spoil and waste.
- Secondary containment for fuels/chemicals (bunded storage), plus drip trays under stationary equipment.

199. To protect existing drainage functionality, the Contractor shall (i) maintain temporary bypass/flow continuity where drains are crossed or modified, (ii) install debris screens at key discharge points during construction, and (iii) designate a responsible site officer for daily inspection—especially before/after rainfall. Where groundwater seepage is expected from basement excavation, pumped water (if any) shall be settled/treated prior to discharge.

200. Runoff treatment and spill readiness. Where space and site conditions require, runoff control may include settlement/filtration arrangements (e.g., settling tanks/ponds, filter bags, or modular sediment units) and oil–water separation for equipment areas. A site-specific Emergency Response Plan (spill response) shall be included in the CEMP, with spill kits, trained staff, and immediate containment procedures for fuel/oil/chemical incidents (ADB, 2009).

201. Monitoring framework and performance benchmarks. Monitoring will focus on parameters most relevant to construction runoff and campus drainage protection, including: turbidity/TSS, pH, oil & grease, and (where relevant) BOD/COD for wastewater from camp facilities. Discharges from the construction site shall comply with applicable limits under Bangladesh Environment Conservation Rules, 2023 (ECR 2023), including maintaining discharge pH within the allowable range and controlling suspended solids and oil/grease as per the relevant schedule/standards for discharge to inland surface water/drainage systems (ECR, 2023).

202. Monitoring locations should be practical and defensible: (i) a point inside the site before runoff enters campus/municipal drains (compliance point), and (ii) a point downstream (trend point) where feasible. Frequency should be increased during monsoon and during high-risk activities (excavation, concreting, dewatering if any). Results should be logged and reported in regular environmental monitoring reports to BUTEX/PIU/CSC.

203. **CEMP requirement.** An Emergency Response Plan (including spill response and incident notification) shall be a mandatory element of the Contractor's CEMP, aligned with ADB requirements for pollution prevention and good international practice (ADB, 2009). Appropriate contents of an Emergency Response Plan are listed on the sample outline of a CEMP provided in Appendix 9.

204. Construction camp wastewater control. If any on-site worker camp/toilets are established, the Contractor shall provide proper sanitation (e.g., septic tanks or approved temporary sanitation systems) sized for occupancy and maintained to prevent overflow and surface discharge. No untreated sewage shall be discharged to storm drains or surface water. These requirements shall form part of a Construction Camp Management Plan within the CEMP. A sample outline of a Construction Camp Management Plan is provided in Appendix 11.

205. Runoff from active construction sites should be of sufficient quality to prevent violation of minimum water quality standards in the receiving water body, as specified in the Environment Conservation Rules, 2023.

b. Air quality

206. **Impacts.** Construction of the BUTEX Executive Development Centre (EDC) is likely to affect local air quality primarily through dust (PM_{10}) and fine particulates ($PM_{2.5}$) generated from site clearing, excavation/basement works, material handling, concrete works, and on-site/approach-road traffic. These emissions will occur against a Dhaka background where particulate concentrations are already high and strongly seasonal, typically worsening in the dry winter months (Department of Environment [DoE], 2024; Centre for Policy Dialogue [CPD], 2023). Under Bangladesh's Air Pollution (Control) Rules, 2022, ambient air quality standards and associated regulatory expectations apply, meaning uncontrolled construction dust may lead to non-compliance risk and heightened scrutiny (Air Pollution (Control) Rules, 2022).

207. Key campus-relevant pathways include (i) re-suspension of dust from exposed soil, stockpiles, and unpaved haul routes; (ii) diesel exhaust from construction equipment and generators contributing to $PM_{2.5}$ and NO_x; (iii) secondary dust from truck movement and track-out onto surrounding roads; and (iv) fugitive dust from cutting/grinding and similar finishing activities. In a high-use academic environment, these impacts can reduce visibility, cause nuisance soiling, and aggravate respiratory symptoms among students, staff, and visitors—particularly during dry periods when dispersion is limited and baseline PM is elevated (DoE, 2024; CPD, 2023). The National Air Quality Management Plan (NAQMP) 2024–2030 specifically recognizes construction dust control as an important management area within broader air quality improvement actions (Ministry of Environment, Forest and Climate Change [MoEFCC], 2024[51]).

208. **Mitigation:** The Contractor shall implement an air-quality control program through the CEMP consistent with ADB safeguard expectations on pollution prevention and control (Asian Development Bank [ADB], 2009) and aligned with national requirements (Government of Bangladesh, 2022; MoEFCC, 2024). Minimum measures include:

- Site enclosure and access control: Continuous hoarding/fencing around the work zone; controlled gates; clear signage; and restriction of vehicle routes within campus.
- Dust suppression: Regular water spraying on exposed areas, excavation faces, and haul routes; frequency increased in dry/windy conditions and in winter months when PM is typically highest (DoE, 2024).
- Stockpile and materials management: Cover or wet down fine aggregates/soil stockpiles; minimize stockpile height; locate stockpiles away from sensitive receptors; keep cement and fine powders in covered/contained storage.
- Transport controls (track-out prevention): Require covered trucks for sand/soil/aggregates; provide wheel-washing or wheel-cleaning facilities at exits; promptly clean any tracked-out material from campus and adjacent roads.
- Equipment emissions management: Use well-maintained equipment; avoid unnecessary idling; prioritize grid electricity over diesel generators where feasible;

[51] Ministry of Environment, Forest and Climate Change. (2024). Bangladesh National Air Quality Management Plan (NAQMP) 2024–2030 [PDF].

ensure machinery meets applicable emissions-related requirements under the Air Pollution (Control) Rules, 2022 (Government of Bangladesh, 2022).

- High-dust activity controls: Use wet cutting where feasible; use vacuum extraction for grinding/cutting; schedule demolition/earthworks to avoid peak campus activity when practicable; stop/curtail dust-intensive work during high winds.
- No open burning: Strictly prohibit burning of any waste on site (Government of Bangladesh, 2022; MoEFCC, 2024).

209. **Compliance and monitoring.** Ambient air quality at the construction site boundary shall be managed to meet the standards set under the Air Pollution (Control) Rules, 2022, and emissions from motorized construction equipment should comply with relevant provisions of the same rules (Air Pollution (Control) Rules, 2022). Practical monitoring should include: (i) routine visual inspections (dust/no-smoke), (ii) documentation of watering/cleaning frequency, (iii) complaints log and response actions, and (iv) periodic PM monitoring (handheld or continuous, if required by the CSC/PIU or DoE), with intensified monitoring during earthworks and the dry season (DoE, 2024[52]).

c. Soil quality

210. **Impacts.** Construction of the BUTEX Executive Development Centre (EDC)—including basement excavation—can temporarily degrade on-site soil quality through several well-known pathways in dense urban settings. Exposed soils during clearing, excavation, and temporary stockpiling can be eroded by rainfall and wind, generating sediment-laden runoff that may clog campus/municipal drains and increase localized waterlogging risk during the monsoon. The use of heavy equipment, staging areas, and repeated vehicle movement can compact soils (including mixed urban fill and clayey units typical of Dhaka's terrace–floodplain context), reducing infiltration and root aeration and increasing surface runoff (Rahman et al., 2018[53]).

211. In addition, accidental releases of fuel, lubricants, hydraulic fluids, paint/solvent residues, and concrete wash water can create localized contamination "hotspots" near equipment yards, generators, refueling points, and mixing/washout areas. Concrete wash water is of particular concern because it can be highly alkaline and can alter soil chemistry if discharged to bare ground. Poorly planned temporary diversions or hardstandings can also reroute flows and concentrate velocities along edges/footpaths, leading to rutting and gully initiation. Finally, if topsoil (where present) is not salvaged and reinstated, post-construction landscaping (including planned green areas) may suffer from reduced organic matter and poorer soil structure.

212. **Mitigation.** The Contractor shall implement soil protection measures through the Construction Environmental Management Plan (CEMP) consistent with ADB requirements for pollution prevention and control (Asian Development Bank [ADB], 2009) and with national compliance obligations under Bangladesh's environmental regulatory framework (ECR, 2023). Measures shall include:

- Soil erosion and sediment control plan (SESC): Prepare a site-specific SESC plan (maps of disturbed areas, drainage pathways, and BMP locations). Phase clearing

[52] Department of Environment. (2024). Air quality monthly report – Dhaka [PDF]. https://doe.portal.gov.bd/sites/default/files/files/doe.portal.gov.bd/page/45367de7_b1bf_4c52_a9f0_b60c22fffaac/2024-09-22-03-22-f7c051dbca477252fff2676dc9176982.pdf

[53] Rahman, M. Z., Kamal, A. S. M. M., & Siddiqua, S. (2018). Near-surface shear wave velocity estimation and Vs30 mapping for Dhaka City, Bangladesh. Natural Hazards, 92(3), 1687–1715. https://doi.org/10.1007/s11069-018-3266-3

and grading to minimize the extent and duration of exposed soil, and stabilize disturbed areas as early as practicable (ADB, 2009).

- Perimeter and inlet protection: Install silt fences/fiber rolls/sediment traps at downslope boundaries and protect drain inlets with sediment control devices; inspect before/after rainfall and maintain continuously.
- Run-on/runoff segregation: Divert clean run-on around work areas using berms/temporary channels; route site runoff through sediment controls before discharge to campus/municipal drains.
- Topsoil management: Where topsoil exists, strip selectively, stockpile in low heaps, cover and protect with silt fencing, and reuse for reinstatement/landscaping and green area restoration.
- Compaction management: Define haul routes and equipment zones; use temporary hardstands (geotextile + aggregate) where needed; rip/subsoil compacted areas prior to topsoil replacement and planting.
- Spoil and fine material storage: Place spoils away from drains; cover stockpiles during rain; provide toe protection and runoff controls; avoid uncontrolled on-site crushing that generates excessive fines (where feasible).
- Concrete and wash-water controls: Provide lined, bermed concrete washout pits; prohibit discharge of cement wash water to soil or drains; manage residues through approved disposal routes.
- Fuel/chemical controls: Designate bunded refueling/maintenance areas; maintain spill kits and MSDS; train crews; implement immediate containment and removal procedures for contaminated soils (ADB, 2009).
- Housekeeping and dust control synergy: Keep working surfaces orderly, promptly remove loose soil from paved areas, and prevent track-out to campus roads to reduce both soil loss and dust generation.
- Verification and handover checks: Maintain inspection logs for BMPs and spills; confirm stabilization and soil reinstatement (including compaction relief where needed) prior to demobilization and handover.

d. Flora and fauna

213. **Impacts.** The effects of construction work on species of conservation concern - and on local wildlife and habitats in general - will be negligible, provided that the location is in within the campus setting and number of trees or vegetation cover is minimum. As described in the Alternative Analysis Section, only 2 trees will be chopped off to make way for the EDC BUTEX building.

214. **Mitigation.** No special mitigation is needed to address potential wildlife impacts. Green space consideration in the design (see project description part) shall be good enough for compensating tree cutting.

2. Socioeconomic impacts

a. Traffic Congestion

215. **Impacts.** Construction of the BUTEX Executive Development Centre (EDC) is likely to intensify local traffic congestion and circulation conflicts within and around the campus by increasing the frequency of material delivery trucks, concrete mixers, equipment movement, and worker transport, especially during peak entry/exit hours. The risk is amplified by the project's urban setting in Tejgaon Industrial Area and the fact that the site connects to an 18 m wide road on the south/front side, which is expected to serve as the primary access corridor for construction traffic. Temporary occupation of road space for unloading, gate queuing, and internal staging can reduce effective carriageway width, slow traffic, and create conflict points between heavy vehicles, pedestrians, motorcycles/rickshaws, and campus service vehicles. Unscheduled arrivals of haul vehicles can cause intermittent surges at access points, while ad-hoc parking of contractor vehicles can further constrain internal movement and impede emergency access. Without a site-specific, enforced transport arrangement, congestion and safety risks may extend beyond the immediate work zone and degrade mobility for students, staff, visitors, and adjacent road users.

216. **Mitigation.** A Traffic Management Plan (TMP) shall be prepared by the Contractor prior to mobilization as part of the CEMP and implemented under the supervision of the CSC/PIU, with coordination/clearance as required with Dhaka Metropolitan Police and local authorities. A sample TMP has been attached with this IEE as Appendix 4.

b. Noise and vibration

217. **Impacts.** Construction of the BUTEX Executive Development Centre (EDC) will increase noise and potentially ground-borne vibration due to excavation and basement works, concrete pouring, material handling, operation of generators/compressors, and increased truck movements. These impacts are important in a university setting because classrooms, offices, libraries, exam halls and other learning spaces function as sensitive receptors and may fall under the "silent zone" intent of Bangladesh's Noise Pollution (Control) Rules, 2006 for educational premises and their surrounding buffer (Noise Pollution (Control) Rules, 2006).

218. Typical sources include breakers/hammers, batching/compaction equipment, generators, and reversing alarms. If unmanaged, construction activities can cause (i) annoyance and speech interference during teaching, (ii) reduced concentration during examinations, and (iii) increased complaints. Vibration risks arise where activities such as heavy compaction, vibratory rollers, and (if any) piling transmit energy through the ground to nearby structures, potentially causing perceptible vibration and minor cosmetic impacts (e.g., cracking of plaster) even when structural damage thresholds are not reached. These risks increase if high-noise/high-vibration tasks overlap with peak academic hours and exams, or if plant is poorly maintained.

219. **Mitigation.** Construction shall be managed so that noise levels at sensitive receptors do not exceed applicable limits under the Noise Pollution (Control) Rules, 2006, and so that night-time disturbance is avoided unless specifically authorized. (Government of Bangladesh, 2006). To minimize both noise and vibration: (i) construction should be limited to daylight working hours as the default; (ii) all construction machinery and haul trucks must be maintained in good condition and fitted with effective mufflers/silencers; and (iii) equipment causing excessive vibration must not be used near sensitive structures without controls and monitoring.

220. **Specific mitigation measures.** The Contractor shall prepare and implement a Construction Noise and Vibration Management Plan (as part of the CEMP), including the following minimum measures:

- Planning and scheduling: Identify sensitive receptors (classrooms, exam halls, library, offices) and set work schedules so that high-noise tasks are conducted outside exam periods and peak lecture hours where practicable; prohibit night works unless formally permitted.
- Low-noise methods and equipment: Prefer quieter construction methods (e.g., bored/cast-in-place piling where piling is needed); select low-noise plant; fit generators/compressors with acoustic enclosures; use non-tonal or broadband reversing alarms where feasible.
- Site layout and barriers: Locate stationary noisy equipment away from teaching areas; install temporary acoustic barriers/hoarding and use site containers/stockpiles as noise screens where effective.
- Vibration control: Limit heavy compaction and vibratory rollers near existing structures; adopt a permit-to-work for high-vibration activities; use vibration monitoring (handheld or geophone where warranted) and adjust methods if trigger levels are approached.
- Traffic noise management: Control truck speeds, minimize idling, consolidate deliveries, and manage routes/gates to reduce conflicts near sensitive receptors.
- Building protection: Conduct pre-construction condition (dilapidation) surveys of adjacent buildings likely to be affected; define monitoring locations and response actions if vibration complaints occur.
- Communication and GRM linkage: Provide advance notice of noisy activities; maintain a complaint log and rapid corrective response; adjust schedules/methods based on monitoring results and stakeholder feedback.
- Monitoring and compliance: Establish baseline noise (and vibration where relevant); perform attended monitoring during critical activities; document exceedances and corrective actions for supervision and regulatory compliance.

c. Occupational health and safety

221. **Impacts.** Construction of the BUTEX Executive Development Centre (EDC) involves inherent occupational hazards typical of multi-storey building works, including falls from height, contact with moving machinery, struck-by incidents (flying/falling objects), cuts and burns, welding/arc flash exposure, electrical shock/electrocution, and risks related to excavation and basement works (e.g., collapse of trench/excavation walls, confined-space risks, and dewatering hazards). These risks can be elevated in a dense campus setting where construction interfaces with pedestrian movement and service traffic, increasing potential conflicts at access points and near work-zone boundaries (Asian Development Bank [ADB], 2009).

222. Workplaces can also function as transmission points for communicable diseases. Even where much construction is conducted outdoors, risk increases in enclosed or crowded settings (site offices, indoor fit-out stages, lifts/stairwells, shared transport, and worker accommodation). Lessons from the COVID-19 pandemic reinforce the need for basic infection prevention and

workplace hygiene as standard practice for large construction sites, especially during outbreaks of respiratory illness (World Health Organization [WHO], 2020).

223. Where worker camps or temporary accommodation are used, poor camp design and management can significantly increase health and safety risks. Common deficiencies include overcrowding, inadequate sanitation, poor ventilation, unsafe electrical wiring, lack of fire safety provisions, and insufficient access to safe drinking water. These conditions can contribute to gastrointestinal illness, heat stress, vector issues, and heightened communicable disease transmission (International Labour Organization [ILO][54], 2019; WHO, 2020[55]).

224. **Mitigation.** Mitigation. Occupational risks can be minimized through an enforceable Occupational Health and Safety (OHS) Plan within the Contractor's CEMP, supported by training, supervision, and PPE enforcement, consistent with ADB safeguard requirements (ADB, 2009[56]). Minimum measures include:

- Induction and task-specific training for all workers prior to starting work, refresher training at regular intervals, and re-induction for new crews.
- PPE provision and strict enforcement (helmets, safety boots, gloves, high-visibility vests, eye/face protection; fall arrest systems for height work; respirators where dust exposure is significant).
- Method statements and permits-to-work for high-risk activities (work at height, lifting operations, electrical works/LOTO, hot works, confined spaces, excavation).
- Safe access and egress (scaffolding standards, guardrails, toe boards, ladder safety, lighting, housekeeping).
- Excavation/basement safety (benching/shoring, safe slopes, edge protection, access ladders, daily inspection by a competent person, and emergency procedures).

225. **Communicable disease prevention.** The Contractor shall implement proportionate infection prevention measures as part of the OHS system, scaled to prevailing public health conditions and consistent with WHO guidance (WHO, 2020). Measures should include:

- access to handwashing facilities with soap/water and/or sanitizer;
- routine cleaning of shared surfaces and welfare facilities;
- health messaging and reporting mechanisms for symptomatic workers; and
- practical controls during outbreaks (spacing in canteens, ventilation in enclosed rooms, and isolation/referral protocols as required by local health guidance).

226. **Construction camp management.** If worker accommodation is provided on-site or off-site under the Contractor's control, a Construction Camp Management Plan shall be prepared and appended to the CEMP. The plan should specify, at minimum (ILO, 2019; ADB, 2009):

(i) adequate space and ventilation in dormitories (target minimum floor area per person and cross-ventilation);

[54] International Labour Organization. (2019). Safety and health in construction (ILO code of practice and guidance). https://www.ilo.org/global/publications/books/WCMS_106534/lang--en/index.htm

[55] World Health Organization. (2020). Considerations for public health and social measures in the workplace in the context of COVID-19. https://www.who.int/publications/i/item/considerations-for-public-health-and-social-measures-in-the-workplace-in-the-context-of-covid-19

[56] Asian Development Bank. (2009). Safeguard policy statement (June 2009). https://www.adb.org/sites/default/files/institutional-document/32056/safeguard-policy-statement-june2009.pdf

(ii) fire safety (multiple exits where applicable, alarms as appropriate, extinguishers in good working order, clear muster points);
(iii) separate eating and sleeping areas, with hygienic kitchens and safe food storage;
(iv) sanitation facilities sized to occupancy (adequate toilets with privacy, handwashing points, drainage);
(v) safe bathing/wash areas with drainage and gender-sensitive arrangements where relevant;
(vi) safe electrical wiring compliant with applicable national code requirements;
(vii) solid waste management (segregation, covered bins, regular collection); and
(viii) safe drinking water provided in sufficient quantity and maintained so it meets national standards (ECR, 2023).

d. Public health and safety

227. **Impacts.** Public safety risks during construction of the BUTEX Executive Development Centre (EDC) are primarily driven by proximity between the worksite and campus users/public road users. In a dense urban setting, there is increased likelihood that students, staff, visitors, and passers-by could come into contact with moving equipment, open excavations, lifting operations, or unstable stockpiles. Safety risks can also rise during periods of heavy hauling (delivery of aggregates, cement, steel and equipment), particularly near site access points and along the southern frontage road (18 m wide) that will likely serve as the main construction interface. Without robust controls, hazards may include slips/trips/falls, struck-by incidents, collision risks, and unauthorized entry into dangerous areas—especially during early excavation and basement works.

228. Public safety can also be affected by labor influx and worker–community interactions. If a sizable temporary worker population is housed near the campus or in nearby settlements, risks may include community tension, nuisance, and—importantly—gender-based safety concerns for women and girls. Such risks are typically associated with weak supervision, poor worker conduct controls, and lack of grievance pathways, rather than with construction itself. These issues are well recognized in international good practice on community health and safety and should be addressed through clear worker codes of conduct and community engagement measures (International Finance Corporation [IFC], 2009).

229. Public health impacts can arise from (i) prolonged high dust exposure (linked to respiratory irritation), (ii) sanitation failures associated with poorly managed worker accommodation (if any), and (iii) increased communicable disease risk where living conditions are overcrowded and hygiene is inadequate. These risks are preventable through basic environmental controls (dust suppression and waste management) and minimum welfare standards for workers (IFC, 2009; World Health Organization [WHO], 2020).

230. **Mitigation (site controls).** The Contractor shall implement public health and safety measures through the CEMP, consistent with ADB safeguard requirements for community health and safety (Asian Development Bank [ADB], 2009). Minimum controls include:

- Secure site boundary: continuous fencing/hoarding, lockable gates, warning signage (Bangla/English), lighting, and security guards where needed.

- Safe pedestrian access: protected, clearly marked walkways and crossings around the work zone; barriers separating pedestrians from traffic and plant movement; safe access maintained for ongoing campus operations.
- Excavation and lifting safety: guardrails and covers around excavations; controlled lifting zones with exclusion areas and trained banksmen; safe material stacking and berming of stockpiles.
- Traffic safety: low site speed limits, trained flagmen at entry/exit points, delivery scheduling to avoid peak campus hours, and strict no-idling/no-overtaking rules near pedestrian areas (ADB, 2009).

231. **Mitigation (workforce and camp-related measures).** The most effective way to reduce labor-influx risks is to minimize the need for worker camps, to the extent feasible, by prioritizing local hiring and/or daily commuting arrangements. If worker accommodation is necessary, the Contractor shall implement a Construction Camp Management Plan and Worker Code of Conduct, including:

- minimum accommodation, sanitation, water supply and waste management standards;
- mandatory induction on respectful behavior, harassment prevention, and rules for off-site conduct;
- clear disciplinary procedures for misconduct;
- proactive coordination with campus administration and local community representatives, including women's representatives where feasible; and
- an accessible grievance mechanism for community members and campus users (IFC, 2009; ADB, 2009).

232. **Mitigation (public health).** Dust-related public health impacts shall be mitigated through the air quality measures already specified (regular watering, covered stockpiles, covered trucks, track-out control, and housekeeping). Where camps exist, the Contractor shall provide routine hygiene promotion and health awareness consistent with WHO workplace guidance (WHO, 2020). These measures shall be integrated into the CEMP and monitored through routine inspections and incident/complaint tracking.

3. Waste management related impacts

a. Construction waste

233. **Impacts.** Construction of the BUTEX Executive Development Centre (EDC) will generate a range of solid wastes typical of multi-storey building works. These include: (i) excavated spoil from basement/foundation works, (ii) construction and demolition debris (concrete fragments, bricks/blocks, plaster), (iii) packaging waste (cement bags, plastic wrap, cardboard, pallets), (iv) scrap materials (steel off-cuts, timber/formwork remnants), and (v) domestic waste from workers. If not properly segregated, stored, and removed, such wastes can become windblown litter, clog drains, and increase downstream pollution—especially during monsoon rainfall when loose materials are easily mobilized. In addition, small but important streams of hazardous wastes may arise (e.g., waste oil, oily rags/filters, paint/solvent containers, chemical containers). Improper handling can cause localized soil/water contamination and create fire and occupational hazards. Bangladesh's regulatory framework emphasizes proper collection, segregation, transport and disposal of solid waste, and prohibits practices such as indiscriminate dumping and open burning.

234. **Mitigation.** The Contractor shall prepare and implement a site-specific Waste Management Plan as part of the CEMP, consistent with national requirements and good practice, covering (i) waste minimization, (ii) segregation, (iii) temporary storage, (iv) transport, and (v) final disposal through authorized routes. Minimum measures include:

- Segregation at source: Provide clearly labeled receptacles/skips for (a) inert construction debris, (b) recyclables (metal, cardboard, plastic), (c) domestic waste, and (d) hazardous waste (oily waste, chemical containers).
- Secure temporary storage: Keep waste in designated collection areas with covers/hoarding to prevent wind dispersal and rain contact; place storage away from drains and pedestrian corridors.
- Excavated spoil management: Stockpile spoil in controlled locations with toe protection and cover during rainfall; reuse suitable spoil for backfilling where feasible and remove surplus through approved transport/disposal routes.
- No open burning / no burial / no dumping: Explicitly prohibit burning, on-site burial, or dumping into drains/lowlands; include penalties for non-compliance in contractor procedures.
- Recycling and recovery: Arrange regular pickup of recyclables (especially scrap steel) through reputable recyclers; keep records of quantities and destinations as part of environmental reporting.
- Hazardous waste handling: Store waste oil and other hazardous wastes in sealed, labeled containers within bunded areas; transfer only to authorized/competent handlers; maintain spill kits and incident reporting. Requirements for managing potentially polluting waste should align with the broader environmental protection obligations under national rules.
- Housekeeping and drainage protection: Daily cleanup of loose debris, prompt removal of scattered packaging, and routine drain inspection/clearing to prevent clogging and secondary flooding risk during the monsoon.
- Documentation and supervision: The Waste Management Plan shall identify (by name) the intended recycling enterprises and disposal facilities/landfill operators and include a tracking/log system (collection dates, quantities, transporter, destination). The CSC/PIU will verify implementation through routine audits and corrective actions.

235. Appropriate contents of a Waste Management Plan are specified in the sample CEMP outline provided in Appendix 9.

D. Findings of Impact Assessment: Operation phase

1. Socioeconomic impacts

a. Risks of Gender-Based Violence and Sexual Exploitation, Abuse, and Harassment (GBV/SEA-SH)

236. **Impacts.** Construction and operation of the BUTEX EDC building carries inherent risk of gender-based violence and sexual exploitation, abuse, and harassment (GBV/SEA-SH), particularly given the influx of predominantly male construction workforces into an active university campus with a substantial resident and daily female student, faculty, and staff population. Risk pathways include unsupervised interaction between construction workers and students/staff at site boundaries, access points, and shared campus pathways; power asymmetries between construction personnel, supervisory staff, and vulnerable individuals; inadequate lighting, fencing,

or visual screening around the work zone and site perimeter; and the potential presence of temporary worker facilities or camps in proximity to student dormitories or unsupervised areas of the campus. National evidence indicates that GBV and sexual harassment remain significantly underreported in Bangladeshi tertiary institutions, with studies finding that as many as 90% of student survivors do not report incidents due to fear of stigma, distrust in institutional response mechanisms, or absence of functioning complaint committees, underscoring the importance of embedding robust, survivor-centered safeguards into this subproject from the outset rather than relying on generic assurances. These risks are heightened during the pre-construction and construction phases when workforce presence, site access, and campus circulation patterns change most significantly, but must also be considered during building operation given the EDC's mixed-use functions (dormitory-proximate access, exam halls, multipurpose hall, and library spaces used by students at varying hours).

237. **Mitigation.** Mitigation shall be embedded in the Contractor's CEMP and the project's broader safeguards framework, consistent with ADB SPS 2009 requirements and national guidance on preventing sexual harassment in educational institutions. Minimum measures include: (i) mandatory GBV/SEA-SH awareness training and a Code of Conduct for all construction workers, supervisors, and site personnel prior to mobilization, with signed acknowledgment and periodic refresher sessions; (ii) physical safeguards such as continuous site hoarding/fencing, controlled and monitored access points, adequate lighting along site perimeters and pedestrian routes, and clear separation of construction zones from student dormitories, classrooms, and common areas; (iii) establishment of a confidential, survivor-centered Grievance Redress Mechanism (GRM) specific to GBV/SEA-SH complaints, distinct from general construction grievances, with accessible reporting channels (e.g., complaint boxes, dedicated phone lines, and a designated focal point who is preferably female) and clear referral pathways to counseling, medical, and legal support services. Additionally, the project should require the Contractor to prohibit hiring of workers with documented histories of GBV/SEA-SH offenses, mandate a five-member complaints committee at the institutional level with majority female representation in line with national guidelines, prioritize local labor sourcing to reduce construction-camp-related risks, and ensure BUTEX's existing sexual harassment complaint committee (if operational) is briefed on and integrated with the project-specific GRM to ensure consistency and avoid parallel, confusing reporting structures for students and staff. These measures should be monitored throughout construction and reported regularly to the PIU safeguards focal person, with corrective action triggered immediately upon any substantiated complaint.

b. Waste management related impacts

238. **Impacts.** Operation of the new EDC building at Bangladesh University of Textiles will increase the generation, internal handling, and movement of solid wastes because of higher daily occupancy and intensified use of classrooms/training areas, meeting rooms, cafeteria/food service (if any), and administrative functions. In Dhaka’s constrained municipal collection context, inadequate segregation, storage, and collection can lead to littering, odor nuisance, pest attraction, leachate, and drain clogging, with heightened monsoon-season impacts when mismanaged waste blocks storm drains. These risks are directly relevant to institutional premises because the Solid Waste Management Rules, 2021 emphasize proper management practices and strengthen expectations for segregation and environmentally sound handling.

239. Without systematic source separation, mixed waste streams (organics, paper, plastics, glass, metals) reduce recovery value and increase downstream handling burdens. This is inconsistent with the 3R direction embedded in Bangladesh's solid waste policy framework and the growing emphasis on source segregation in urban systems.

240. EDC operation will generate hazardous waste in the form of e-waste from IT/office equipment, batteries, fluorescent/mercury-containing lamps, and printer cartridges, in addition to general institutional solid waste; these streams are classified as hazardous under the Hazardous Waste (E-waste) Management Rules, 2021, and must therefore be managed separately from general waste rather than co-mingled with it. If mixed with general waste, these materials pose occupational risks to cleaners and waste handlers — including exposure to heavy metals (lead, mercury, cadmium), battery electrolytes, and sharp/broken components — and would place the subproject in non-compliance with the formal collection, storage, transport, and disposal responsibilities established under the 2021 Rules. Seasonal peaks in campus activity (major events, training programs, exam periods, and conferences) can additionally cause episodic overflows of general waste if storage capacity and collection/pick-up frequencies are not designed to accommodate these peak loads, compounding the risk of hazardous items being improperly discarded alongside general refuse during high-activity periods.

241. Operation of the EDC laboratories poses environmental and occupational health risks primarily associated with the generation, handling, and disposal of hazardous chemical waste, distinct from the general construction and operational impacts already addressed elsewhere in the EMP. Without adequate segregation, storage, and treatment, spent dyes, solvents, and chemical reagents could contaminate surface water or groundwater if improperly discharged, or pose fire, inhalation, and dermal exposure risks to laboratory technicians and maintenance staff during handling and storage. Improper waste tracking may also result in illegal dumping or co-mingling of hazardous and non-hazardous streams, increasing off-site environmental contamination risk and complicating regulatory compliance under the Environment Conservation Rules 2023. Mitigation measures already embedded in the EMP—including engagement of a qualified laboratory design specialist to define waste segregation and containment features, mandatory use of designated hazardous waste storage areas with secondary containment, personal protective equipment and annual refresher training for laboratory personnel, an Emergency Response Plan integrated into laboratory operating protocols, and annual waste audits with quarterly effluent discharge monitoring—should be explicitly cross-referenced in this subsection to demonstrate that the identified risks are adequately addressed prior to and during operation

242. **Mitigation.** The EDC shall implement an operational Waste Management Plan (WMP) aligned with the campus system and Bangladesh's legal framework, including segregation, internal collection routes, storage, handover, and recordkeeping. Key measures include:

- At-source segregation (3R system): Implement wet/organic vs dry/recyclable vs residual separation at each floor and high-use areas, supported by color-coded bins and clear signage, consistent with national expectations under the Solid Waste Management Rules, 2021.
- Defined internal collection and storage: Establish routine collection frequencies by zone (daily for food/organics; scheduled pickups for dry recyclables), using covered trolleys/containers; provide a ventilated, washable waste room with a drain and water point (where feasible) to control odor and spills.

- Secure external storage and collection interface: Provide rodent-proof, lidded containers on a hardstand; ensure storage is away from storm drains and protected from rain to prevent leachate and windblown litter.
- Organics management: Reduce food waste through good kitchen/canteen practices; segregate food scraps for composting or approved organics handling where feasible; never mix organics with dry recyclables to avoid contamination.
- Recyclables recovery contracts: Contract reputable recyclers for paper/cardboard, plastics, and metals; track quantities and contamination rates monthly as performance indicators.
- E-waste and special streams: Establish separate collection points for batteries, lamps, toner/ink cartridges, and e-waste (IT and office equipment), store them securely and labeled, and transfer only through arrangements consistent with the Hazardous Waste (E-waste) Management Rules, 2021.
- Hygiene and pest control: Daily bin cleaning in food areas, spill response SOPs, and integrated pest management around storage points.
- Awareness and compliance: Regular orientation for staff/students/service providers; simple pictogram signage; periodic audits and feedback dashboards to improve compliance.
- No open burning / no illegal dumping: Explicitly prohibit open burning and uncontrolled disposal as part of campus operational rules, consistent with national policy direction.

E. Cumulative Impact Assessment

243. The Cumulative Environmental Impact Assessment (CEIA) for the proposed Executive Development Centre (EDC) at BUTEX considers the combined and interacting effects of (i) the EDC construction/operation, (ii) concurrent or pipeline campus development activities managed through BUTEX planning/procurement processes, and (iii) wider area-level urban infrastructure and redevelopment pressures in Tejgaon Industrial Area. Together, these can amplify pressures on mobility and access, ambient air/noise conditions, drainage and waterlogging risks, utility reliability, waste handling capacity, and overall campus user experience beyond the EDC's standalone effects. This cumulative framing is especially relevant because Tejgaon is undergoing rapid transition with intensified construction activity and land-use change, which can raise "background" levels of dust, noise, traffic disruptions, and service constraints.

244. At campus scale, BUTEX has an institutional planning and development function and publishes annual procurement planning information, indicating an ongoing pipeline of works and services that may overlap temporally with EDC phases. At city/area scale, major transport and urban-water systems that influence Tejgaon mobility and drainage performance—including the Dhaka Elevated Expressway corridor and the Hatirjheel–Begunbari Khal system—create additional cumulative interactions through construction staging, traffic diversions, and stormwater routing constraints.

245. **Impacts.** Key cumulative impact pathways and considerations:

(i) Traffic and access. Aggregated construction fleets (EDC plus nearby developments and periodic road/transport works) may increase queuing, variability in travel time, and pedestrian conflict risks at campus approaches—especially during concrete pours and peak delivery periods. Ongoing/remaining works and operational changes around major corridors can further compound congestion and diversions.

(ii) Noise and vibration. Multiple active sites in the surrounding area can elevate the background noise baseline; even compliant EDC activities may be perceived as intrusive during teaching/training and examination-like events.
(iii) Air quality and dust. Concurrent excavation, hauling, and high-rise construction activities in Tejgaon can add to cumulative particulate loading; without consistent dust controls, additive exposure may increase nuisance and health risks for campus users.
(iv) Stormwater and drainage. Simultaneous earthworks and temporary surface sealing across multiple sites can increase runoff volumes and sediment loads. This is especially important given Dhaka's reliance on linked drainage and detention systems; cumulative siltation/blockage can worsen localized waterlogging even where larger systems provide stormwater functions.
(v) Utilities and services. Overlapping construction-related demand spikes and utility tie-ins (power, water, sewer) across the area may increase short-duration disruptions or service instability during commissioning and peak construction activity (e.g., large pours, dewatering, lift operations).
(vi) Waste management capacity. Construction waste from multiple sites and increased operational waste from new/expanded facilities may strain campus storage and collection interfaces if standards and schedules are not harmonized across activities.
(vii) Campus amenity and green space. Prolonged staging, repeated pathway diversions, and additive disturbance can reduce campus walkability and comfort. If restoration is delayed, cumulative loss of shaded/quiet areas may affect user well-being.

246. **Mitigation measures.** Cumulative mitigation directions for the EDC within the campus/area context:

(i) Campus-level coordination mechanism. Establish a coordination arrangement led by BUTEX implementation/supervision functions to align EDC schedules with other campus works (including procurement-planned activities), covering delivery windows, internal circulation, safety interfaces, and utility shut-down planning.
(ii) Integrated traffic and scheduling controls. Apply a "no-overlap" matrix for peak-impact activities (bulk deliveries, concrete pours, major excavation activities) during sensitive campus time windows; coordinate with area-level traffic realities influenced by major corridor works/operations.
(iii) Shared environmental controls across sites. Standardize minimum requirements for dust suppression, track-out prevention, housekeeping, and sediment controls for any concurrent campus works; conduct joint inspections and rapid corrective action for hotspots affecting campus approaches.
(iv) Phased reinstatement and wayfinding. Commit to rapid, phased restoration of pedestrian routes and disturbed landscape areas after each construction stage; provide consistent signage, safe crossings, and communication updates to reduce cumulative exposure and confusion.
(v) Utilities and commissioning plan with redundancy. Sequence EDC commissioning with confirmed utility readiness; where feasible, maintain temporary redundancy (backup power, temporary water storage, staged tie-ins) during overlapping works to avoid cumulative service interruptions.

F. Summary of Impact Assessment

247. During construction of the BUTEX Executive Development Centre (EDC), the principal impacts are expected to include: (i) increased dust and particulate emissions from excavation, basement works, and material handling; (ii) intermittent noise and vibration from heavy equipment and concrete operations; (iii) temporary traffic congestion and access disruption near the site entry/exit due to delivery trucks and worker transport; (iv) localized soil erosion, compaction, and sediment-laden runoff that may affect drains and landscaped areas if exposed surfaces are not stabilized; and (v) increased construction waste requiring controlled storage, segregation, and off-site disposal through authorized routes. These effects can become more pronounced in an active campus environment unless works are phased and managed through good practice controls consistent with international guidance (e.g., World Bank/IFC EHS Guidelines) and Bangladesh's environmental management requirements. During operation, the EDC will increase occupancy and service demands, which may raise solid waste generation and utility loads; however, the facility can deliver net environmental benefits if "green operations" are embedded in management practices—such as waste segregation, efficient HVAC and lighting, water conservation, and low-impact cleaning—supported by routine monitoring and continuous improvement.

248. Mitigation follows a prevention-first approach supported by monitoring and adaptive management. For air quality and soil protection, key measures include phased clearing and grading, rapid stabilization of exposed areas, regular dust suppression, covering of stockpiles and vehicles, and strict track-out control (wheel washing/road cleaning). Sediment controls—such as silt fences, inlet protection, sediment traps, and stabilized drainage pathways—should be installed early and maintained throughout construction to prevent siltation of drains and off-site runoff impacts. For noise/vibration and traffic, high-noise tasks should be scheduled away from peak academic activities, quieter equipment and temporary acoustic barriers should be used where needed, and a site-specific Traffic Management Plan should regulate delivery windows, haul routes, marshaling/flagging, speed limits, and pedestrian protection to maintain safe and predictable campus circulation. For waste and hazardous materials, the Contractor should segregate wastes at source, store them securely on hardstand areas with weather protection, transfer them only through authorized handlers, and implement spill prevention/response procedures supported by training and clear SOPs.

249. Governance and performance assurance should be achieved through a concise but enforceable Environmental and Social Management Plan (ESMP) integrated with the Contractor's CEMP, with clear roles, responsibilities, and measurable indicators. Minimum requirements include baseline and periodic monitoring of dust (PM), noise, vibration (where applicable), and runoff quality; weekly "look-ahead" notices to campus stakeholders for disruptive activities; a functioning incident and grievance response system; and corrective actions tied to defined triggers (e.g., exceedance of agreed PM/noise levels, unsafe queuing, repeated complaints, or visible sediment discharge). Commissioning should confirm that environmental systems (drainage protection, ventilation provisions, waste storage areas, emergency arrangements) are functional and that O&M staff are trained, with documented as-built controls and operating procedures. Considering the nature, scale, and location of the EDC within an existing institutional campus—and assuming the above mitigation and management measures are implemented—the anticipated impacts are not expected to be of a magnitude or complexity requiring further specialized assessment. Accordingly, the subproject remains appropriately classified as Environmental Category B.

G. Summary Impact Matrix

Given the assessed level of impacts for the EDC BUTEX Building construction project discussed in the earlier sections, the following Tables give a summary assessment based on the method explained in Table VI-3.

Table VI-3 Summary Impact assessment matrix of EDC BUTEX building construction project

KEY: +/-: positive/negative impact; D/C/B/A: none/minor/major/severe; Loc/Wid: localized/widespread; Tem/Per: temporary/persistent; Int/con: intermittent/continuous; Dir/Ind: direct/indirect; Iso/Cum: isolated/cumulative. Please refer to Table VI-1 for detail methodology.

Item	Impact		Ratings (when not mitigated)												Discussions
			Construction phase						Operation phase						
			Magnitude	Spatial extent	Duration	Timing	Nature	Relationship	Magnitude	Spatial extent	Duration	Timing	Nature	Relationship	
Pollution	1	Air Quality	B-	Loc	Tem	Con	Dir	Cum	D	-	-	-	-	-	**Construction:** The dominant pathway is fugitive dust (PM_{10}/$PM_{2.5}$) from excavation and basement works, handling/stockpiling of sand and aggregates, loading/unloading, and vehicle movement on or near unpaved surfaces. In a campus setting, dust can quickly become a nuisance because it deposits on walkways, building façades, vegetation, and can infiltrate indoors. Diesel equipment and (if used) generators add NO_x/$PM_{2.5}$ and short-lived peaks occur during intensive delivery and concreting days. Cumulative designation reflects background urban construction and traffic; even modest site dust can feel "high" because baseline PM is already elevated in Dhaka. **Operation:** once construction ends, the EDC does not materially generate outdoor air pollution; the main air issues shift to indoor air quality management (filters, cleaning products, maintenance), which is handled under O&M rather than baseline ambient impacts.
	2	Water Quality	B-	Loc	Tem	Con	Dir	Cum	B-	Loc	Per	Int	Ind	Cum	**Construction:** Highest risk occurs during rainfall (especially monsoon) when exposed soils and stockpiles generate sediment-laden runoff to campus drains. Additional high-consequence risks include alkaline concrete wash water (high pH) and oil/fuel leaks near equipment, which can contaminate drains and receiving waters. If temporary toilets/camps are poorly managed, sanitary pollution can occur. The risk is localized but potentially cumulative because campus drains link to wider drainage systems; sediment and debris can also reduce drainage capacity and worsen waterlogging. **Operation:** the building increases activity and imperviousness, so pollutant "wash-off" (litter, hydrocarbons from vehicles, cleaning residues) can occur intermittently during storms unless housekeeping and drain maintenance are strong.
	3	Soil Quality	C-	Loc	Tem	Con	Dir	Iso	D	-	-	-	-	-	**Construction**: compaction, loss of topsoil, minor contamination hotspots near equipment/washout/storage. **Operation:** low risk, but localized issues possible near waste storage, landscaping chemical use, or leakage—manageable through SOPs.
	4	Noise and vibration	A-	Loc	Tem	Con	Dir	Cum	C-	Loc	Per	Con	Dir	Cum	**Construction:** Noise sources include excavation equipment, concrete pumps, generators, compressors, and truck movements; vibration sources include heavy compaction and any piling (if used). Impacts are major mainly because receptors are sensitive: training rooms/classrooms, offices, and pedestrian corridors. If unmitigated, noise can interfere with speech intelligibility and concentration, and vibration can create annoyance and occasional cosmetic building effects (even if not structural). Cumulative reflects the potential overlap with surrounding urban construction and traffic noise. **Operation:** normal operations generate lower noise; residual risks are intermittent from HVAC plant, backup generator testing (if any), maintenance works, and event-related traffic.
	5	Offensive odors	D	-	-	-	-	-	D	-	-	-	-	-	**Construction phase:** There is no specific negative impact anticipated as the construction of drainage will not likely generate odors. **Operation phase:** There is no occurrence of odor from domestic waste anticipated.

Item		Impact	Ratings (when not mitigated)												Discussions
			Construction phase						Operation phase						
			Magnitude	Spatial extent	Duration	Timing	Nature	Relationship	Magnitude	Spatial extent	Duration	Timing	Nature	Relationship	
	6	Waste	B-	Loc	Tem	Int	Dir	Iso	C-	Loc	Tem	Int	Ind	Cum	**Construction:** waste streams include spoil (from basement), concrete/brick debris, packaging, scrap steel, timber/formwork, and small hazardous wastes (waste oil, oily rags, chemical containers). Without segregation and secure staging, waste can become windblown litter, clog drains, create dust during handling, and lead to improper dumping. **Operation:** higher user density increases daily municipal waste (paper, plastics, organics), plus special wastes (batteries, lamps, toner, e-waste). Risks become persistent because they depend on routine systems (bins, internal transfer, storage, collection contracts). Cumulative reflects reliance on broader municipal/recycler capacity and potential contamination that reduces recycling value.
Natural Environment	7	Protected Area	D	-	-	-	-	-	D	-	-	-	-	-	There is no any protected area designated by Bangladesh's laws or international treaties and conventions around the subproject sites, so that no specific negative impact is anticipated.
	8	Cultural heritage	D	-	-	-	-	-	D	-	-	-	-	-	There is no cultural heritage within 5km of the proposed sites. So, impact is expected.
	9	Ecosystem	C-	Loc	Tem	Con	Dir	Iso	D	-	-	-	-	-	**Construction phase:** non anticipated. **Operation phase:** There is no specific negative impact anticipated.
	10	Surface hydrology	A-	Loc	Tem	Int	Dir	Iso	C-	Loc	Tem	Int	Ind	Cum	**Construction:** drainage impacts arise when sediment, debris, or temporary diversions reduce drain capacity; this can cause localized ponding and nuisance flooding during storms. Basement excavation can create low points sensitive to inflow if temporary drainage is poor. **Operation**: impervious surfaces and roof drainage can increase peak runoff unless outfalls, inlets, and any on-site controls are maintained; poor maintenance can lead to recurring waterlogging at interface areas (ramps, edges, entry points).
	11	Topography and Geology	C-	Loc	Tem	Con	Dir	Iso	D	-	-	-	-	-	**Construction phase:** None expected. **Operation phase:** Slope failures or landslides are not expected as the subprojects are planned in the flat area.
Social Environment	12	Land acquisition	D	-	-	-	-	-	D	-	-	-	-	-	Since the EDC BUTEX will be constructed within its own land no land acquisition is needed
	13	Disturbance to livelihoods	C-	Loc	Tem	Con	Dir	Iso	D	-	-	-	-	-	**Construction phase:** There are some subprojects which require relocation / setbacks of structures. Their profiles shall be identified in the detailed survey. **Operation phase:** No major impact is anticipated since no land acquisition or resettlement will likely occur.
	14	Disturbance to Ethnic Minority Groups and Indigenous People	D	-	-	-	-	-	D	-	-	-	-	-	There are no ethnic minorities and indigenous peoples living around the project sites, so that no specific negative impact is anticipated.
	15	Deterioration of Local Economy	C-	Loc	Tem	Con	Dir	Iso	D	Loc	Per	Con	Dir	Cum	**Construction phases:** None expected **Operation phase:** none expected.

Item	Impact		Ratings (when not mitigated)												Discussions
			Construction phase						Operation phase						
			Magnitude	Spatial extent	Duration	Timing	Nature	Relationship	Magnitude	Spatial extent	Duration	Timing	Nature	Relationship	
	16	Land Use and Utilization of Local Resources	C-	Loc	Tem	Con	Dir	Iso	D	Loc	Per	Con	Dir	Cum	**Construction phase:** During construction the local playground might be blocked for few months during piling operation. **Operation phase:** Once construction is done, playground will be open with much improved grass plantation (as per deign).
	17	Disturbance to Water Usage, Water Rights, etc.	D	-	-	-	-	-	D	-	-	-	-	-	**Construction phase:** No major impact is anticipated since the subproject does not affect water usage or water rights. **Operation phase:** No major impact is anticipated as the subprojects are nothing to do with water use.
	18	Disturbance to the Existing Social Infrastructure and Services	B-	Loc	Tem	Con	Dir	Iso	D	-	-	-	-	-	**Construction phase:** Traffic increase may occur mainly due to road blockages, but it remains temporary and insignificant. **Operation phase:** During operation, the EDC is not expected to generate a significant traffic volume.
	19	Traffic congestion	B-	Loc	Tem	Con	Dir	Iso	D	-	-	-	-	-	**Construction:** deliveries and worker transport can create queues at gates and conflicts with pedestrians and campus vehicles—particularly at the southern 18 m road frontage, which is the logical construction interface. Unscheduled arrivals and on-street unloading can reduce capacity and create crossing hazards. **Operation:** traffic increases are episodic (events/trainings) and manageable, but without parking/entry management they can still cause intermittent congestion.
	20	Misdistribution of Benefits and Losses	D	-	-	-	-	-	D	-	-	-	-	-	No specific impacts to the local communities are anticipated both in construction period and operation period.
	21	Local Conflicts of Interest	D	-	-	-	-	-	D	-	-	-	-	-	No specific impacts to the local communities are anticipated both in construction period and operation period.
	22	Cultural Heritage	D	-	-	-	-	-	D	-	-	-	-	-	**Construction phase:** The subprojects are planned at the existing sites away from heritage sites so that possibilities that the subprojects damage local archeological, historical, cultural, or religious heritage sites are not anticipated. **Operation period:** No major impact is anticipated as the projects are away from heritage sites.
	23	Landscape	D	-	-	-	-	-	D	-	-	-	-	-	Almost all subprojects are planned at the existing site so that no specific impact on the surrounding landscape is anticipated.
	24	Gender	B-	Loc	Tem	Con	Dir	Iso	D	-	-	-	-	-	**Construction phase:** Construction camps often seen as a potential disturbance to the local culture. This also affects local men and women, mostly when workers are hired from outside of the locality. Sometimes, uncontrolled workers can introduce local prostitution, conflicts with communities, etc. Since all these potential offenses to local community, especially to women can me manageable by enforcing strict regulation at workers camp, the impact is assessed as moderate. **Operation phase:** EDC will facilitate equal opportunity to male-female teachers to access highest level of training and modern equipment.
	25	Children's Rights	D	-	-	-	-	-	D	-	-	-	-	-	**Construction phase:** No specific impacts are anticipated both in construction period and operation period. **Operation phase:** None.

Item	Impact		Ratings (when not mitigated)												Discussions
			Construction phase						Operation phase						
			Magnitude	Spatial extent	Duration	Timing	Nature	Relationship	Magnitude	Spatial extent	Duration	Timing	Nature	Relationship	
	26	Infectious Diseases	B-	Loc	Tem	Int	Dir	Iso	D	-	-	-	-	-	**Construction phase:** Infectious diseases among construction workers may occur, although the subprojects are small-scale and construction works would take only a short time if proper prevention measures are not taken. **Operation phase:** No major impact is anticipated.
	27	Work Environment (Including Work Safety)	B-	Loc	Tem	Con	Dir	Iso	C-	Loc	Tem	Int	Ind	Iso	**Construction phase:** Occupational safety and health may not be well maintained, and accidents may occur through the construction work if 1) Contractors do not abide the law, and 2) no proper prevention measures are taken. **Operation phase:** Accidents may occur during maintenance work.
Other	28	Accidents	B-	Loc	Tem	int	Dir	Iso	C-	Loc	Tem	Int	Ind	Iso	**Construction phase:** Accidents may occur due to the construction work, and traffic accidents may occur due to the increase of traffic volume. **Operation phase:** Accidents can occur and increase during maintenance work.
	29	Cross-boundary Impact and Climate Change	D	-	-	-	-	-	D	-	-	-	-	-	Deterioration of traffic congestion will increase CO_2 emission. However, no major impacts are anticipated as subprojects remain small-scale

VII. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

A. Rationale and Requirements for Disclosure and Consultation

250. Meaningful consultation and timely disclosure are essential to ensure that the interests and concerns of people and institutions that may be affected by the proposed Executive Development Centre (EDC) at Bangladesh University of Textiles (BUTEX) are considered from the earliest feasible stage. Early engagement helps (i) improve project design by incorporating stakeholder knowledge (e.g., campus circulation patterns, sensitive teaching/training periods, drainage "hotspots" during monsoon), (ii) reduce avoidable impacts through prevention-first planning, and (iii) minimize the risk of grievances, conflict, and reputational harm associated with public-sector investments.

251. The ADB Safeguard Policy Statement (SPS), 2009 requires meaningful consultation and information disclosure throughout the project cycle, in a manner commensurate with the significance of impacts and the project's environmental category. Consultations must be accessible, inclusive, and documented, and should allow stakeholders to provide input on design, construction scheduling, and management measures (e.g., dust control, traffic management, noise control, waste handling, and occupational/community health and safety).

252. **Disclosure.** In line with SPS 2009, project information should be made publicly available at key stages (project preparation, implementation, and updates). At minimum, disclosure should include the project rationale and scope, location and footprint within the campus, expected construction schedule, key risks and mitigation measures, and the project's grievance mechanism. For Category B projects, the IEE is normally disclosed on ADB's website, and a locally accessible version (or a non-technical summary in Bangla, where appropriate) should be made available at the campus (e.g., noticeboards and/or website).

253. **Consultation.** SPS 2009 expects consultation methods suited to the local context and the anticipated impacts. For a campus-based building project, this typically combines (i) key informant interviews (management, facilities, security, student welfare), (ii) small-group discussions with students/faculty/staff, and (iii) targeted discussions with nearby stakeholders who may experience traffic or nuisance effects during construction. Consultation should be iterative—starting at concept/IEE stage and continuing through construction and early operation via feedback channels and a functioning grievance redress mechanism (GRM).

B. Stakeholder Identification

254. Because the EDC will be developed within the existing BUTEX campus in the Tejgaon Industrial Area (Dhaka-1208), key stakeholder groups include campus users and the immediate surrounding community and service providers. BUTEX is located at 92 Shaheed Tajuddin Ahmed Avenue, Tejgaon Industrial Area, Dhaka-1208; therefore, construction-phase effects (traffic, noise, dust, drainage disruptions) may also be relevant to nearby road users and adjacent land uses.

255. Stakeholders for the EDC IEE are grouped as follows:

- Primary institutional stakeholders (campus decision-makers and implementers): (i) BUTEX senior management (e.g., Vice Chancellor's office, Registrar), academic leadership (Deans/Heads), and administrative units responsible for facility operations and campus services; (ii) Office of Planning

& Development (PnD) (design coordination, planning oversight, interface with contractors and supervision functions); (iii) Campus support services: security, maintenance, cleaning/waste handlers, student welfare, and health/safety focal points (as applicable).

- Project-related stakeholders: Executing/implementing agency (as defined in the financing/implementation arrangements), ADB project team, Design/Construction Supervision Consultant (CSC), contractor(s), and suppliers.

256. Stakeholder identification should be refined after confirmation of the final footprint, access points, work schedule, and any temporary traffic or utility tie-ins.

C. Stakeholder consultation history

1. Consultation with officials of the Finance Department, MoF

257. Consultations with the Finance Department, Ministry of Finance took place in November 2024 at SDCMU established under SEIP. The Project Director (PD) of SEIP who is in charge of SICIP, officials from Finance Department relevant to the project and ADB project team attended the meeting and discussed various aspects of the proposed EDC BUTEX building and possible safeguards system. Discussions on possible 'green building' components and locations of establishment of the EDC BUTEX building were held.

2. Consultation with the BUTEX teachers and students

258. During the time of field visit to BUTEX (January 2025) the technical assistance team sat with the teachers and students and talked to them informally. Discussions took place in various places on the BUTEX campus. The discussions took place on various educational issues, as well as campus environmental issues.

3. Consultations with local residents

259. During the 2nd Field visit in June 2026 the TA team talked to local residents of Begun bari road. Discussions took place in front of the Dhaka Polytechnic jame Mosque. The discussions had evolved around the possibilities of dust and sound pollution.

Table VII-1 Consultation records

FGD no.	Consultation type	Participants	
		Male	Female
01	BUTEX teachers and students	06	02
02	Local residents	08	00
TOTAL		14	02



Figure VII-1 Consultation at BUTEX in January and June 2026. Photo: TA consultants

D. Outcomes of stakeholder consultation

260. **Meetings with Finance department and BUTEX officials**. The technical assistance (TA) team met the MoF and BUTEX several times during project preparation. Apart from the possibilities and process of implementation of the whole project, the points of discussion also included the need assessment of construction of EDC BUTEX Building facilities within the BUTEX campus. The technical assessment team was comprised of an architect, TVET specialist, economist, environment specialist, gender specialist, social specialist and an education reform and implementation expert. Hence the discussions took on many dimensions. This IEE extracted the construction/repair/improvement related activities and environmental concerns from all the discussions. The summary of the discussions is presented in the following Table.

Table VII-2 Summary of the point of discussions with BUTEX teachers and officials

Environment-related discussions and questions	Summary points, discussions and decisions (BUTEX EDC)
Green building integration and campus microclimate	**Key concerns raised:** Heat stress in Dhaka, discomfort in corridors and waiting areas, and the need for shade and greenery around entrances and pedestrian approaches. **Decision/commitment:** Integrate feasible green elements (shade trees, planters, courtyard/edge greening, reflective/low-heat surfaces) that reduce heat gain and improve comfort. **Action items:** (i) Include a landscape/greening plan aligned with campus maintenance capacity; (ii) protect existing trees where possible; (iii) prioritize shading along main pedestrian desire-lines and near building entries.
Natural ventilation and indoor air quality (IAQ)	**Key concerns raised:** Desire to minimize over-reliance on AC while ensuring comfortable training/meeting spaces; concerns about dust infiltration during construction and early operation. **Decision/commitment:** Apply climate-responsive ventilation design (cross-ventilation where feasible, fresh air provision, filtration where required) consistent with Dhaka conditions. **Action items:** (i) Confirm ventilation strategy in detailed design (natural + mechanical hybrid as needed); (ii) define IAQ protections during fit-out (duct protection, filter replacement before occupancy); (iii) specify low-VOC finishes for occupied spaces.
Energy efficiency and solar heat management	**Key concerns raised:** High electricity costs and load-shedding risks; need for lower cooling demand in training rooms. **Decision/commitment:** Prioritize passive solar control (shading, façade treatment, glazing strategy) and high-efficiency equipment. **Action items:** (i) Optimize shading devices/overhangs and glare control; (ii) specify efficient lighting and controls; (iii) assess rooftop solar feasibility subject to structural and roof-use constraints.

Environment-related discussions and questions	Summary points, discussions and decisions (BUTEX EDC)
Sustainable material selection and sourcing	**Key concerns raised:** Interest in low-impact materials but concern about cost premiums and availability. **Decision/commitment:** Use a "best feasible" approach: local sourcing where possible, recycled content where practical, and durability-focused specifications to reduce life-cycle impacts. **Action items:** (i) Develop a procurement checklist for low-VOC materials, certified timber (if used), recycled steel where feasible; (ii) avoid materials with high maintenance burden; (iii) require supplier documentation for key materials.
Construction-phase environmental management (dust, noise, housekeeping)	**Key concerns raised:** Dust and noise impacts on teaching/training; disturbance during exams; complaints often arise when contractors do not enforce good housekeeping. **Decision/commitment:** Adopt prevention-first construction controls with clear contractor obligations and supervision. **Action items:** (i) Site-specific Dust Management Plan (watering, covered stockpiles, covered trucks, track-out control); (ii) Noise & Vibration Management Plan with exam/peak-hour restrictions; (iii) daily housekeeping and drain protection routine; (iv) monitoring and corrective action triggers.
Traffic management and pedestrian safety (campus interface)	**Key concerns raised:** Safety at the site interface and along approach roads during deliveries; need for protected walking paths for students/staff. **Decision/commitment:** Prepare and enforce a Traffic/Transport Management Plan (TTMP) suitable for an active campus. **Action items:** (i) Delivery scheduling (off-peak windows); (ii) trained flaggers at entry/exit; (iii) speed limits and no-idling; (iv) protected pedestrian routes and crossings; (v) maintain emergency access at all times.
Drainage, runoff control, and monsoon preparedness	**Key concerns raised:** Waterlogging and drain blockage risk during monsoon, especially if construction debris/silt enters the drain network. **Decision/commitment:** Maintain drainage continuity and prevent siltation through early and continuous controls. **Action items:** (i) Install silt fences/inlet protection/sediment traps before earthworks; (ii) define temporary drainage routes; (iii) regular drain inspection/cleaning; (iv) ensure safe discharge from dewatering (if required) and avoid erosion/scour at outlets.
Water conservation and water quality protection	**Key concerns raised:** Reliability of water supply and quality; reducing consumption in high-occupancy buildings. **Decision/commitment:** Apply water efficiency in fixtures and operational SOPs; protect water quality during construction and operation. **Action items:** (i) Low-flow fixtures; (ii) leak detection/maintenance; (iii) safe storage and housekeeping in wash areas; (iv) avoid contamination from chemical storage and cleaning agents; (v) consider rainwater harvesting only if it fits maintenance capacity and regulatory acceptability.
Waste management and circular economy (incl. e-waste)	**Key concerns raised:** Mixed waste leads to odor/pests and poor recycling outcomes; need for separate handling of batteries, lamps, and IT-related wastes. **Decision/commitment:** Establish source segregation and dedicated handling for special streams. **Action items:** (i) Floor-wise segregated bins; (ii) a designated, washable waste holding room; (iii) contracted recyclers/authorized handlers; (iv) separate storage for batteries/lamps/toner/e-waste; (v) training for cleaners and facility staff; (vi) tracking of volumes and diversion rate.
Biodiversity and landscape integration	**Key concerns raised:** Preserve existing campus greenery where feasible and avoid unnecessary tree removal; ensure reinstatement after construction. **Decision/commitment:** Minimize vegetation removal and restore disturbed landscape promptly. **Action items:** (i)

Environment-related discussions and questions	Summary points, discussions and decisions (BUTEX EDC)
	Tree protection fencing and root-zone protection; (ii) compensatory planting where removal is unavoidable; (iii) phased restoration of green edges and pedestrian areas after each work stage.
Occupational health and safety (workers)	**Key concerns raised:** High-risk activities (excavation/basement works, lifting, work at height) require strict safety control; poor PPE use is common without supervision. **Decision/commitment:** Implement a robust OHS system under the Contractor's CEMP. **Action items:** (i) Mandatory induction and toolbox talks; (ii) PPE enforcement; (iii) permits-to-work for high-risk tasks; (iv) emergency response and first-aid readiness; (v) incident reporting and corrective action.
Public health and safety, including GBV/SEA/SH risk management	**Key concerns raised:** Keeping students/public safe from worksite hazards; concerns about worker behavior if non-local labor or camps are used. **Decision/commitment:** Secure site boundaries and enforce codes of conduct and grievance pathways. **Action items:** (i) Site fencing, signage, guarded access; (ii) safe pedestrian detours; (iii) Worker Code of Conduct; (iv) supervisor accountability; (v) clear and confidential reporting channels; (vi) avoid camps where feasible or enforce strong camp management standards if needed.
Stakeholder engagement and grievance redress mechanism (GRM)	**Key concerns raised:** Need for a clear point of contact and timely resolution of complaints (dust/noise/access safety). **Decision/commitment:** Maintain transparent communication and a functional GRM during construction and early operation. **Action items:** (i) Display contact details at the site and online; (ii) weekly look-ahead notices for disruptive activities; (iii) log and respond to grievances within defined timelines; (iv) periodic feedback meetings with campus reps.
Climate resilience and adaptation	**Key concerns raised:** Heavy rainfall events, heat stress, and service disruptions (power/water) are increasing; the building should function under extremes. **Decision/commitment:** Integrate practical resilience features into design and O&M. **Action items:** (i) robust drainage capacity and maintenance access; (ii) heat reduction measures (shading, ventilation strategy); (iii) emergency preparedness (backup power for critical systems if applicable); (iv) clear evacuation and safety procedures for events.
Environmental monitoring and compliance	**Key concerns raised:** Stakeholders prefer measurable monitoring and transparent reporting rather than "promises." **Decision/commitment:** Establish monitoring and reporting proportional to risk. **Action items:** (i) baseline checks (noise/dust where relevant); (ii) monitoring during high-impact activities; (iii) documented corrective actions; (iv) regular compliance reporting to the supervising entity and campus focal points.
Green certification/performance targets (if pursued)	**Key concerns raised:** Certification can add cost; stakeholders prefer tangible performance outcomes. **Decision/commitment:** If certification is pursued, adopt a phased or "performance-first" approach. **Action items:** (i) Define a realistic set of performance targets (energy, water, waste diversion); (ii) incorporate metering and monitoring to verify outcomes; (iii) avoid design elements that cannot be maintained.
Technology integration for sustainability (smart metering/controls)	**Key concerns raised:** Smart controls can reduce wastage but require maintenance capacity. **Decision/commitment:** Use "appropriate technology" that can be operated and maintained by campus staff. **Action items:** (i) Energy and water sub-metering; (ii) basic BMS controls where feasible; (iii) training and O&M manuals; (iv) maintenance budget provisions.

Environment-related discussions and questions	Summary points, discussions and decisions (BUTEX EDC)
Site context and any cultural/heritage sensitivities	**Key concerns raised:** No known heritage constraints at the site, but stakeholders requested caution during excavation. **Decision/commitment:** Apply a chance-find procedure. **Action items:** (i) Include chance-find steps in the CEMP; (ii) stop-work and notify protocol if unexpected items are found.

E. Future Stakeholder Engagement and disclosure

261. Disclosure. After approval of the IEE, ADB will disclose the document on its website in accordance with its Public Communications Policy (2011), allowing public access at no cost. Disclosure should be repeated if there are material changes in location, footprint, design, construction method, or schedule that require formal updating of the IEE and the Environmental Management Plan (EMP)/ESMP. During implementation, BUTEX (through the Project Implementation arrangements) should disclose key milestones in advance—particularly the start of construction, major traffic management changes, and any planned temporary service interruptions (e.g., utility tie-ins). Semiannual environmental monitoring reports submitted to ADB will also be disclosed on ADB's website, consistent with ADB disclosure practice and policy.

262. Consultations. In line with ADB SPS (2009), consultation is an ongoing and iterative process throughout the project cycle and should be proportionate to the project's risks and impacts. For the BUTEX EDC, consultations are especially important at key "inflection points," including: (i) during detailed design if any major footprint, access, or building-system changes could alter environmental or social impacts; (ii) prior to construction, with emphasis on traffic/pedestrian safety, dust/noise control, drainage protection during monsoon, and worker/community health and safety; (iii) prior to commissioning and operation, focusing on operational waste management (including e-waste streams), emergency preparedness, security, and facility O&M arrangements; and (iv) following any significant incident or emergency related to construction activities. Additional consultation rounds should be organized by BUTEX, supported by the safeguards function within the project implementation structure (e.g., PMU/PIU safeguards staff or Safeguards Oversight Unit, as applicable).

263. Targeted engagement for nearby residents and gate users. As raised during campus discussions, the project has potential interaction with nearby residents and gate users because access patterns and pedestrian movements may change during construction and in operation—particularly if an adjacent gate is used by EDC users. Therefore, the next rounds of engagement should prioritize project-affected persons and immediate neighbors, including local residents, small traders, transport operators/drivers, and others who use the approach routes. Engagement should combine: (i) broader meetings where feasible to capture a wide range of stakeholders; and (ii) targeted tools such as short community walk-throughs, focused discussions near access points, and brief structured surveys to identify safety concerns (crossings, truck turning areas, lighting), nuisance risks (dust/noise), and expectations regarding working hours and grievance channels. Where public health constraints apply, smaller group formats and staggered sessions should be used to ensure inclusivity without compromising safety.

264. Roles and accessibility of information. The Executing/Implementing Agency arrangements will provide written authorization/endorsement to ADB for disclosure of safeguard documents as required. BUTEX/PIU will make relevant safeguards information available in a timely manner, at accessible locations (e.g., campus notice boards, PIU office, and website), and

in formats and language understandable to affected people and stakeholders. Where literacy barriers exist, appropriate alternative methods (visual materials, verbal briefings, or community facilitation) will be used. Disclosure and engagement activities will follow ADB SPS (2009) requirements and the ADB Public Communications Policy (2011)[57].

[57] https://www.adb.org/sites/default/files/institutional-document/32904/files/pcp-2011.pdf

VIII. GRIEVANCE REDRESS MECHANISM

A. Grievance Redress Mechanism

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

266. **First level of GRM:** The first level and most accessible and immediate contact for the fastest resolve of grievances are the Contractors, with assistance from Design Supervision Consultants (DSC) on site. Prior to construction of any works, the PIU will ensure local community meetings are held to notify residents and businesses of any temporary disturbances, and to inform them of the Project and the GRM. If any complaints arise, the Contractors, with assistance from DSC can immediately resolve the complaint on site. The Contractor's and DSC's office phone number will be posted in public areas within the subproject areas and construction sites. Any person with a grievance related to the project work can contact the project to file a complaint. The Contractor may seek the assistance of the DSC safeguards specialists (the environmental specialist or social safeguards specialist) to resolve the issue. The DSC safeguards (environment and resettlement) focal person will immediately address and resolve the issue with the Contractor within 1-2 days, if the complaint remains unresolved at the field level. The PIU safeguards focal person will fully document the following information: (i) name of the person; (ii) date complaint was received; (iii) nature of complaint; (iv) location, and (v) how the complaint was resolved.

267. **Second level of GRM:** Should the grievance remain unresolved; the Contractor with assistance from DSC will forward the complaint to the PIU safeguards focal person. The person filing the grievance will be notified by DSC safeguards focal person that the grievance was forwarded to the PIU safeguards focal person. The PIU will address the grievance. Grievances will be resolved through continuous interactions with affected persons, and the PIU will answer queries and resolve grievances regarding various issues including environmental or social impacts. Corrective measures will be undertaken at the field level by the PIU safeguards focal person within 7 days. He/she will fully document the following information: (i) name of the person; (ii) date the complaint was received; (iii) nature of complaint; (iv) location and (v) how the complaint was resolved.

268. **Third level of GRM:** Should the grievance remain unresolved, the PIU's project director will activate the third level of the GRM by referring the issue (with written documentation) to a Grievance Redress Committee (GRC), which will, based on review of the grievances, address them in consultation with the PIU, Contractor, DSC, and affected persons. The GRC will consist of TMED/IA representative as chairperson, and other relevant stakeholders. A meeting will be called with the GRC, if necessary, where the affected person can present his/her concern and issues. The process will promote conflict resolution through mediation. The GRC will meet as necessary when there are grievances to be addressed. The GRC will suggest corrective measures at the field level and assign clear responsibilities for implementing its decision within 15 days. The functions of the GRC are as follows: (i) to provide support to affected persons on problems arising from environmental or social disruption, asset acquisition (where required), and

eligibility for entitlements, compensation, and assistance; (ii) to record grievances of affected persons, categorize and prioritize them, and provide solutions within 15 days; and (iii) to report to the aggrieved parties' developments regarding their grievances and decisions of the GRC. The TMED/IA safeguards focal person will be responsible for processing and placing all papers before the GRC, recording decisions, issuing minutes of the meetings, and taking follow-up action to see that formal orders are issued, and the decisions carried out.

269. Safeguard monitoring reports will include the following aspects pertaining to progress on grievances: (i) number of cases registered with the GRC, level of jurisdiction (first, second, and third levels), number of hearings held, decisions made, and the status of pending cases; and (ii) lists of cases in process and already decided upon may be prepared with details such as affected person, date of notice, date of application, date of hearing, decisions, remarks, actions taken to resolve issues, and status of grievance (i.e. open, closed, pending). All costs involved in resolving the complaints (meetings, consultations, communication and reporting / information dissemination) will be borne by the TMED/IA.

270. Where an affected person is not satisfied with the outcomes of the 3 levels of the Project GRM, the affected person should make good faith efforts to resolve issues working with the South Asia Regional Department through ADB's Bangladesh Resident Mission. As a last resort, the affected person can access ADB's Accountability Mechanism (ADB's Office of Special Project Facility or Office of Compliance Review). ADB's Accountability Mechanism, including information on how to file a complaint, will also be explained to affected households.

271. The grievance redress mechanism and procedure are depicted in Figure VIII-1.

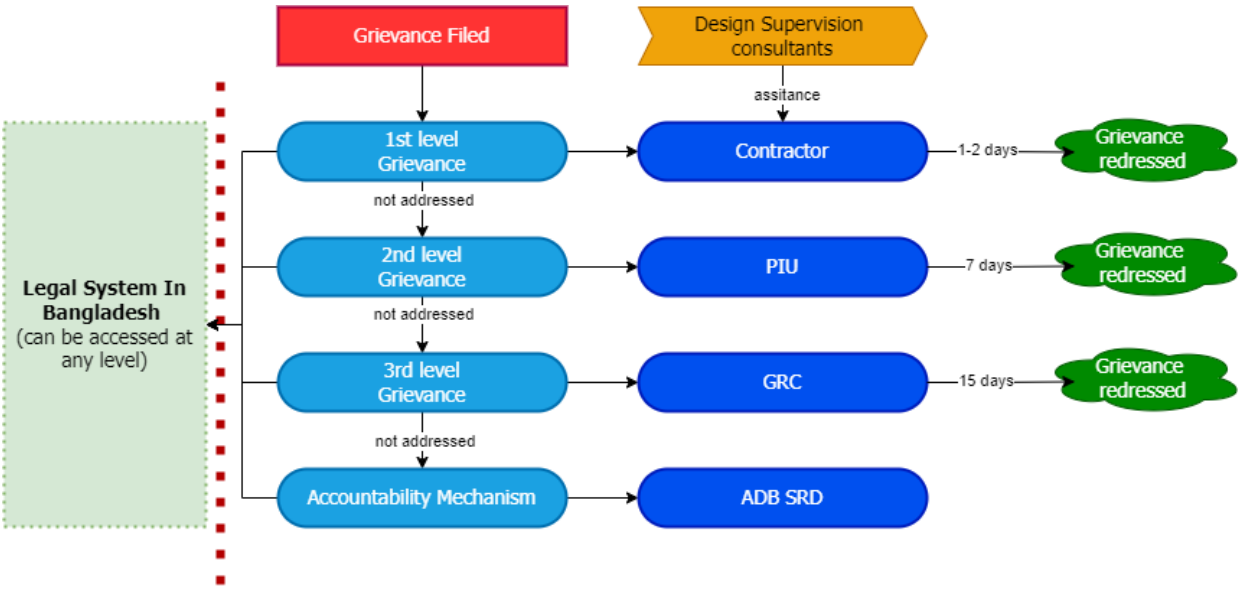


Figure VIII-1 Grievance Redress Mechanism (GRM) adopted for SICIP

272. **Access to Country's legal system.** An aggrieved person shall have access to the country's legal system at any stage, and accessing the country's legal system can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM.

B. Administration of Grievance Redress Mechanism

273. The SOU shall be responsible for making the public aware of the GRM in all project locations, explaining how it works and how to use it, and maintaining its accessibility and operability for the full duration of the construction phase and the defects period. Public awareness campaigns should be carried out at the local level in advance of the start of civil works. Contact information, including for written, telephone and in-person filing of grievances, shall be firmly established at the GRM's inception, and kept up to date and publicly available through the end of the defects period.

274. Records of grievances received, corrective actions taken, and their outcomes will be properly maintained by the SOU in a central grievance redress database. Grievances and resolutions will be included in the EAs' quarterly progress reports and the semi-annual environmental monitoring reports submitted to ADB. Any fatal accidents involving the project's implementation or project sites should be reported to the GRC and ADB immediately. The costs of operating the GRM will be very modest, and will be covered by the operating budget of the SOU.

C. Grievance Redress Mechanism for Workers

275. An additional mechanism shall be set up by the SOU to accept and address complaints from workers employed in the construction works, concerning working conditions, living conditions in construction camps, safety and health issues, labor rights violations, mistreatment, or any other matter. All laborers, skilled workers, and site engineers employed on site by the primary Contractor or by any of its sub-Contractors shall have access to the mechanism. All workers will receive an orientation to the workers' GRM during pre-construction induction training. Workers will be able to lodge grievances with on-site personnel of the CSC, who will record the complainant's name, position, employer, and contact information, as well as a description of the complaint and the time, date and place at which the complaint was reported. The CSC will inform the SOU, which will record the grievance in a grievance register. The CSC will convene a meeting of the complainant or complainants, the sub-Contractor involved, the Primary Contractor, and any labor syndicate to which the complainant(s) may belong, in an effort to decide on an appropriate resolution of the complaint. The CSC will work with the relevant Ministry, Environmental Safeguards Focal Person at SDCMU and on-site Environment, Health and Safety Officer to monitor implementation of the proposed resolution and confirm absence of retaliation on the part of the Contractor involved. If the complaint cannot be resolved to the satisfaction of the complainant(s), the CSC will provide the complainant(s) with the necessary contact information to file a complaint with MOLE. The CSC will compile a complete record of grievance, including measures taken for resolution and follow-up checks by the ESFP and EHSO, as well as any referral to MOLE and subsequent evolution of the case, and provide the record to the SOU for preservation in its grievance register.

IX. ENVIRONMENTAL MANAGEMENT PLAN

A. Objectives of The Environmental Management Plan

276. This environmental management plan (EMP) has been prepared for the ADB supported SICIP in accordance with the ADB SPS (2009). Specific measures are developed in relation to the design, construction and operation of each project component, to address the physical, biological, cultural and socio-economic impacts identified and discussed in the chapter on Anticipated Impacts and Mitigation Measures of the Initial Environment Examination (IEE) report.

277. The EMP for the project defines mitigation and monitoring measures and identifies the institutions, responsibilities and mechanisms that will ensure their implementation. Such institutions and mechanisms will seek to ensure continuous improvement of environmental protection activities during the pre-construction, construction, and operation phases of the project, in order to manage adverse impacts.

278. The EMP's purpose is served by fulfilment of several key objectives:

(i) To present a comprehensive and systematic list of measures for mitigating and enhancing anticipated environmental and social impacts, as discussed and prescribed in Chapter VI of the IEE;
(ii) To define and specify institutional arrangements to support implementation of the prescribed measures;
(iii) To clearly assign responsibility for implementation of each prescribed measure;
(iv) To clearly assign responsibility for systematic monitoring of implementation of the prescribed measures and overseeing corrective action as needed;
(v) To establish a system for regular reporting on EMP implementation;
(vi) To identify training and capacity-building needed to enable effective implementation of the EMP; and
(vii) To provide sound estimates of the costs that will have to be budgeted by various entities to enable full and effective implementation of all prescribed measures to address likely impacts.

B. Roles and Responsibilities in EMP Implementation

279. Effective implementation of the EMP relies on inputs from multiple entities, spanning the pre-construction, construction and operation phases of the project. Specific tasks are identified and assigned in the next section of the EMP, but the roles and responsibilities are explained in general terms below, beginning with an outline of the entities that are to be involved.

1. Key Institutional Entities

a. Skills Development Coordination and Management Unit (SDCMU)

280. The Skills Development Coordination and Management Unit (SDCMU) established under SEIP will act as the Project Management Unit (PMU) for the Ministry of Finance. The SDCMU will host the Safeguards Oversight Unit (SOU) in charge of implementing the EMP. The SDCMU will consist of the Project Director (PD) as overall coordinator, Assistant Project Direction (APD) heading the SOU, an Environmental Specialist, A gender Specialist and a Social Specialist.

b. Project Implementation Unit (PIU) at BUTEX

281. A PIU will be established at BUTEX to enable coordinated management of the Investment Project, including implementation of the EMP. The PIU is a vital mechanism for ensuring coordination and cooperation between the SDCMU and the Implementing Partner agencies participating in infrastructure development at each investment location. The PIU will appoint a Project Manager to drive successful implementation of the work, including meeting all safeguards' requirements. The PIU can be established under SDCMU.

c. Safeguards Oversight Unit (SOU) at SDCMU

282. A central safeguards implementation function is considered critical to effective implementation of the EMP, including monitoring compliance with all safeguard's requirements of the ADB and national government at multiple locations, most of which will see infrastructure development activities carried out by the SDCMU at Ministry of Finance (MoF). The central SOU will be established under the SDCMU, and the location specific SOU will be established at BUTEX. While the central SDCMU should be staffed by at least one senior environmental professional known as the Environmental Safeguards Focal Person (ESFP), the PIU at BUTEX should be staffed with at least 2 environmental professionals, one for overall coordination at site, one specially dedicated to day-to-days site supervision known as the Environment, Health and Safety Officer (EHSO).

d. Environmental Safeguards Focal Person (ESFP)

283. The SDCMU will have a designated Environmental Safeguards Focal Person (ESFP), whose role will be to oversee the safeguards compliance process for all Investment Project sites under the SDCMU's control, heading the central SOU and liaising with the other SOUs at all investment sites while supported by Environment, Health and Safety Officers (EHSOs) working in the field. The ESFP may appropriately be a Deputy Project Director (DPD) or other senior managers or engineers within the SDCMU and will answer directly to the SDCMU's Project Director (PD). The ESFP will work closely with the SDCMU, DOE and ADB Safeguards team to ensure that safeguards requirements are included and effectively addressed as part of Project implementation at this location.

e. Environment, Health and Safety Officer (EHSO)

284. The PIU at BUTEX will designate an EHSO, answering and supporting the ESFP as well as the designated coordinator from the Finance Division itself, to oversee EMP implementation at the proposed BUTEX site. The EHSO may appropriately be assistant engineers with other duties in the case of PIU with only small investments under the Investment Project, but where this is the case, it is critical that adequate time and resource allocations for its EHS responsibilities are firmly established in their job descriptions. In most cases it will be preferable for the EHSO to be a dedicated staff position or consultant. A proposed Terms of Reference (ToR) for the EHSO position is presented in Appendix 17. The EHSO may be appointed to cover more than one location, where this is deemed feasible in view of proximity and the scale of works in each location.

f. Construction Supervision Consultants (CSCs)

285. One or more Construction Supervision Consultants (CSCs) will be engaged by the PMU to monitor, guide and support the work of construction Contractors carrying out the works under

the Investment Project. The CSC(s) will have environmental specialists on staff to assist SDCMU with environmental matters and ensure strong environmental compliance. The CSC should be required to maintain a site office at each investment location, to enable its inspectors and site engineers to maintain a daily presence at each active construction site.

g. Contractors

286. The planned work is to be packaged and tendered as contracts. As the planned infrastructure components are each of relatively limited scale, work at multiple locations may be grouped under single contracts. Primary Contractors will be required to develop a Contractor Environmental Management Plan (CEMP) covering the construction works under their control, including work carried out by their sub-Contractors. Each primary civil works Contractor will designate an EHS Representative, who will oversee the implementation of the CEMP at all sites under the Contractor's control, including regular monitoring of site conditions and effective implementation of prescribed mitigation measures by both the primary Contractor and all sub-Contractors.

h. Department of Environment

287. As a key regulator of industry, the DOE is mandated to review and approve infrastructure proposals based on consideration of possible environmental effects. The agency remains involved throughout a project's life cycle, during which environmental clearances must be annually renewed, with environmental monitoring results being a key reference point in renewal decisions.

i. ADB

288. As the financing institution, ADB will exercise its due diligence and oversight functions, and maintain strong interaction with the PSC, SDCMU and SOU.

2. Responsibilities in EMP Implementation

289. Each of the entities identified above has multiple responsibilities, the fulfilment of which is required for full and effective implementation of the EMP. These responsibilities are detailed in Table IX-1 below.

Table IX-1 EMP implementation responsibilities

Entity	Responsibilities in EMP Implementation
Skills Development Coordination and Management Unit (SDCMU)	• Prepare operations and maintenance procedures for facilities under construction, ensuring their compliance with the EMP • Work with the SOU to train facility personnel on EHS aspects of facility operation in advance of commissioning, to ensure effective EMP implementation during the operation period
Project Implementation Unit (PIU) at BUTEX	• Ensure that EMP implementation is recognized as a critical element of overall project implementation • Enable and adequately staff SOU • Oversee rigorous review of bids and prioritize selection of Contractors with strong environmental compliance track records • Coordinate with SDCMU as needed to ensure smooth implementation of EMP

Entity	Responsibilities in EMP Implementation
Safeguards Oversight Unit (SOU) under SDCMU	• Ensure EMP provisions are fully reflected in civil works bid documents • Advise and support PIU on Contractor selection and other procurement decisions • Guide and support ESFP and EHSOs to ensure timely and competent execution of site-level oversight activity • Collect and collate progress reports and environmental monitoring reports for each location to assemble comprehensive quarterly monitoring reports for submission to ADB. • Work with CSCs and primary Contractors to develop and deliver periodic EHS training for sub-Contractors and their workers • Work with CSCs to train facility managers or their EHS personnel in advance of commissioning, to ensure effective EMP implementation during the operation period • Administer the GRM • Support PMUs in obtaining environmental clearances and renewals
Environmental Safeguards Focal Person (ESFP) under SDCMU	• Oversee the safeguards compliance process for all Investment Project sites under the PMU's control, liaising with the PIU-appointed Project Manager and with support from SOU and EHSO • Prepare and submit quarterly progress reports for the sites owned by their home agencies to the PIU and SOU • Chair GRC when needed to address Level 2 grievances regarding project implementation activities
Environmental coordinator/manager at BUTEX	• Oversee the safeguards compliance process for the investment site at BUTEX • Liaison with the ESFP for monthly report and day to day update • Supervise the EHSO
Environment, Health and Safety Officer (EHSO)	• Conduct regular monitoring of conditions on site, including compliance with prescribed mitigation strategies, and submit EHS monitoring reports on a monthly basis to the Environmental Coordinator at PIU • Identify worker training needs and support SOU and CSC in development and delivery of training
Construction Supervision Consultants (CSC)	• Review and approve CEMPs and quarterly environmental monitoring reports submitted by Contractors • Guide and assist PMUs, through ESFPs, in monitoring of CEMP implementation and site conditions, including preparation of quarterly progress reports for submission to SOU • Direct and supervise corrective action by Contractors as needed • Collaborate with SOU on development of safeguards training for sub-Contractors and workers
Contractors	• Prepare and implement CEMP for each site, based on EMP prescriptions and international best practices • Conduct quarterly EHS monitoring on all sites under their control and submit quarterly monitoring reports to CSC for review • Implement corrective actions as directed by CSC and/or ESFP
Department of Environment (DOE)	• Review environmental clearance applications, including IEE and EMP • Review annual environmental monitoring reports submitted by SOU during construction phase • Review applications for environmental clearance renewals
ADB	• Review and approve IEE and EMP • Publicly disclose IEE on ADB website • Review quarterly environmental monitoring reports prepared by PMU and publicly disclose them on ADB website

290. The intersecting roles and responsibilities in EMP implementation during the construction phase - including monitoring of implementation - are further illuminated in Figure IX-1 below. During the operation phase, EMP implementation is simplified considerably, as the temporary entities formed or engaged to carry out and oversee the construction process are wound down or move on to other projects, and permanent entities assume responsibility for ensuring that the

EMP continues to guide infrastructure operations and maintenance. Responsibilities for EMP implementation in the operation phase are also shown in Figure IX-1.

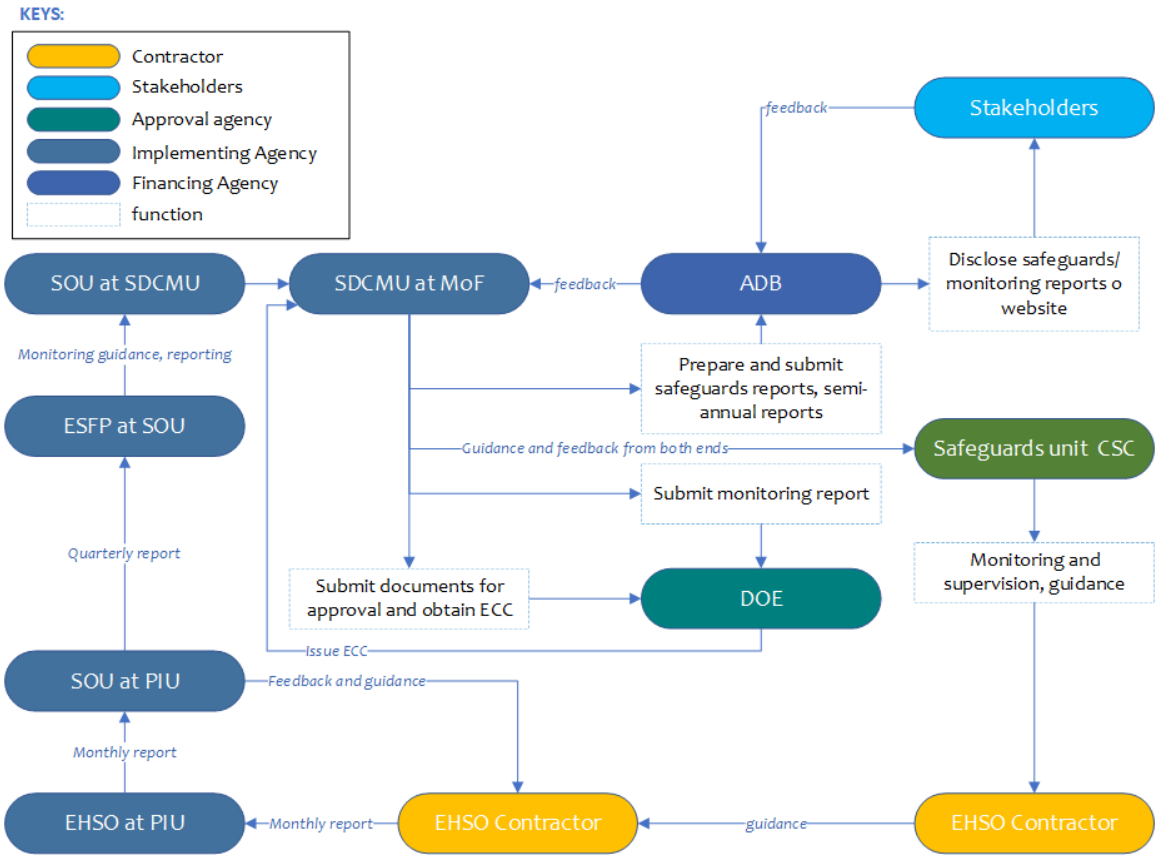


Figure IX-1 EMP implementation responsibilities during construction and operation phase adopted for SICIP

3. Assessment of Project Readiness

291. Before construction, the ESFP will assess the project's readiness in terms of environmental management based on a set of indicators (Table IX-2) and report it to the ADB and the SDCMU. This assessment will verify that environmental commitments are being carried out and environmental management systems are in place before construction starts, or if this is not the case, propose corrective actions to ensure that all requirements are met.

Table IX-2 Indicators of project readiness in relation to environmental management

Indicator	Criteria	Assessment	
DoE approval	• DoE approves the IEE and ECC is being obtained	Yes	No
EMP update	• The EMP is updated after detailed designs are approved, and approved by ADB and DoE	Yes	No

Indicator	Criteria	Assessment	
Compliance with loan covenants	• The borrower complies with loan covenants related to project design and environmental management planning	Yes	No
Public involvement effectiveness	• Meaningful consultation completed • GRM established at entry point	Yes	No
Environmental supervision in place	• PIU supervision in place	Yes	No
Bidding documents and contracts with environmental safeguards	• Bidding documents and contracts incorporating the environmental activities and safeguards listed as loan assurances • Bidding documents and contracts incorporating the impact mitigation and environmental management provisions of the EMP	Yes	No
Contractor readiness	• Contractor EMPs (CEMPs) have been prepared and approved by PIU and PMU • Environmental, Health and Safety Management Plans (EHSMP) established for construction sites • Environment, Health and Safety Officers appointed • Assessment of potential disruption to utilities services conducted • Stakeholder interviews conducted to confirm issues if services are disrupted	Yes	No
EMP financial support	• Required funds have been set aside to support the EMP implementation according to the financial plan	Yes	No

C. Environmental Impacts and Prescribed Mitigation and Enhancement Measures

292. The findings of the environmental impact analysis are presented in Section VI of the IEE report. The potential impacts and corresponding measures that are prescribed in order to mitigate the negative impacts or enhance positive ones are collected in Table IX-3 below. The measures prescribed apply to the pre-construction, construction and operations phases of the infrastructure development at the EDC BUTEX site. All measures listed in Table IX-3 are requirements, based on the infrastructure plan as proposed at the time of preparation, whose fulfillment is assigned. All measures assigned to Contractors should be reflected in bidding documents, and serve as the basis for the CEMPs, which must be prepared to cover all sites at this investment location.

Table IX-3 Prescribed environmental mitigation and enhancement measures

KEYS: ADB: Asian Development Bank; CSC: Construction Supervision Consultant; Con: Contractor; DOE: Department of Environment; EAs: Executing Agencies; EHSO: Environment, Health and Safety Officer; ESFP: Environmental Safeguards Focal Person; NQC: No Quantifiable Cost; PIU: Project Implementation Unit; SOU: Safeguards Oversight Unit; TMED: Technical and Madrasa Education Division; BUTEX: Bangladesh University of Textile Engineering, EMP: Environmental Management Plan, EMoP: Environmental Monitoring Plan; EDC: Executive Development Center

Parameter	Potential impacts and/or issues	Mitigation/enhancement measures	Implementing entities	Supervision responsibility	Performance indicators	Estimated cost in BDT
A. PRE-CONSTRUCTION PHASE						
(i) IMPLEMENTATION READINESS						
1. IEE and EMP update	Changes in floor functions/layout (labs, classrooms, office areas), roof solar/garden, utility areas, or campus interfaces not captured after approval	- Re-screen IEE/EMP against final working drawings and any value-engineering changes. - Confirm EMP includes controls for lab floors (WPE Lab, Central Research Lab, multiple labs) and roof solar/garden. - Update EMoP locations to include roof utility/roof garden zones and basement/parking-EME interfaces.	SDCMU	SDCMU/PIU	- EMP/EMoP "gap list" prepared & closed before bid award. - Written confirmation that lab/roof features are covered (chemical safety, drainage, waste).	NQC (Included in SDCMU budget)
2. Confirmation of NOCs from local agencies and authorities	Delays or non-compliance if campus/utility/traffic or fire safety clearances/NOCs are incomplete	- Confirm BUTEX land ownership/site handover documentation and campus NOC for construction access/working hours. - Confirm approvals/NOCs needed for basement parking + EME, lifts, and fire safety (BNBC B1 building type).	SDCMU	SDCMU/PIU	- NOC register maintained (issuing authority, ref no., validity, conditions). - Site handover minutes signed by BUTEX + PIU.	NQC (Included in SDCMU budget)
3. Verification of environmental clearances	Project work will not be in compliance with national environmental laws if clearances are not obtained prior to site clearing	- Confirm Site Clearance Certificate (SCC) and Environmental Clearance Certificate (ECC) have been granted, and that any conditions imposed by DOE on approval have been reflected in EMP and EMoP, as well as CEMP as applicable	SDCMU	SDCMU/PIU	- SCC and ECC granted - New measures added to EMP, EMoP and CEMP if needed to meet any conditions of approval specified by DOE	NQC (Included in SDCMU budget)
4. CEMP verification	Mitigation will be inadequate if the CEMP is not fully specified	- Prior to construction commencement, conduct a thorough review and validation of the CEMP to ensure all primary Contractor environmental responsibilities are comprehensively defined and aligned with the specific requirements of the EDC BUTEX Building project	SDCMU/CSC	SDCMU/PIU	- Any necessary changes requested, and made by Contractor - CEMP confirmed adequate by reviewers	NQC (Included in SDCMU budget and CSC amount)
5. Specialized plans verification	Mitigation will be inadequate if specialized plans have not been	Confirm that the following specialized plans have been prepared by the Contractor: - site-specific Construction Camp Management Plan(s)	SDCMU/CSC	SDCMU/PIU	- All required specialized plans prepared to adequate standard and approved by	NQC (Included in SDCMU budget and CSC amount)

Parameter	Potential impacts and/or issues	Mitigation/enhancement measures	Implementing entities	Supervision responsibility	Performance indicators	Estimated cost in BDT
	formulated to manage key impacts	- site-specific Waste Management Plans (embedded within CEMP) - site-specific Emergency Response Plans (embedded within CEMP) - Compensatory Tree Planting Plan - Construction Traffic Management Plan - Soil Erosion Prevention Plan - Site Reinstatement Plan - Occupational Health and Safety Plan (including COVID-19 measures stipulated by ADB and Government of Bangladesh Guidance for Social and Institutional Containment and Prevention) - Waste Management Plan			relevant authority (as required in some cases)	
6. Grievance Redress Mechanisms	Members of the public and workers require a fair and transparent means of getting resolution to complaints about some aspect of the project's implementation	- Confirm that a central GRM and workers' GRM have been established and publicized	SDCMU/CSC	SDCMU/PIU	- Central GRM established and publicized - Workers' GRM established and explained to workers before the start of construction	NQC (Included in SDCMU budget)
7. EMP training	Weak implementation due to low awareness of site constraints & lab-building complexity	- Mandatory induction for Contractor management + EHSO + subcontractors (glazing, lifting, MEP). - Special modules: dust/noise, campus pedestrian safety, working at height, waste segregation, incident reporting. - Quarterly refreshers.	SDCMU/CSC	SDCMU/PIU	- Attendance sheets + training materials filed. - Quarterly refresher evidence; corrective actions reduced over time.	EMP training included in the EMP as contractor's cost. See Table IX-8. Refresher's training shall be within contractor's cost
(ii) DESIGN						
8. Climate change mitigation	High cooling loads from extensive glazing; inefficient façade increases operational GHG; embodied carbon from RCC/finishes	- Confirm façade strategy uses louvers + curtain glass systems with shading intent maintained during value engineering. - Require energy modeling at detailed design stage; specify high-efficiency HVAC and controls (zoning by floor function: labs vs classrooms vs halls).	CSC Con	MoF, SDCMU-ESFP	- Energy model submitted; EUI target set and tracked at commissioning. - Façade shading elements installed as designed (no deletion).	NQC

Parameter	Potential impacts and/or issues	Mitigation/enhancement measures	Implementing entities	Supervision responsibility	Performance indicators	Estimated cost in BDT
		- Materials: prioritize local procurement and low-VOC finishes; optimize RCC quantities without compromising safety.			- Low-VOC compliance certificates for major finishes/adhesives.	
9. Climate change adaptation	Infrastructure use limitations, damage, and environmental hazards due to changing conditions	- Integrate lightning arrester in building design - Design facilities so that critical components (including laboratory, backup generator and fuel tanks) are well above maximum flood level foreseen under climate change projections specified in Climate Risk and Adaptation Assessment (CRA) report and detailed hydrological study - Incorporate temperature-moderating features in BUTEX facility designs, including: - Green roofs where feasible - maximize use of wide-crowned shade trees in site landscaping plans, including around buildings and parking area medians - maximize cross-ventilation by using courtyards, openable windows and favorable building orientation	CSC Con	MoF, SDCMU-ESFP	- All critical facility components above maximum expected flood level - All feasible temperature-moderating features incorporated in facility designs	NQC (included in CSC + Con costs)
10. Flora and fauna	Unnecessary loss of trees during site development	- Incorporate existing trees into site designs to the greatest extent possible, including them in design drawings so they are protected during clearing and construction - When trees must be removed, specify planting of compensatory trees elsewhere on site, including these in drawings and in the Bill of Quantities, in accordance with the approved Compensatory Tree Planting Plan	CSC Con	MoF, SDCMU-ESFP	- Existing trees incorporated in designs to extent possible - Compensatory trees specified in design drawings and Bill of Quantities, in accordance with the approved Compensatory Tree Planting Plan	NQC (included in CSC + Con costs)
11. Water conservation & recharge	High water demand from labs + users; increased stress on groundwater	- Rainwater harvesting from roof for non-potable uses where feasible (landscape/cleaning). - Low-flow fixtures; leak detection; metering by major uses (labs vs domestic). - Landscape drought-tolerant planting.	CSC Con	MoF, SDCMU-ESFP	- Water balance prepared; storage sizing documented. - Fixture schedule meets efficiency targets; meters installed.	NQC (included in CSC + Con costs)
12. Surface water quality	Sediment-laden runoff during construction; post-construction runoff from roof/plaza areas; clogging	- Detail roof drainage and downpipes; include leaf guards/silt traps during construction and O&M access. - Separate “clean” roof runoff from any service/chemical handling zones (if any). - Protect campus drains from construction silt via traps.	CSC Con	MoF, SDCMU-ESFP	- Drainage drawings include traps/cleanouts and access. - No repeated campus drain blockages attributable to site.	NQC (included in CSC + Con costs)
13. Air quality	Elevated dust in minerals storage area	- Include water supply to minerals storage area, with hose spigots in several locations around the perimeter to enable use of mobile misting apparatus	CSC Con	MoF, SDCMU-ESFP	- Detailed design includes water supply to minerals storage area, with multiple	NQC (included in CSC + Con costs)

Parameter	Potential impacts and/or issues	Mitigation/enhancement measures	Implementing entities	Supervision responsibility	Performance indicators	Estimated cost in BDT
					hose spigots spaced around perimeter	
14. Public health and safety	Elevated risk of viral infection in NATI area	- Design internal layout of the BUTEX building to maximize space between users and prevent the formation of long lines in indoor spaces - Design BUTEX building ventilation system for maximum feasible turnover of indoor air	CSC Con	MoF, SDCMU-ESFP	- EDC building designed to maximize space between users and prevent formation of long indoor lines - EDC building ventilation system designed for maximum feasible turnover of indoor air	NQC (included in CSC + Con costs)
15. OHS (vehicle emissions in semi-enclosed areas)	Basement parking/EME areas accumulate exhaust; staff exposure	- Provide mechanical ventilation/CO monitoring for basement parking; ensure exhaust discharge locations do not affect air intakes.	CSC Con	MoF, SDCMU-ESFP	- Basement ventilation calculations and CO monitoring included. - Testing & commissioning pass.	NQC (included in CSC + Con costs)
16. OHS / infection control (workplaces)	Staff exposure to communicable diseases in dense office/classroom use	- Provide handwashing points and ventilation strategy; maintain flexible space planning for crowd management.	CSC Con	MoF, SDCMU-ESFP	- Hygiene provisions installed; O&M plan includes IAQ maintenance schedule.	NQC (included in CSC + Con costs)
17. Laboratory EHS (critical for EDC)	Chemical exposure, spills, incompatible storage, hazardous waste generation on lab floors	- Applicable because building includes WPE Lab (1st floor), Central Research Lab (2nd floor), and multiple labs on other floors. - Design must include: - chemical storage with segregation + secondary containment; - fume extraction / local exhaust where needed; - eyewash/shower points and spill kits; - safe drains/collection (no uncontrolled discharge of chemical wastes).	CSC Con	MoF, SDCMU-ESFP	- Lab EHS design review completed by competent specialist. - Lab commissioning checklist signed (ventilation, storage, emergency equipment).	NQC (included in CSC + Con costs)
18. Waste management	Pollution from inadequately managed wastes	- Anticipate waste streams and incorporate design features to collect, sort and safely dispose of each class of waste - Specify segregated collection bins in strategic indoor and outdoor locations where waste is generated - Include waste storage and sorting areas in facility designs - Incorporate easy access for waste and recyclables collection vehicles - Designate outdoor space for thermophilic composting of organic waste from kitchens and canteens	CSC Con	MoF, SDCMU-ESFP	- Facility designs include spaces and features for waste management, including collection, sorting, composting, storage and out-shipment - Laboratory design provides for at-source segregation of hazardous liquid and solid wastes	NQC (included in CSC + Con costs)

Parameter	Potential impacts and/or issues	Mitigation/enhancement measures	Implementing entities	Supervision responsibility	Performance indicators	Estimated cost in BDT
		- Design laboratory for appropriate segregation of hazardous and non-hazardous waste streams				
(iii) PROCUREMENT						
19. Selection of CSC and Contractor, EMP training	Poor safeguards performance by contractor causes repeated non-compliance in dense campus environment	- Select CSC and Contractor with proven experience in multi-storey institutional buildings, façade works, and basement construction in operational campuses. - Verify past safeguards performance (EMP, OHS, accident records). - EMP requirements, reporting formats, and penalties explicitly included in bid documents and contract. - Mandatory EMP & OHS induction prior to mobilization.	SDCMU	MoF	- CSC and Contractor credentials verified and documented. - EMP clauses included in contract. - EMP training conducted before site mobilization.	NQC (Included in SDCMU costs) EMP training cost is included in the EMP implementation cost
20. Labor	Influx of outside labor increases social tension and pressure on campus facilities	- Prioritize hiring of local and regional workers for general construction activities. - Limit non-local/skilled labor to specialized trades only (e.g., façade, lifts). - Maintain labor register with origin and skill category.	Con	MoF, SDCMU-ESFP, PIU	- Workers from outside the project site region represent less than 10% of total workforce	NQC (Included in Con costs)
21. Materials sourcing (environmental damage)	Use of sand, gravel, bricks from illegal river mining or hill cutting	- Procure materials only from suppliers holding valid BSTI certificates and legal extraction permits. - Maintain supplier documentation on site for inspection.	Con	MoF, SDCMU-ESFP, PIU	- BSTI certificates and source declarations filed for all bulk materials. - No complaints or notices related to illegal sourcing.	NQC (Included in Con costs)
22. Materials sourcing (transport emissions)	High GHG emissions and traffic nuisance from long-distance hauling	- Prioritize materials sourced from within Dhaka region where feasible (cement, aggregates, blocks, steel). - Optimize delivery schedules to reduce peak traffic congestion on campus roads.	Con	MoF, SDCMU-ESFP, PIU	- Majority of bulk materials sourced within reasonable haul distance. - Delivery logs show compliance with approved time windows.	NQC (Included in Con costs)
23. Materials Sourcing	Indirect environmental impacts from unsustainable supply chains	- Prefer suppliers with environmental certifications (ISO 14001 or equivalent). - For imported items (lifts, façade systems), require manufacturer environmental declarations where available.	Con	MoF, SDCMU-ESFP, PIU	- Supplier environmental credentials reviewed and recorded. - Compliance noted in procurement files.	NQC (Included in Con costs)
B. CONSTRUCTION PHASE						
(i) BIOPHYSICAL ENVIRONMENT						
24. Surface water	Increased runoff from roof slabs and paved areas during construction; Silt-laden runoff entering campus drains and	- Implement temporary drainage system aligned with permanent drainage layout shown in drawings. - Install silt traps, sediment basins, and geotextile filters at all discharge points from the site.	Con	MoF, SDCMU-ESFP, PIU, CSC	- No visible silt discharge to campus drains or canal. - Silt traps installed and cleaned regularly. - No waterlogging complaints from BUTEX campus users.	BDT 30,000 for tarpaulins; BDT 200,000 for bulk organic material for

Parameter	Potential impacts and/or issues	Mitigation/enhancement measures	Implementing entities	Supervision responsibility	Performance indicators	Estimated cost in BDT
	nearby canal via existing drainage ditch; Localized ponding near building entrances, basement ramp, and connectors; Blockage of campus drainage during monsoon.	- Cover exposed soil and stockpiles before rainfall; suspend earthworks during intense rain where feasible. - Protect basement excavation with perimeter drains and temporary sump pumps with sediment control. - Ensure no direct discharge of untreated runoff to the adjacent drainage ditch/canal.			- Basement excavation remains dry and stable during monsoon events.	temporary soil protection (Included in Con costs)
25. Surface water, groundwater and soils	Overflows during extreme events affecting public areas	- Provide emergency overflow weirs from green roofs/planters to protected routes; route exceedance flows along designated overland pathways away from entries and egress routes	Con	MoF, SDCMU-ESFP, PIU, CSC	- Overflow paths shown on grading plan; exceedance routing modeled for 1-in-25 year event; no exceedance flow through primary entrances	(Included in Con costs)
26. Surface water	Insufficient maintenance access to water assets	- Include safe access (guarded ladders, walkways) to green roofs, planters, and tanks; provide isolation valves and cleanouts at sumps and separators; include O&M notes in drawings	Con	MoF, SDCMU-ESFP, PIU, CSC	- Access details provided for each asset; cleanouts/valves scheduled; O&M notes and inspection frequencies listed	(Included in Con costs)
27. Air quality	Dust from construction works create nuisance and health hazard for residents near work sites and roads	- Implement a regimen of misting all dust-generating surfaces throughout the workday during dry weather - Tightly cover stockpiles of fine materials with tarpaulins whenever they are not in active use to prevent wind erosion - Equip all haul trucks with tightly fitting tarpaulins and enforce their use	Con	MoF, SDCMU-ESFP, PIU, CSC	- Levels of airborne dust are below nuisance level in roadside communities - No significant dust accumulation observed on roadside crops and structures - No complaints from public registered - Ambient air quality at perimeter of work sites and on main road near the EDC site meet the standard indicated in the Air Pollution (control) Rules 2022.	BDT 200,000 for sprayer unit (Included in Con cost)
28. Air quality	Emissions from equipment and vehicles used in construction	- Maintain all motorized equipment used in construction to a high standard - Use only fuel-efficient equipment	Con	MoF, SDCMU-ESFP,	- Absence of black smoke in construction equipment exhaust - No complaints from public	NQC (Included in Con cost)

Parameter	Potential impacts and/or issues	Mitigation/enhancement measures	Implementing entities	Supervision responsibility	Performance indicators	Estimated cost in BDT
	degrade local air quality			PIU, CSC	- Ambient air quality at perimeter of work sites at EDC site meet the standard indicated in the Air Pollution (control) Rules 2022. - Emissions from motorized machinery used in construction should meet the standard indicated in the Air Pollution (control) Rules 2022.	
29. Soil	Loss of topsoil to erosion	- Implement approved Soil Erosion Prevention Plan, including (inter alia): - Protect disturbed soil from rain by keeping exposed areas covered with mulches, fiber mats and other temporary coverings - Arrange work site drainage to prevent concentration of surface runoff in the vicinity of exposed soils - Promptly establish vegetative cover on soil surfaces in locations where construction activity has been completed - Implement approved Site Reinstatement Plan, including (inter alia): - Reserve topsoil and store separately for later use - Promptly prepare soil surfaces for plantings once construction work has been completed in each part of site - Establish vegetative cover in accordance with landscaping plan in detailed site design, Bill of Quantities and Compensatory Tree Planting Plan - Implement a watering and tending regimen to help ensure success of plantings - Monitor progress of vegetation establishment until end of defects period, and implement infill planting as necessary to achieve full coverage	Con	MoF, SDCMU-ESFP, PIU, CSC	- Prescribed soil protection measures effectively implemented at all work sites - Lack of evidence of soil erosion - Vegetative cover promptly established when construction activity complete on each part of work sites	NQC (Included in Con costs specified in relation surface water protection above)
30. Flora and fauna	Damage to trees	- Clearly mark trees that are to be preserved prior to clearing - Establish a fenced buffer around trees that are to be preserved to protect them from damage by equipment, excavation and materials stockpiles	Con	MoF, SDCMU-ESFP, PIU, CSC	- Trees clearly marked prior to site clearing - Fenced buffers established, maintained and observed around preserved trees for duration of works	BDT 50,000 for fencing (Included in Con costs)

Parameter	Potential impacts and/or issues	Mitigation/enhancement measures	Implementing entities	Supervision responsibility	Performance indicators	Estimated cost in BDT
31. Flora and fauna	Aquatic habitat in on-site watercourses degraded	- There is natural water course near the site. The deep ditch adjacent to the site drains toward the main drainage system which is actually a canal. - Establish a 10-m buffer with temporary fencing along any permanent or seasonal watercourses found on site, and enforce a prohibition on any construction-related activity within the buffer for the duration of the works - Deploy silt curtains and temporary sediment traps where runoff from active work areas is directed to creeks	Con	MoF, SDCMU-ESFP, PIU, CSC	- 10-m buffer established with temporary fencing along any permanent or seasonal watercourses on site - Prohibition on construction-related activities within the buffer enforced - Silt curtains and sediment traps deployed as appropriate to limit silt delivery to on-site watercourses	BDT 30,000 (Included in Con costs)
32. Flora and fauna	Loss of existing vegetation and habitat connectivity; Bird–glass collisions on facades and bridges	- Map and retain priority trees/shrubs; design building and circulation to avoid high-value vegetation; provide compensatory planting at a minimum 3:1 ratio using native species; maintain continuous green corridors linking existing roof and new facade/void landscapes. The tree planation plan is already stipulated within the design. - Use bird-safe glazing treatments (fritted/etched patterns meeting 2×4 rule), external shading, and visual markers near vegetated facades; avoid mirror-like glass adjacent to planting	Con	MoF, SDCMU-ESFP, PIU, CSC	- Percent priority trees retained (target ≥80%); compensatory planting ratio achieved (≥3:1); continuous green corridor shown on plans from existing roof to new building green systems; - Bird-friendly glazing specified for all greening-adjacent facades; shading/louvre details included; collision risk assessment completed at design	BDT 10,000 (Included in Con costs)
(ii) SOCIOECONOMIC AND CULTURAL ENVIRONMENT						
33. Acoustic environment	Noise and vibration from earthworks, pile-driving and materials hauling degrade quality of life for local residents	- Conduct work only during daylight hours - Impose and enforce low speed limits on haul trucks through the DU campus roads - Maintain all motorized equipment and haul trucks to a high standard, and inspect exhaust systems regularly	Con	MoF, SDCMU-ESFP, PIU, CSC	- Noise and vibration are below nuisance level for closest educational buildings - No construction work or hauling is conducted between dusk and dawn - No complaints from the public registered - Ambient noise levels outside the work sites meet the standard indicated in the Noise Pollution (control) Rules 2006. - Noise emissions from individual pieces of machinery and vehicles meet the standard indicated in the	NQC (Included in Con costs)

Parameter	Potential impacts and/or issues	Mitigation/enhancement measures	Implementing entities	Supervision responsibility	Performance indicators	Estimated cost in BDT
					Noise Pollution (control) Rules 2006.	
34. Public safety	Elevated risks to pedestrians on approach road and in the site	- Ensure that the construction sites are adequately fenced and security is provided to prevent members of the public from entering the sites - Establish safe, marked routes for staff and facility users to continue to use the BUTEX facilities without having to cross active construction zones - Implement approved Construction Traffic Management Plan during hauling periods, including (inter alia): - Impose and enforce low speed limits on haul trucks through the campus roads	Con	MoF, SDCMU-ESFP, PIU, CSC	- Adequate fencing and security maintained at construction sites - Construction zone is configured to maintain safe access for BUTEX staff during construction works - Construction Traffic Management Plan prepared and observed to be implemented as appropriate - Haul trucks not observed or reported to speed through BUTEX site or elsewhere along the internal campus roads near the work site	NQC (Included in Con costs)
35. Public safety	Construction camps are locus of violence against women and girls	- Give preference to local laborers to avoid the need for, or limit the size of, a construction camp - Implement approved Construction Camp Management Plan, including (inter alia): - Conduct proactive outreach with leaders of nearby communities to educate women and girls about the risks posed by an all-male camp in the neighborhood. - Give resident workers regular training on appropriate behavior in and around the camp - Adopt a zero-tolerance policy around aggression or violence against local women and girls - When women must enter the camp for employment or selling produce, limit their entry to times when resident workers are out at the work site - Prohibit prostitution on the site, and monitor activity in this regard and work with community leaders to address the problem as needed	Con	MoF, SDCMU-ESFP, PIU, CSC	- Lack of reports of worker-involved abuse or harassment - Lack of complaints from public about violence or prostitution at camp - Female access to camp for employment allowed only when workers are out at work sites	NQC (Included in each entity's costs)
36. Public safety	Construction camps serve as source of social conflict, possibly leading to violence	- Implement approved Construction Camp Management Plan, including (inter alia): - Provide regular training and enforcement to minimize bad worker behavior off site, including public drunkenness, sexual harassment, and theft of crops/foods	Con	MoF, SDCMU-ESFP, PIU, CSC	- Lack of complaints from public about behavior of resident workers	NQC (Included in Con costs)

Parameter	Potential impacts and/or issues	Mitigation/enhancement measures	Implementing entities	Supervision responsibility	Performance indicators	Estimated cost in BDT
37. Public health	Construction camps act as vectors for spread of pathogens and disease	- Implement approved Construction Camp Management Plan, including (inter alia): - Install and maintain adequate toilet and septic systems to prevent discharge of raw sewage from camps to local water bodies or fields - Educating resident workers about sexually transmitted diseases and responsible sexual behavior - Work with local community leaders to prohibit prostitution in and around construction camps	Con	MoF, SDCMU-ESFP, PIU, CSC	- At least one working toilet per 10 resident workers installed, with septic treatment - Absence of visual evidence of raw sewage discharge - Lack of reports of prostitution around camp - Lack of concerns expressed by local community leaders about workers' off-site behavior	BDT 200,000 for toilets and septic systems (Included in Con costs)
38. Worker health and safety	Risks to worker health and safety from improper work site practices	- Implement approved Occupational Health and Safety Plan, including (inter alia): - Provide regular safety training for all workers - Provide task-appropriate PPE to all workers and enforce its use - Closely monitor works at all times to ensure strong worker compliance with safety practices	Con	MoF, SDCMU-ESFP, PIU, CSC	- Low incidence of workplace injuries - Workers observed using appropriate PPE	NQC (Included in Con costs)
39. Worker health	Risks to workers from viral illness	- Implement approved Occupational Health and Safety Plan, including (inter alia): - Institute temperature checks (at least daily) for all workers and supervisory personnel on site - Provide each worker with appropriate face mask daily or as needed, and require mask use at all times - Position hand washing and sanitizing stations at canteens and other eating areas, kitchens, and near toilets	Con	MoF, SDCMU-ESFP, PIU, CSC	- Temperature check regimen implemented consistently - Workers supplied with facemasks - Workers consistently use facemasks - Hand washing and sanitizing stations provided in appropriate locations and kept stocked at all times	NQC (Included in Con costs)
40. Worker health and safety	Risks to worker health and safety from poor conditions in construction camps	- Implement approved Occupational Health and Safety Plan, including (inter alia): - Conduct monthly safety audit of camp to identify fire risks, electrocution hazards and other unsafe conditions, and assess adequacy of fire extinguishers and first aid provisions - Institute a regular cleaning and disinfection regimen for camp kitchens, latrines, wash-up areas, eating areas and sleeping sheds - Provide adequate sleeping space for the number of workers to avoid overcrowding and consequent spread of communicable illnesses and infestations	Con	MoF, SDCMU-ESFP, PIU, CSC	- Safety audit results included in monthly progress reports and quarterly monitoring reports - Lack of outbreaks of infectious illnesses (e.g., influenza, pneumonia, tuberculosis) and ailments associated with unsanitary conditions (e.g., dysentery, lice, scabies) - Living conditions meet standards specified in	BDT 100,000 for drinking water procurement or treatment (Included in Con costs)

Parameter	Potential impacts and/or issues	Mitigation/enhancement measures	Implementing entities	Supervision responsibility	Performance indicators	Estimated cost in BDT
		- Provide each worker with a raised sleeping platform with mattress or mat, bedding and mosquito netting - Test drinking water supplied to workers on a quarterly basis to ensure safety - Ensure adequate ventilation and light in all camp structures			Construction Camp Management Plan - Drinking water test results meet standards indicated in the Environment Conservation Rules, 2023	
41. Livelihoods	Damage to property and livelihoods	- Fence perimeter of each work site prior to the start of construction and ensure maintenance of fencing for the duration of works - Prohibit all construction-related activity outside the site fences - Promptly remedy any property damage caused in consultation with the affected landowner(s), even if not formal grievance files	Con	MoF, SDCMU-ESFP, PIU, CSC	- Perimeter of each work site properly fenced prior to the start of construction, and fence maintained for duration of works	NQC (Included in Con cost)
42. Livelihoods	Employment for local people	- Hire mostly or exclusively local workers on construction sites	Con	MoF, SDCMU-ESFP, PIU, CSC	- Workers from outside project region represent less than 10% of total workforce on site	NQC (Included in Con cost)
43. Physical cultural resources	Damage to cultural heritage due to inappropriate treatment of unearthed artifacts	- Train all workers and site managers in the use of the chance find procedure specified in the CEMP	Con	MoF, SDCMU-ESFP, PIU, CSC	- Workers are aware of the chance find procedure	NQC (Included in Con cost)
(iii) WASTE MANAGEMENT						
44. Construction waste	Pollution from improper management of solid waste generated at work sites and construction camp	- Implement all provisions in the Waste Management Plan embedded in CEMP, including (inter alia): - Provide waste receptacles on the work sites and collect their contents daily or weekly as needed - Recycle all recyclables through local providers of this service - Compost organic waste generated by construction camp kitchens - Dispose of non-recyclable and non-organic waste based on locally available and approved disposal options	Con	MoF, SDCMU-ESFP, PIU, CSC	- All classes of waste managed in accordance with Waste Management Plan	NQC (included in Con costs)
45. Waste oils	Water pollution from waste oils and other fluids generated in	- Recycle waste oils through a reputable business providing this service, as identified in the Waste Management Plan embedded in the CEMP	Con	MoF, SDCMU-	- No evidence of waste oil dumping or burning	NQC (Included in Con costs)

Parameter	Potential impacts and/or issues	Mitigation/enhancement measures	Implementing entities	Supervision responsibility	Performance indicators	Estimated cost in BDT
	maintenance yards			ESFP, PIU, CSC	- Documentation of transfers to identified service provider available	
C. OPERATION PHASE						
(i) BIOPHYSICAL ENVIRONMENT						
46. Drinking water quality	Microbiological contamination in potable water	- Maintain multi-barrier treatment at point of entry: cartridge filtration and UV or chlorination; implement monthly microbial testing (E. coli, total coliforms) and immediate corrective actions; maintain positive residual where chlorination is used	BUTEX authority	BUTEX authority	- Microbial tests compliant 100% of months; corrective action closed within 7 days; disinfectant residual within target range at distal taps	BUTEX operation cost
(ii) SOCIOECONOMIC AND CULTURAL ENVIRONMENT						
47. Community Health and safety	Access to safe drinking water on all occupied floors	- Provide clearly labeled potable fountains and bottle fillers near lobbies, classrooms, labs, café, auditorium, and rooftop learning areas; ensure universal accessibility and hygienic design	BUTEX	BUTEX	- Functional, labeled stations on every occupied floor; accessibility compliance; station uptime ≥ 98% per quarter	NQC (Included in SDCMU and BUTEX operating costs)
48. Gender-Based Violence and Sexual Exploitation, Abuse, and Harassment (GBV/SEA-SH)	- Risk of harassment/abuse involving construction workers and students, faculty, or staff due to workforce influx on active campus - Unsupervised interaction at site boundaries, access points, shared pathways - Power imbalance between workers/supervisors and vulnerable individuals - Inadequate site lighting/fencing enabling unsafe conditions - Underreporting	- Mandatory GBV/SEA-SH awareness training and signed Code of Conduct for all workers/supervisors prior to mobilization, with periodic refreshers - Continuous site hoarding/fencing, controlled access points, adequate perimeter lighting - Physical separation of construction zones from dormitories, classrooms, common areas - Establish confidential, survivor-centered GRM distinct from general grievances, with dedicated (preferably female) focal point - Prohibit hiring of workers with documented GBV/SEA-SH history - Prioritize local labor sourcing to reduce construction-camp risks - Coordinate with BUTEX's existing sexual harassment complaint committee to avoid parallel/conflicting reporting structures - Immediate corrective action and referral to counseling/medical/legal support upon substantiated complaint	BUTEX	BUTEX	- % of workers trained and Code of Conduct signed prior to mobilization (target: 100%) - Functional GBV/SEA-SH GRM established and publicized before construction start (Y/N) - Number of GBV/SEA-SH complaints received, logged, and resolved within defined timeframe - Site fencing/lighting adequacy confirmed via periodic safeguards inspection - Zero tolerance breaches (workers with prior offenses hired: target 0) - Coordination meeting held with BUTEX complaint committee (Y/N, frequency)	NQC (Included in SDCMU and BUTEX operating costs)

Parameter	Potential impacts and/or issues	Mitigation/enhancement measures	Implementing entities	Supervision responsibility	Performance indicators	Estimated cost in BDT
	due to stigma or lack of trusted complaint channels					
(iii) WASTE MANAGEMENT						
49. Solid waste	Mixed waste and high contamination in recyclables	- **Post construction cleanup:** Remove all construction debris, surplus materials, temporary structures (hoarding, site offices, worker facilities), and equipment from the site and surrounding campus areas immediately upon completion of works. - Restore disturbed surfaces, including paved areas, green/landscaped zones, and campus roads/footpaths, to pre-construction or better condition, including reinstatement of topsoil and planting in designated green areas. - Decommission and properly dispose of or recycle temporary utilities (drainage bypasses, silt fencing, concrete washout pits), ensuring no residual contamination (e.g., cement wash-water residue, fuel/oil spills) remains on site. - Conduct a joint post-construction inspection with the CSC, PIU safeguards focal person, and BUTEX representatives to verify site restoration and obtain formal sign-off/handover before demobilization. - Clean and clear all campus drains, khals, and access roads of construction-related sediment, spoil, or debris to restore pre-construction drainage functionality. - Establish three/four-stream stations (recyclables, organics, landfill, e-waste where applicable) with paired bins, standardized color-coding, and pictorial signage at all floors, cafeterias, and lobbies	BUTEX	BUTEX	- Diversion rate ≥50–60% by weight; contamination in recycling ≤10%; bins and signage present at all designated locations	NQC (Included in BUTEX operating costs)
50. Laboratory Waste	Uncontrolled hazardous laboratory waste generation and improper segregation, storage, or disposal of chemical/biological	- Establish segregated collection stations at source in each laboratory (dyeing/printing/finishing, analytical, central research, textile testing labs) with color-coded, clearly labeled containers for hazardous liquid waste, hazardous solid waste, and non-hazardous laboratory waste - Provide secondary containment for hazardous liquid waste storage areas and designate a centralized, secured temporary hazardous waste storage room	BUTEX	BUTEX	- Laboratory waste segregation stations installed and functional in all designated laboratories - Hazardous waste storage area with secondary containment operational; access restricted to authorized personnel	NQC (Included in BUTEX operating costs)

Parameter	Potential impacts and/or issues	Mitigation/enhancement measures	Implementing entities	Supervision responsibility	Performance indicators	Estimated cost in BDT
	waste from EDC laboratories	with restricted access, spill kits, and appropriate ventilation - Install pretreatment/neutralization unit for hazardous liquid effluent prior to discharge to meet Environment Conservation Rules 2023 Schedule 10 (Inland Surface Water) standards - Engage licensed hazardous waste contractor for off-site transport and disposal of segregated hazardous solid waste, with signed waste transfer manifests retained for each shipment - - Provide PPE and annual refresher training to laboratory technicians and maintenance staff on waste handling protocols and Emergency Response Plan activation			- Effluent discharge quality (pH, BOD5, COD, heavy metals as applicable) meets Environment Conservation Rules 2023 Schedule 10 standards - Waste transfer manifests on file for all hazardous waste shipments; annual waste audit conducted and reported - - 100% of laboratory staff trained annually on waste handling and emergency response	

D. Environmental Monitoring and Reporting

293. The purpose of environmental monitoring is to ensure that the EMP is fully and competently implemented across all phases of the project's development, and to provide a basis for appropriate and timely corrective action when it is found not to be. The environmental monitoring process should be understood not only as a means of supervision and enforcement, but also as a vehicle for organizational learning and progress towards mainstream international best practice in construction site and facility management. Effective monitoring can also be a vital tool in forestalling conflict with the communities most likely to suffer the consequences of negative environmental impacts, as problems can be identified and corrected in a timely manner, before they grow to nuisance or dangerous levels.

294. Environmental monitoring consists of assessing both the degree to which Contractors and facility operators are fulfilling their responsibilities to implement measures specified in the EMP to manage impacts (compliance monitoring), and the degree to which their impact management efforts are successful in preventing harmful environmental conditions from arising (effects monitoring). Compliance monitoring typically makes use of checklists to confirm or disconfirm that prescribed measures are being properly implemented, while effects monitoring involves quantitative and/or qualitative sampling at designated locations. Both types of monitoring need to be conducted on a regular and consistent basis, to ensure comparability of results across monitoring periods. Monitoring should begin before site clearing, so an environmental baseline (i.e., pre-project conditions) can be established for key environmental parameters.

295. Monitoring parameters for each prescribed mitigation and enhancement measure are identified in Table IX-3 above. Specific monitoring responsibilities, including the monitoring and reporting timetable for each, are detailed in Table IX-4.

Table IX-4 Environmental Monitoring Plan

KEYS: ADB: Asian Development Bank; CSC: Construction Supervision Consultant; Con: Contractor; DOE: Department of Environment; EAs: Executing Agencies; EHSO: Environment, Health and Safety Officer; ESFP: Environmental Safeguards Focal Person; NQC: No Quantifiable Cost; PIU: Project Implementation Unit; SOU: Safeguards Oversight Unit; TMED: Technical and Madrasa Education Division; BUTEX: Bangladesh University of Textile Engineering, EMP: Environmental Management Plan, EMoP: Environmental Monitoring Plan; EDC: Executive Development Center

Parameter type	Prescribed measures	Monitoring entity	Monitoring parameters	When to monitor	Estimated monitoring cost in BDT
A. PRE-CONSTRUCTION PHASE					
(i) IMPLEMENTATION READINESS					
1. Environmental baseline	- Collect and analyze samples for key environmental parameters to establish a pre-project environmental baseline for development site	ESFP SDCMU ESFP BUTEX	- Ambient air quality ($PM_{2.5}$, PM_{10}, SO_2, CO, NO_2); compare to the Air Pollution (control) Rules 2022 (minimum 8 hr sampling period) - Adjacent surface waters (pH, BOD_5, COD, DO, SS, total coliform, Total P, Total N, turbidity); compare to the Environment Conservation Rules, 2023 - Groundwater in wells on site or nearby (pH, TDS, EC, DO, BOD_5, COD, Chloride, SS, As, Fe, Total-N, Total-P, Total coliform, turbidity, temperature); compare to the Environment Conservation Rules, 2023 - Ambient noise (dBa daytime, dBa night); compare to the Noise Pollution (control) Rules 2006	One sample prior to start of site clearing Sampling locations: to be set by the environmental specialist employed by CSC and TMED SOU	See Table IX-8 for details.
2. IEE and EMP update	- Review IEE and EMP to ensure any post-approval changes are properly accounted for and addressed, by addition of mitigation measures if necessary	ESFP SDCMU	- IEE and EMP confirmed still fully applicable - New measures added to EMP if needed to cover any changes in alignment, design or local conditions	Once before start of procurement	NQC (Included in SDCMU budget)
3. Verification of environmental clearances	- Confirm Site Clearance Certificate (SCC) and Environmental Clearance Certificate (ECC) have been granted, and that any conditions imposed by DOE on approval have been reflected in EMP and EMoP, as well as CEMP as applicable	ESFP SDCMU	- SCC and ECC granted. - New measures added to EMP, EMoP and CEMP if needed to meet any condition of approval specified by DOE	Once before start of procurement	NQC (Included in SDCMU budget)
4. CEMP verification	- Review CEMP to ensure all primary Contractor responsibilities are fully reflected, including monitoring and reporting	CSC	- Any necessary changes requested and made by Contractor. - CEMP confirmed adequate by reviewers	Once before start of construction	NQC (Included in CSC amount)
5.Specialized plans verification	- Confirm that the following specialized plans have been prepared by the Contractor: - site-specific Construction Camp Management Plan(s)	CSC	- All required specialized plans prepared to adequate standard and approved by relevant authority (as required in some cases)	Once before start of construction	NQC (Included in CSC amount)

Parameter type	Prescribed measures	Monitoring entity	Monitoring parameters	When to monitor	Estimated monitoring cost in BDT
	- site-specific Waste Management Plans (embedded within CEMP) - site-specific Emergency Response Plans (embedded within CEMP) - Compensatory Tree Planting Plan - Construction Traffic Management Plan - Asbestos-Containing Materials Removal and Disposal Plan - Soil Erosion Prevention Plan - Site Reinstatement Plan - Occupational Health and Safety Plan (including COVID-19 measures stipulated by ADB and Government of Bangladesh Guidance for Social and Institutional Containment and Prevention) - Laboratory Waste Management Plan				
6. Grievance Redress Mechanisms	- Confirm that a central GRM and workers' GRM have been established and publicized	ESFP SDCMU	- Central GRM established and publicized - Workers' GRM established and explained to workers before the start of construction	Once before start of construction	NQC (Included in PIU budget)
7. Acoustic environment	- Convene a workshop with participation of people living and operating businesses along polytechnic Road, local ward Council representatives, RHD/LGED, police and other government agencies to discuss feasibility of limiting vehicle horn use in the NATI zone and formulate action as appropriate	ESFP SDCMU	- Workshop convened and action plan formulated if consensus for action found	Once before end of design phase, quarterly thereafter until action confirmed	NQC (Included in PIU budget)
8. Induced development and cumulative impacts	- Arrange multi-stakeholder workshop at Police Plaza Road with participation of local, upazila and district governments, all relevant government agencies, and concerned business interests (from gravel, trading, agricultural and tourism sectors, at a minimum) to initiate a broad-based public dialogue regarding the livelihoods of the local people and the people living near the site.	ESFP SDCMU	- Multi-stakeholder workshop with suitable broad participation convened by MoF through SDCMU	Once before end of design phase, quarterly thereafter until action confirmed	NQC (Included in PIU budget)
9. EMP training	- Without proper EMP implementation training, EMP monitoring might be delayed or hampered	- Confirm that EMP implantation training has been arranged before commencement of construction. - Involve contractor's high	- SDCMU/CSC	EMP training report	NQC (Included in PIU budget)

Parameter type	Prescribed measures	Monitoring entity	Monitoring parameters	When to monitor	Estimated monitoring cost in BDT
		officials/management part, EHS specialist, construction project managers and workforce overseer in the EMP training ; Quarterly Refreshers training on EMP implementation			
(ii) DESIGN					
10. Climate change mitigation	- Integrate GHG-limiting measures into facility designs, including: - substitute other materials for concrete where feasible - use low-carbon concrete as much as possible - maximize use of building materials available locally - integrate photovoltaic generation into the electrical plan - specify only high-efficiency electrical and mechanical equipment - specify most fuel-efficient backup generator available - maximize cross-ventilation by use of courtyards, openable windows and favorable building orientation - incorporate hollow wall structures where feasible - Use overhangs above large windows to prevent excessive solar penetration - Prioritize shade in the landscaping plan, with plentiful wide-crowned shade trees on all parts of site - Maximize interior natural light by using favorable building orientation and courtyards - Specify water-saving toilets, faucets and showerheads - Design dedicated plumbing system for drinking and cooking water - Aim to meet all water heating needs with solar heaters - Specify high-intensity, full-time lighting only where strictly necessary - Specify solar-powered lighting for outdoor applications	SOU-SDCMU, ESFP-SDCMU, ESFP-BUTEX	- All feasible GHG-reduction design measures incorporated in facility designs - Soft landscaping plan (covering all site areas not occupied by structures, roadways or walkways, and including ample shade trees and dense ground cover) included in detailed site design, with plantings specified in Bill of Quantities	Once before approval of detailed designs	NQC (included in SDCMU budget)

Parameter type	Prescribed measures	Monitoring entity	Monitoring parameters	When to monitor	Estimated monitoring cost in BDT
	- Base landscape plan around drought-tolerant perennial native species - Design site layout and inspection process to minimize the length of time vehicles have their engines running during the border-crossing process - Incorporate green roofs wherever roof area is not needed for solar panels and solar water heaters - Maximize carbon sequestration potential, micro-climatic cooling and runoff retention by specifying a landscaping plan covering all site areas not occupied by structures, roadways or walkways, including ample shade trees (especially near buildings) and dense ground cover in open areas				
11. Climate change adaptation	- Design facilities so that critical components (including laboratory, backup generator and fuel tanks) are well above maximum flood level foreseen under climate change projections specified in Climate Risk and Adaptation Assessment (CRA) report and detailed hydrological study - Incorporate temperature-moderating features in EDC facility designs, including: - green roofs where feasible - maximize use of wide-crowned shade trees in site landscaping plans, including around buildings and parking area medians - maximize cross-ventilation by use of courtyards, openable windows and favorable building orientation	SOU-SDCMU, ESFP-SDCMU, ESFP-BUTEX	- All critical facility components above maximum expected flood level - All feasible temperature-moderating features incorporated in facility designs	Once before approval of detailed designs	NQC (included in SDCMU budget)
12. Flora and fauna	- Avoid removal of trees to the greatest extent possible - Incorporate existing trees as site features whenever possible, and include them in site designs - When trees must be removed, compensatory trees should be planned elsewhere on site and marked in the design drawings, and included in the Bill of Quantities, in accordance with	SOU-SDCMU, ESFP-SDCMU, ESFP-BUTEX	- Existing trees preserved in site designs to the greatest extent feasible - Compensatory trees included in design drawings and Bill of Quantities, in accordance with Compensatory Tree Planting Plan	Once before approval of detailed designs	NQC (included in SDCMU budget)

Parameter type	Prescribed measures	Monitoring entity	Monitoring parameters	When to monitor	Estimated monitoring cost in BDT
	approved Compensatory Tree Planting Plan				
13. Groundwater resources	- Maximize opportunities to limit water consumption and increase groundwater recharge, including adoption of: - rain capture on all roofs and use of stored water for non-potable uses in and around facilities - high-efficiency faucets and toilets throughout the facilities - plant species with low water needs in site landscaping plans - stormwater infiltration swales for all runoff from paved and impervious surfaces (objective: zero site runoff)	SOU-SDCMU, ESFP-SDCMU, ESFP-BUTEX	- All feasible and applicable water conservation measures incorporated in detailed designs for NATI facilities	Once before approval of detailed designs	NQC (included in SDCMU budget)
14. Public health	- Design EDC building internal layout to maintain adequate space between individual users and prevent formation of long lines in indoor spaces - Design EDC building ventilation system to maximize turnover of indoor air	SOU-SDCMU, ESFP-SDCMU, ESFP-BUTEX	- EDC building design enables social distancing - EDC building ventilation system designed to maximize turnover of indoor air	Once before approval of detailed designs	NQC (included in SDCMU budget)
15. Water quality	- Include designated storage with secondary containment for noxious substances (fuels, lubricants, paints, etc.) used in BUTEX operations in detailed design - Slightly raise surface of site minerals storage area above level of rest of site to prevent runoff from other site areas from washing through stockpiles - Include sediment traps and porous drainage channels in final drainage design for minerals storage area, to limit discharge of sediments	SOU-SDCMU, ESFP-SDCMU, ESFP-BUTEX	- Storage spaces with secondary containment for noxious substances included in detailed designs for EDC - Surface of EDC site's minerals storage area slightly raised above rest of site in detailed design - Sediment traps and porous drainage channels included in detailed design of site minerals storage area	Once before approval of detailed designs	NQC (included in SDCMU budget)
16. Air quality	- Include water supply to minerals storage area, with hose spigots in several locations around the perimeter to enable use of mobile misting apparatus	SOU-SDCMU, ESFP-SDCMU, ESFP-BUTEX	- Detailed design includes water supply to minerals storage area, with multiple hose spigots spaced around perimeter	Once before approval of detailed designs	NQC (included in SDCMU budget)
17. Occupational health and safety	- Design canopies over areas used by heavy laboratory machineries designed with extra headroom and good cross ventilation or fans to evacuate emissions efficiently	SOU-SDCMU, ESFP-SDCMU, ESFP-BUTEX	- Canopies over areas used by heavy laboratory machineries designed with extra headroom and good cross ventilation or fans to evacuate emissions efficiently	Once before approval of detailed designs	NQC (included in SDCMU budget)
18. Occupational health and safety	- Design interior layout of the EDC building to maximize space between users and prevent the formation of long lines in indoor spaces.	SOU-SDCMU, ESFP-SDCMU, ESFP-BUTEX	- Internal layout of the EDC building is designed to maximize space between users and prevent the formation of long lines in indoor spaces		

Parameter type	Prescribed measures	Monitoring entity	Monitoring parameters	When to monitor	Estimated monitoring cost in BDT
	- Design NATI building ventilation system for maximum feasible turnover of indoor air		- EDC building ventilation system is designed for maximum feasible turnover of indoor air		
19. Occupational health and safety	- Engage qualified laboratory specialist to contribute to design of laboratory and associated structures, as well as preparation of operation protocols including waste management plans, to adhere to international laboratory design standards and best practices	SOU-SDCMU, ESFP-SDCMU, ESFP-BUTEX	- Suitable laboratory design specialist engaged to ensure design and operations of laboratory adhere to international laboratory design and operation standards and best practice	At beginning of detailed design work	NQC (included in SDCMU budget)
20. Waste management	- Anticipate waste streams and incorporate design features to collect, sort and safely dispose of each class of waste - Specify segregated collection bins in strategic indoor and outdoor locations where wastes are generated - Include waste storage and sorting areas in facility designs - Incorporate easy access for waste and recyclables collection vehicles - Designate outdoor space for thermophilic composting of organic waste from kitchens and canteens - Design laboratory for appropriate segregation of hazardous and non-hazardous waste streams - Engage qualified laboratory specialist to contribute to design of laboratory and associated structures, as well as preparation of operation protocols including waste management plans, to adhere to international laboratory design standards and best practices	SOU-SDCMU, ESFP-SDCMU, ESFP-BUTEX	- Facility designs include spaces and features for waste management, including collection, sorting, composting, storage and out-shipment - Suitable laboratory design specialist engaged to ensure design and operations of laboratory adhere to international laboratory design and operation standards and best practice laboratory - Laboratory design provides for at-source segregation of hazardous liquid and solid wastes	Once before approval of detailed designs	NQC (included in SDCMU budget)
(ii) PROCUREMENT					
21. Selection of Contractor	- Prioritize selection of Contractor with strong compliance track record, as verified by references from previous CSCs - Select only Contractors registered with MOLE	SOU-SDCMU, ESFP-SDCMU, ESFP-BUTEX	- Selected Contractor has verified track record of good performance on safeguards compliance	Once during procurement	NQC (included in SDCMU budget)
22. Selection of Contractor	- Require prospective Contractors to provide information on the age, condition and fuel-efficiency of their machinery and vehicle fleets in their bids, and consider this in the selection process	SOU-SDCMU, ESFP-SDCMU, ESFP-BUTEX	- Detailed machinery and fleet information required in bids - Emissions potential of fleets considered in Contractor selection - Provision included in contract giving the employer the right to require removal of	Once during procurement	NQC (included in SDCMU budget)

Parameter type	Prescribed measures	Monitoring entity	Monitoring parameters	When to monitor	Estimated monitoring cost in BDT
	- Include provision in contract giving the employer the right to require removal of equipment and vehicles it deems to be unacceptably polluting from work sites at any time during construction, even if these are the property of sub-Contractors		equipment and vehicles it deems to be unacceptably polluting from work sites at any time during construction, even if these are the property of sub-Contractors		
23. Labor	- Hire exclusively or mostly local workers	SOU-SDCMU, ESFP-SDCMU, ESFP-BUTEX	- Workers from Chattagram and around Chattagram given first priority in hiring for construction jobs	Once prior to start of construction	NQC (included in SDCMU budget)
24. Materials sourcing	- Obtain valid Certificate of BSTI from suppliers of bulk materials	SOU-SDCMU, ESFP-SDCMU, ESFP-BUTEX	- Certificate of BSTI obtained and filed for each purchase of bulk materials	Prior to approval of each purchase order	NQC (included in SDCMU budget)
25. Materials sourcing	- Prioritize bulk materials suppliers using less distant sources	SOU-SDCMU, ESFP-SDCMU, ESFP-BUEX	- Materials sourced from within reasonable distance	Prior to approval of each purchase order	NQC (included in SDCMU budget)
26. Materials Sourcing	- Select suppliers with strong green credentials (verified by review of certifications received)	SOU-SDCMU, ESFP-SDCMU, ESFP-BUTEX	- International suppliers of materials have favorable environmental certifications	Prior to approval of each purchase order	NQC (included in SDCMU budget)
B. CONSTRUCTION PHASE					
(i) BIOPHYSICAL ENVIRONMENT					
27. Surface water	- Implement approved Soil Erosion Prevention Plan, including (inter alia): - Protect disturbed soil from rain by keeping exposed areas covered with mulches, fiber mats and other temporary coverings - Keep all stockpiles of erodible materials covered with tarpaulins whenever they are not in active use - Arrange work site drainage to prevent concentration of surface runoff in the vicinity of exposed soils and materials stockpiles - Install and regularly maintain sediment traps in site runoff channels - Promptly reinstate disturbed ground surfaces and establish vegetative cover in locations where construction activity has been completed - Deploy silt curtains and sediment traps when earthworks are carried out near ponds and other standing water	EHSO CSC Contractor	- Prescribed soil protection measures effectively implemented at all work sites in accordance with approved Soil Erosion Prevention Plan - Daily inspection of the existing drainage system at NATI and other drainage channels constructed during construction and take cleaning actions when necessary. - Sediment traps installed in appropriate places, and maintained properly - Lack of evidence of elevated turbidity in water draining to adjacent water bodies - Vegetative cover promptly established when construction activity complete on each part of work sites - Silt curtains properly deployed where appropriate - Adjacent surface water quality (pH, BOD_5, COD, DO, SS, total coliform, Total P, Total N, turbidity) meets standard in the Environment Conservation Rules, 2023	Monthly (soil protection measures) for duration of construction Daily inspections for drainage congestion Quarterly surface water quality monitoring by EHSO at locations dictated by work activity	NQC (included in SDCMU budget) For Surface water quality: BDT 30,000 per sample, Total 8 samples over two years = 8 x BDT 30,000 = BDT 240,000

Parameter type	Prescribed measures	Monitoring entity	Monitoring parameters	When to monitor	Estimated monitoring cost in BDT
	- During construction wastewater and sediment laden water from construction site may clog the existing drainage which are already malfunctioning.				
28. Surface water, groundwater and soils	- Keep all motorized equipment in good repair - Maintain a regiment of systematic daily checks to detect leaks, following up with prompt repair as needed - Strictly require use of drip mats and pans during refueling and servicing to catch spills and drips - Store fuels and other noxious fluids within roofed, rain-exclusive containment structures with capacity at least 115% of the volume of the largest container stored, constructed only in locations with zero probability of flooding during heavy rains - Provide training in spill prevention and spill response to all workers involved in refueling or equipment servicing	EHSO CSC Contractor	- Fuels, lubricants and other noxious fluids stored in appropriate structure - Lack of evidence of leaks from construction equipment - Lack of oil patches on soil surface - Lack of oily sheen on site runoff water	Monthly for duration of construction	NQC (included in SDCMU budget)
29. Surface water	- Install an adequate number of toilets to accommodate all workers, and septic systems of sufficient capacity for the expected effluent volume, in accordance with Construction Camp Management Plan	EHSO CSC Contractor	- At least one working toilet per 10 resident workers installed - Absence of visual evidence of enrichment	Once at beginning of construction, and monthly for duration of construction	NQC (included in SDCMU budget + Contractor costs)
30. Air quality	- Implement a regimen of misting all dust-generating surfaces throughout the work day during dry weather - Tightly cover stockpiles of fine materials with tarpaulins whenever they are not in active use to prevent wind erosion - Equip all haul trucks with tightly-fitting tarpaulins and enforce their use	EHSO CSC Contractor	- Levels of airborne dust are below nuisance level in roadside communities - No significant dust accumulation observed on roadside crops and structures - No complaints from public registered - Ambient air quality ($PM_{2.5}$, PM_{10}, SO_2, CO, NO_2) meets standards indicated in the Air Pollution (control) Rules 2022.	Weekly for duration of construction (observation) (Quantitative measurement quarterly by EHSO at locations dictated by work activity	NQC (EMP cost stipulated in Table IX-8)
31. Air quality	- Maintain all motorized equipment used in construction to a high standard - Use only fuel-efficient equipment	EHSO CSC Contractor	- Absence of black smoke in construction equipment exhaust - No complaints from public	Weekly for duration of construction (Quantitative measurement	NQC (observation)

Parameter type	Prescribed measures	Monitoring entity	Monitoring parameters	When to monitor	Estimated monitoring cost in BDT
				quarterly by EHSO)	
32. Soil	- Implement approved Soil Erosion Prevention Plan, including (inter alia): - Protect disturbed soil from rain by keeping exposed areas covered with mulches, fiber mats and other temporary coverings - Arrange work site drainage to prevent concentration of surface runoff in the vicinity of exposed soils - Promptly establish vegetative cover on soil surfaces in locations where construction activity has been completed - Implement approved Site Reinstatement Plan, including (inter alia): - Reserve topsoil and store separately for later use - Promptly prepare soil surfaces for plantings once construction work has been completed in each part of site - Establish vegetative cover in accordance with landscaping plan in detailed site design, Bill of Quantities and Compensatory Tree Planting Plan - Implement a watering and tending regimen to help ensure success of plantings - Monitor progress of vegetation establishment until end of defects period, and implement infill planting as necessary to achieve full coverage	EHSO CSC Contractor	- Prescribed soil protection measures effectively implemented at all work sites, in accordance with Soil erosion Prevention Plan - Lack of evidence of soil erosion - Vegetative cover promptly established when construction activity complete on each part of work sites	Weekly for duration of construction	NQC (Method: visual inspection)
33. Flora and fauna	- Clearly mark trees that are to be preserved prior to clearing - Establish a fenced buffer around trees that are to be preserved to protect them from damage by equipment, excavation and materials stockpiles	EHSO CSC Contractor	- Trees clearly marked prior to site clearing - Fenced buffers established, maintained and observed around preserved trees for duration of works	Once before site clearing, and monthly for duration of construction	NQC (included in SDCMU, CSC, and Contractor costs)
34. Flora and fauna	- Establish a 10-m buffer with temporary fencing along any permanent or seasonal watercourses found on site, and enforce a prohibition on any construction-related activity within the buffer for the duration of the works - Deploy silt curtains and temporary sediment traps where runoff from active work areas is directed to creeks	EHSO CSC Contractor	- 10-m buffer established with temporary fencing along any permanent or seasonal watercourses on site - Prohibition on construction-related activities within the buffer enforced - Silt curtains and sediment traps deployed as appropriate to limit silt delivery to on-site watercourses	Weekly for duration of construction	NQC (included in SDCMU, CSC, and Contractor costs)

Parameter type	Prescribed measures	Monitoring entity	Monitoring parameters	When to monitor	Estimated monitoring cost in BDT
35. Flora and fauna	- Implement approved Compensatory Tree Planting Plan as soon as schedule of works permits	EHSO CSC Contractor	- Compensatory trees planted and tended in conformance with the approved Compensatory Tree Planting Plan - Planted trees healthy and seem assured of long-term survival	Twice during final 3 months of construction phase	NQC (included in SDCMU budget)
(ii) SOCIOECONOMIC AND CULTURAL ENVIRONMENT					
36. Acoustic environment	- Conduct work only during daylight hours - Impose and enforce low speed limits on haul trucks through the roads nearby the site - Maintain all motorized equipment and haul trucks to a high standard, and inspect exhaust systems regularly	EHSO CSC Contractor	- Noise and vibration are below nuisance level for local residents and roadside small businesses - No construction work or hauling is conducted between dusk and dawn - No complaints from the public registered - Noise levels at roadside around the site meets standard indicated in the Noise Pollution (control) Rules 2006 (during heavy haul periods)	Weekly for duration of construction (observation) (Quantitative measurement by EHSO only during heavy haul periods)	NQC (observation) For quantitative sampling: Included in Contractor cost as EMP cost provided in Table IX-8
37. Public safety	- Ensure that the construction sites are adequately fenced and security is provided to prevent members of the public from entering the sites - Establish safe, marked routes for staff and facility users to continue to use the EDC facilities without having to cross active construction zones - Impose and enforce low speed limits on haul trucks through roads near the site area - Prepare Construction Traffic Management Plan, and implement as appropriate during hauling periods (Contractor)	EHSO CSC Contractor	- Adequate fencing and security maintained at construction site. - Construction zone is configured to maintain safe access for BUTEX staff. - Construction Traffic Management Plan prepared and observed to be implemented as appropriate. - Haul trucks not observed or reported to speed through the nearby roads of the site	Weekly for duration of construction	NQC (included in SDCMU, CSC, Contractor costs)
38. Public safety	- Give preference to local laborers to avoid the need for, or limit the size of, a construction camp - Conduct proactive outreach with leaders of nearby communities to educate women and girls about the risks posed by an all-male camp in the neighborhood - Give resident workers regular training on appropriate behavior in and around the camp - Adopt a zero-tolerance policy around aggression or violence against local women and girls	EHSO CSC Contractor	- Lack of reports of worker-involved abuse or harassment - Lack of complaints from public about violence or prostitution at camp - Female access to camp for employment allowed only when workers are out at work sites - Construction Camp Management Plan implemented as approved	Monthly for duration of construction	NQC (included in SDCMU, CSC, Contractor costs)

Parameter type	Prescribed measures	Monitoring entity	Monitoring parameters	When to monitor	Estimated monitoring cost in BDT
	- When women must enter the camp for employment or selling produce, limit their entry to times when resident workers are out at the work site - Prohibit prostitution on the site, and monitor activity in this regard and work with community leaders to address the problem as needed				
39. Public safety	- Provide regular training and enforcement to minimize bad worker behavior off site, including public drunkenness, sexual harassment, and theft of crops	EHSO CSC Contractor	- Construction Camp Management Plan implemented as approved - Lack of complaints from public about behavior of resident workers	Monthly for duration of construction	NQC (included in SDCMU, CSC, Contractor costs)
40. Public health	- Install and maintain adequate toilet and septic systems to prevent discharge of raw sewage from camps to local water bodies or fields - Educate resident workers about sexually transmitted diseases and responsible sexual behavior - Work with local community leaders to prohibit prostitution in and around construction camps	EHSO CSC Contractor	- Construction Camp Management Plan implemented as approved - At least one working toilet per 10 resident workers installed, with septic treatment - Absence of visual evidence of raw sewage discharge - Lack of reports of prostitution around camp - Lack of concerns expressed by local community leaders about workers' off-site behavior	Once at start of construction (toilets) Monthly for duration of construction (other items)	NQC (included in SDCMU, CSC, Contractor costs)
41. Worker health and safety	- Implement approved Occupational Health and Safety Plan - Provide regular safety training for all workers - Provide task-appropriate PPE to all workers and enforce its use - Closely monitor works at all times to ensure strong worker compliance with safety practices	EHSO CSC Contractor	- Low incidence of workplace injuries - Workers observed using appropriate PPE - All aspects of Occupational Health and Safety Plan implemented as approved	Weekly for duration of construction	NQC (included in SDCMU, CSC, Contractor costs)
42. Worker health	- Implement approved Occupational Health and Safety Plan - Institute temperature checks (at least daily) for all workers and supervisory personnel on site - Provide each worker with an appropriate face mask daily or as needed and require mask use at all times. - Position hand washing and sanitizing stations at canteens and other eating areas, kitchens, and near toilets	EHSO CSC Contractor	- Temperature check regimen implemented consistently. - Workers supplied facemasks. - Workers consistently use facemasks. - Hand washing and sanitizing stations provided in appropriate locations and kept stocked at all times. - All aspects of Occupational Health and Safety Plan implemented as approved	Weekly for duration of construction	NQC (included in SDCMU, CSC, Contractor costs)
43. Worker health and safety	- Implement approved Construction Camp Management Plan	EHSO CSC Contractor	- Safety audit results included in monthly progress reports and quarterly monitoring reports	Monthly for duration of	NQC (observation)

Parameter type	Prescribed measures	Monitoring entity	Monitoring parameters	When to monitor	Estimated monitoring cost in BDT
	- Conduct monthly safety audit of camp to identify fire risks, electrocution hazards and other unsafe conditions, and assess adequacy of fire extinguishers and first aid provisions - Institute a regular cleaning and disinfection regimen for camp kitchens, latrines, wash-up areas, eating areas and sleeping sheds - Provide adequate sleeping space with good cross-ventilation to avoid overcrowding and consequent spread of communicable illnesses and infestations (at least 4m^2 per worker) - Provide each worker with a raised sleeping platform with mattress or mat, bedding and mosquito netting - Ensure that each sleeping space has at least two working exits that remain functional at all times - Provide unlimited drinking water that meets the standards indicated in the Environment Conservation Rules, 2023 - Provide indoor eating space separate from sleeping areas; - Provide kitchens with off-floor food storage, raised working surfaces of a material that can be easily sanitized, and a ready supply of clean water; - Provide toilet facilities with at least one functional toilet (protected from the elements and affording full visual privacy to the user) per ten resident workers, with a ready water source for washing; - Provide roofed and partitioned wash-up areas with floors and proper drainage		- Lack of outbreaks of infectious illnesses (e.g., influenza, pneumonia, tuberculosis) and ailments associated with unsanitary conditions (e.g., dysentery, lice, scabies) - Living conditions meet standards specified in Construction Camp Management Plan - Drinking water quality (pH, TDS, EC, DO, BOD_5, COD, Chloride, SS, As, Fe, Total-N, Total-P, Total coliform, turbidity, temperature) meets standards indicated in the Environment Conservation Rules, 2023	construction (observation) Quantitative measurement quarterly by Contractor at source well	Quantifiable costs: Temporary disposal facilities BDT 100,000; Medical supplies: BDT 100,000; Drinking Water Quality: BDT 30,000 per sample = 8 times over construction period = BDT 30,000 x 8 = 240,000
44. Livelihoods	- Hire mostly or exclusively local workers on construction sites	EHSO CSC Contractor	- Workers from nearby area given priority in hiring for construction jobs	In advance of any new crews or subcontractors being brought on site	NQC (included in SDCMU, CSC, Contractor costs)
45. Physical cultural resources	- Establish a chance find procedure and provide training to all workers regarding its triggering conditions, and to site engineers on its implementation	CSC	- Chance finds procedure included in CEMP and training provided to workers and site engineers	Once before start of construction	NQC (included in SDCMU costs)
(iii) WASTE MANAGEMENT					

Parameter type	Prescribed measures	Monitoring entity	Monitoring parameters	When to monitor	Estimated monitoring cost in BDT
46. Demolition waste	- If there is any reason to suspect presence of asbestos-containing materials (ACM), implement approved ACM Removal and Disposal Plan - Ensure salvage of recyclable and reusable items - Use rubble in site development or dispose of in a site identified and approved in accordance with the Waste Management Plan embedded within the CEMP	EHSO CSC Contractor	- Any ACM assessed and removed and disposed of in accordance with approved ACM Removal and Disposal Plan - Recyclable materials salvaged - Rubble appropriately used as fill on site, or disposed of in accordance with Waste Management Plan embedded in CEMP	Before and during site clearing	NQC (included in SDCMU, CSC, Contractor costs)
47. Construction waste	- Implement all provisions in the Waste Management Plan embedded in CEMP, including: - Provide waste receptacles on the work sites and collect their contents daily or weekly as needed - Recycle all recyclables through local providers of this service - Compost organic wastes generated by construction camp kitchens - Dispose of non-recyclable and non-organic wastes as directed in the Waste Management Plan embedded within the CEMP, as based on locally available and approved disposal options	EHSO CSC Contractor	- All classes of waste managed in accordance with Waste Management Plan embedded in CEMP	Monthly for duration of construction	NQC (included in SDCMU, CSC, Contractor costs)
48. Waste oils	- Recycle waste oils through a reputable business providing this service, as identified in the Waste Management Plan	EHSO CSC Contractor	- No evidence of waste oil dumping or burning - Documentation of transfers to identified service provider available	Monthly for duration of construction	NQC (included in SDCMU, CSC, Contractor costs)
C. OPERATION PHASE					
(i) BIOPHYSICAL ENVIRONMENT					
49. Water quality	- Store fluids only within dedicated indoor storage spaces with secondary containment capacity equaling or exceeding 115% of the volume of the largest container stored - Routinely inspect storage spaces and tanks for leakage, and take immediate corrective action as needed - Remove sludge at least once per year from all septic tanks installed, and work into the soil around on-site tree plantations for fertilization	ESFP-BUTEX	- Proper storage observed - Absence of evidence of spills and leaks - Sludge removed from all septic tanks at least annually, and appropriately used to fertilize on-site tree plantations	Quarterly (fluid storage) Routine inspection - Once prior to start of operations (Spill Prevention and Response Plan), then once per year	NQC (Included in SDCMU and IBA budgets)

Parameter type	Prescribed measures	Monitoring entity	Monitoring parameters	When to monitor	Estimated monitoring cost in BDT
50. Drinking Water quality	- Install purification system for drinking water supply for the students and teachers	ESFP-BUTEX	- Water quality tests of pH, DO, NO_3^-, PO_4^- and E.Coli and compare to the ECR 2023 - Observe for colour and odor	Water quality test annually Observation and record keeping every month	NQC (Included in SDCMU and BUTEX budgets)
51. Water quality	- Prepare and implement Spill Prevention and Response Plan for the site. - Provide personnel training necessary for effective implementation of the plan prior to start of operations and annually thereafter	ESFP-BUTEX	- Spill Prevention and Response Plan prepared for the site prior to the start of operations. - Personnel training necessary for effective implementation of the Spill Prevention and Response Plan delivered before start of operations and repeated annually during operation phase	Once before start of operations, annually thereafter	NQC (Included in SDCMU and BUTEX budgets)
52. Water quality	- Purchase sufficient tarpaulins based on expected stockpiling activity, and make budgetary provision for regular replacement as needed - Strictly require the use of tarpaulins on all piles of mineral materials at all times, except during active handling of materials - Train personnel assigned to the minerals storage area in competent tarpaulin use - Regularly monitor tarpaulin condition and use - Regularly check and clean out sediment traps in minerals storage are	ESFP-BUTEX	- Thorough, competent use of tarpaulins on all materials stockpiles in minerals storage area observed to be standard procedure - Sediment traps in minerals storage area well maintained and functional - Runoff from minerals storage area is of sufficient quality not to cause violation of surface water standard (pH, BOD_5, COD, DO, SS, total coliform, Total P, Total N, turbidity) in receiving water body; compare to the Environment Conservation Rules, 2023	Quarterly	(Proportion of BUTEX EHS Unit costs for sampling/ equipment over 20 years)
53. Air quality	- Ensure adequate staffing at peak times to help ensure that incoming trucks are processed efficiently and lines do not form - Enforce a strict no-idling policy	ESFP-BUTEX	- Ambient air quality ($PM_{2.5}$, PM_{10}, SO_2, CO, NO2) meets standards indicated in the Air Pollution (control) Rules 2022.	Quarterly	(Proportion of BUTEX EHS Unit costs for sampling/ equipment over 20 years)
54. Air quality	- Purchase sufficient tarpaulins based on expected stockpiling activity, and make budgetary provision for regular replacement as needed - Strictly require the use of tarpaulins on all piles of mineral materials at all times, except during active handling of materials - Train personnel assigned to the minerals storage area in competent tarpaulin use - Regularly monitor tarpaulin condition and use	ESFP-BUTEX	- Thorough, competent use of tarpaulins on all materials stockpiles in minerals storage area observed to be standard procedure - Ambient air quality ($PM_{2.5}$, PM_{10}, SO_2, CO, NO_2) meets standards indicated in the Air Pollution (control) Rules 2022.	Quarterly	NQC (air sampling cost accounted for in previous line)

Parameter type	Prescribed measures	Monitoring entity	Monitoring parameters	When to monitor	Estimated monitoring cost in BDT
	- Ensure that appropriate basic misting equipment is purchased or purpose-built and kept in good working condition - Train personnel assigned to the minerals storage area in proper procedure for misting during materials handling - Strictly require misting as standard procedure during handling of dusty materials - Strictly prohibit stone crushing activity on the site, including the minerals storage area				
55. Air quality	- Strictly require all trucks entering the site to be equipped with tightly fitting tarpaulins - Sweep and spray roadways within the site as needed to limit dust	ESFP-BUTEX	- All trucks entering site observed to be appropriately covered - Roadways within the site swept and sprayed as needed to suppress dust - Ambient air quality ($PM_{2.5}$, PM_{10}, SO_2, CO, NO_2) meets standards indicated in the Air Pollution (control) Rules 2022	Quarterly	NQC (air sampling cost accounted for in previous line)
56. Soils	- Protect soils exposed by maintenance works with mulches and other protective coverings during works, and promptly re-establish vegetative cover when works have been completed - Regularly inspect site vegetation for loss of coverage and evidence of emerging gully erosion	ESFP-BUTEX	- Lack of evidence of gully erosion	Quarterly	NQC (Included in SDCMU and BUTEX budgets)
(ii) SOCIOECONOMIC AND CULTURAL ENVIRONMENT					
57. Public safety	- Regularly monitor facility operations for emerging public safety issues, and devise appropriate corrective action, as needed - Proactively coordinate with RHD/LGED to ensure that safety features including sidewalks, pullout and turn lanes, road markings, signage and other safety features are planned for and implemented in future approach road upgrades	ESFP-BUTEX	- Safety features implemented - Accident risk low	Quarterly	NQC (Included in SDCMU and BUTEX budget)
58. Public safety	- Pursue collaboration with RHD/LGED and local community leaders regarding durable solutions to safety risks from on-road and road-adjacent commerce, such as provision of alternative spaces outside the RoW for commercial and community activity	ESFP-BUTEX	- Low incidence of encroachment - Smooth traffic flow through settled areas - Low incidence of vehicle-pedestrian collisions	Quarterly	NQC (Included in SDCMU and BUTEX budget)

Parameter type	Prescribed measures	Monitoring entity	Monitoring parameters	When to monitor	Estimated monitoring cost in BDT
59. Worker health and safety	- Enforce a strict policy against engine idling	ESFP-BUTEX	- Low incidence of staff complaints about emissions exposure	Quarterly	NQC (Included in SDCMU and BUTEX budget)
60. Worker health and safety	- Integrate pandemic response measures in operations and maintenance manuals and operating protocols for the BUTEX site, to ensure prompt implementation when emerging threats are identified	ESFP-BUTEX	- Pandemic response measures integrated in operations and maintenance manuals	Once prior to start of operations	NQC (Included in SDCMU and BUTEX budget)
61. Worker health and safety	- Incorporate Emergency Response Plan in laboratory operating protocols, and provide regular training for technicians and support staff on its activation	ESFP-BUTEX	- Emergency Response Plan included in laboratory operating protocols - Regular training provided on activation of Emergency Response Plan	Once prior to start of operations (protocols) Annually (training)	NQC (Included in SDCMU and BUTEX budget)
62. Livelihoods	- Give priority to local people and firms in selecting Contractors for maintenance works and selected permanent positions in operations and maintenance	ESFP-BUTEX	- Local people well represented in construction workforce	Annually	NQC (Included in SDCMU and BUTEX budget)
63. GBV/SEA-SH (Social Safeguard)	- GBV/SEA-SH awareness training and Code of Conduct for all workers/supervisors - Site fencing, controlled access, adequate lighting - Separation of construction zones from dormitories/classrooms - Confidential survivor-centered GRM with dedicated focal point - Prohibition on hiring workers with prior GBV/SEA-SH offenses - Local labor sourcing prioritization - Coordination with BUTEX complaint committee	ESFP-BUTEX	- % of workforce trained and Code of Conduct signed - Functionality/accessibility of GRM (complaint box, hotline, focal point in place) - Number of complaints received, logged, resolved, and response time - Site fencing/lighting adequacy (visual inspection checklist) - Confirmation of no workers hired with documented prior offenses - Status of coordination with BUTEX complaint committee	- Prior to mobilization (baseline training/Code of Conduct compliance) - Monthly during construction (GRM functionality, complaint log review, site inspection) - Immediately upon any reported incident (ad hoc) - Quarterly reporting to PIU/ADB during construction period	NQC (Included in SDCMU and BUTEX budget)
(iii) WASTE MANAGEMENT					
64. Laboratory waste	- Integrate detailed Laboratory Waste Management Plan (developed by laboratory design specialist engaged	ESFP-BUTEX	- Detailed hazardous waste handling protocols specified in laboratory operations and maintenance manuals	Once prior to start of operations (protocols including waste	NQC (Included in BUTEX

Parameter type	Prescribed measures	Monitoring entity	Monitoring parameters	When to monitor	Estimated monitoring cost in BDT
	during detailed design) into laboratory operations and maintenance manual - Develop detailed protocols for waste classification, documentation, segregation, temporary storage and safe transport of hazardous wastes, and integrate these protocols into operations and maintenance manuals (laboratory design specialist to be engaged by Contractor during detailed design) - Provide training to laboratory technicians and maintenance staff on correct implementation of waste management protocols, before the laboratory becomes operational and on an annual basis thereafter - Specify parameters, measurement, and reporting for annual waste audit in laboratory waste management protocols - Conduct an annual waste management audit and implement corrective action as needed to address problematic trends		- Specifications for annual waste management audit integrated into laboratory waste management protocols - Annual waste management audit performed and reported - Discharges of liquid waste from laboratory meet standards indicated in Schedule 10 (Inland Surface Water) of the Environment Conservation Rules, 2023 (only if full-service lab)	management plans) Annually (waste audit) Quarterly (discharge)	budget for O&M)
65. Solid waste	- Ensure that appropriate waste management procedures for all components of the solid waste stream are specified in each facility's operations and maintenance manual	ESFP-BUTEX	- Recyclable solid waste is consistently segregated and picked up by a reputable recycling business - Non-recyclable solid waste is consistently taken to a legal landfill for disposal - Lack of evidence of waste dumping or burning on site	Quarterly	NQC (Included in BUTEX O&M budget)

296. As will be noted from the preceding table and figures, several entities are expected to submit regular monitoring reports as a fundamental contribution to effective implementation of the EMP. These reporting processes are summarized in Table IX-5 for clarity. A sample outline of a semi-annual monitoring report as must be prepared by the SOU for submission to ADB (which can also be adapted for quarterly monitoring reports as must be prepared for DOE) is provided in Appendix 18.

Table IX-5 Monitoring reporting requirements

Report type	Prepared by	Submitted to	Frequency
Construction phase			
Contractor EHS monitoring reports	Contractor	ESFP	Monthly
Site EHS monitoring reports	EHSO	ESFP	Monthly
Progress reports (safeguards sections)	ESFP	PIU/SOU	Quarterly
Environmental monitoring reports	SOU	DOE	Quarterly
Environmental monitoring reports	SOU	ADB	Semi-annually
Operation phase			
Environmental monitoring reports	BUTEX unit and SDCMU	DOE	Quarterly

E. Institutional strengthening and training requirements

297. Implementation of environmental safeguards on infrastructure projects in Bangladesh has tended to be weak, as is often evident even to the casual observer passing by poorly fenced construction sites where few workers can be seen using appropriate personal protective equipment. Incomplete EMP compliance is largely a function of two factors: (i) inadequate capacity in institutions charged with oversight; and (ii) a low level of awareness and knowledge on the part of local subcontractors and their workers.

1. Institutional capacity

298. **Project-specific oversight entities.** Oversight of EMP implementation rests in large part on the PIU (at BUTEX) and its SOU. SOU should, as a matter of course, be staffed by environmental professionals with strong prior knowledge of safeguards requirements and solid understanding of environmental and social impact analysis in relation to infrastructure and be supported with resources adequate to carry out its duties. Site-level oversight is to be provided by the SDCMU and BUTEX and their EHSOs during the construction period. The EHSOs should have prior environmental training and be adequately supported by SDCMU and BUTEX[58]. Assuming professionals with appropriate qualifications and experience are engaged for environmental positions within the SOU, institutional capacity for implementing the EMP should be sufficient.

299. **EA EHS units.** Neither SDCMU nor BUTEX has a functioning permanent internal unit with capacity sufficient to oversee implementation of environment, health and safety safeguards at agency-owned sites and facilities. This means that implementation of the EMP during the operation phase—including monitoring of compliance and effects—have almost no likelihood of being properly carried out. This applies not only to the investments at BUTEX, but to all infrastructure owned and operated by these agencies. The capacity to carry out the operation phase elements of the EMP needs to be established in both agencies. It bears emphasis that

[58] As has been discussed above, it will be acceptable for there to be just one EHSO for the works at the BUTEX, given the limited scale of works and proximity of sites. SDCMU and BUTEX will decide how to share cost and supervision responsibility for the EHSO.

SDCMU and BUTEX should have this kind of in-house capacity to carry out operation-phase EMP implementation tasks for all of their infrastructure development projects, not just this one. The proposed capacity building program should be seen as an opportunity to develop capacity with wider application; capacity building efforts mandated under future projects can build upon the foundation established under this project.

300. A capacity building program for EHS units within SDCMU and BUTEX should be developed and delivered in the interval between the project's approval and the end of construction on the first round of investments. The capacity development program should aim to establish stable, sustainable EHS units capable of (i) proactively and professionally driving compliance with national and multilateral-mandated environmental clearance and environmental assessment requirements in relation to proposed, under-construction and operational infrastructure investments; (ii) collaborating productively with specialists hired under the auspices of major investment projects; (iii) carrying out long-term EHS monitoring for all agency facilities; and (iv) building a culture of sustainability and safety across their home agencies through awareness-raising and educational campaigns.

301. Capacity investments should include support for hiring and resourcing adequate staff commensurate with the needs of the agency, and staff training. The capacity building program should include the following elements: (i) needs assessment; (ii) capacity-building plan including recommendations for staffing and resources; and (iii) training program for each EA's EHS unit. Design, development and delivery of the capacity building program is appropriately included in the mandate of the CSC engaged to oversee implementation of the project works. The CSC should be supported in this work by the SOU, and the ESPFs of SDCMU and BUTEX.

2. Training needs

302. **Contractors.** International construction contractors working in Bangladesh are well aware of safeguards requirements, and knowledgeable on global best practices in impact mitigation and site management. Effective oversight and enforcement, not training, is needed to ensure strong EMP performance from these firms. However, the local firms acting as contractors or sub-contractors, which will undertake most of the physical work of infrastructure development, can in most cases be expected to be less aware and less experienced regarding safeguards requirements, and minimally concerned with international standards of practice. Local firms will benefit from training to strengthen their knowledge and awareness and help ensure strong compliance on this project and other projects in the future.

303. Training for contractors/sub-contractors should be developed by the SOU in collaboration with the CSCs and be delivered by the CSC prior to the start of construction, and whenever weak compliance warrants refresher training. Training for contractors/sub-contractors should cover the following topics:

(i) rationale for safeguards requirements in infrastructure development;
(ii) ADB safeguards requirements;
(iii) national safeguards requirements;
(iv) primary contractors' legal and contractual responsibilities with respect to compliance with national environmental and labor rules;
(v) sub-contractors' legal and contractual responsibilities with respect to compliance with national environmental and labor rules;
(vi) environmental monitoring processes and enforcement;

(vii) best practices in construction site management and environmental mitigation; and
(viii) emergency response plans and their implementation.

304. **Workers.** Primary contractors and their sub-contractors should provide adequate training to workers in their employ to ensure safe and sanitary workplaces and full compliance with all prescriptions of the EMP but often fall short in this regard. It is therefore usually necessary and appropriate for the PIU to implement supplemental worker training. Such training should be designed by the SOU in collaboration with the CSC and implemented by the SOU through the site-level EHSOs. Worker training should be provided prior to the start of construction, and whenever new sub-contractors and crews of workers are brought onstream; refresher training should be given any time site monitoring reveals recurrent patterns of non-compliance that can be attributed to lack of worker knowledge or awareness.

305. Training for workers should encompass the following topics:

(i) rationale for EHS requirements on construction sites;
(ii) workplace safety practices, including, but not limited to, proper use of task-appropriate personal protective equipment;
(iii) safe handling of noxious substances used in construction;
(iv) proper procedure for avoiding spills during refueling and equipment maintenance;
(v) fire safety, including fire prevention and use of fire extinguishers;
(vi) reporting observed spills, leaks, physical hazards and other potentially urgent matters to site managers;
(vii) proper solid waste management practices;
(viii) sanitation and personal cleanliness in toilets, cooking and eating areas, wash-up facilities and employer-provided accommodations; and
(ix) existence and use of the Grievance Redress Mechanism.

306. **Facility managers.** During the operation phase, ongoing mitigation of potential impacts is subsumed within regular facility operations, guided by operations and maintenance manuals, as well as protocols for workplace safety, emergency response and routine monitoring of buildings and equipment. Work carried out at operational facilities by external maintenance contractors also needs to be monitored for compliance with the EMP by the facilities' regular personnel. Accordingly, it is appropriate for facility managers, their designated EHS personnel, and other staff to receive training to allow them to undertake such work with confidence.

307. Training for facility operators should address the following:

(i) the EMP and its relevance to operations;
(ii) linkages between the EMP and operations and maintenance manuals;
(iii) best EHS practices in facility management;
(iv) emergency response plans and their implementation;
(v) monitoring maintenance contractors; and
(vi) EMP reporting requirements.

308. Facility personnel should be given training prior to the end of construction, as soon as operations and maintenance manuals and emergency response plans have been finalized and approved by the SOU and CSC. Training should be designed by the CSC and organized and delivered by the new SDCMU and BUTEX EHS units. Periodic refresher training may be appropriate throughout the operation phase, especially following turnover of key personnel

positions or if monitoring carried out by the SDCMU and BUTEX EHS units indicates recurrent compliance issues.

309. **Institutional strengthening.** The PMU will lead the implementation of the EMP assisted by the consultants, with responsibility for such key tasks as ensuring project readiness; reviewing and approving designs and plans; ensuring that environmental information in bid documents and environmental clauses in construction contracts are on target; providing training on environmental mitigation measures; supervising and directing environmental monitoring; and providing guidance on environmental matters whenever needed. The work and leadership of the environmental consultants will strengthen environmental management and supervision capacity of the EA, IAs, PMU and contractors, and ensure the project's full compliance with the ADB's SPS.

310. In addition to the activity of the environmental consultants, the project's environmental management and supervision will be enhanced by engagement of a licensed laboratory to undertake quarterly site monitoring, including quantitative measurement of air quality and noise levels at all active construction sites; this importation of technical monitoring expertise will ensure adherence to DoE standards. Finally, all contractors will be required to hire an Environment, Health and Safety Officer (EHSO) for each site under their control and empower that officer to manage the implementation of an Environment, Health and Safety Management Plan (EHSMP) for the site. With the guidance, support and supervision of the environmental consultants, the EHSOs will play a key role in ensuring sound implementation of environmental mitigation measures prescribed by the EMP. It is believed that these institutional strengthening measures will enable competent and efficient environmental management of the project. The institutional strengthening plan is summarized in Table IX-6.

Table IX-6 Institutional Strengthening Measures

Target Agencies	Institutional strengthening measures	Timing
MoF	Define institutional arrangements for environmental management, monitoring and supervision Define positions and responsibilities	During project preparation
SDCMU	Recruit and contract one national environmental consultant for environmental management, environmental training, EMP compliance review, and reporting	At start of pre-construction phase
CSC / BUTEX	Recruit and contract licensed laboratory for quarterly environmental monitoring before and during construction phase	Prior to start of construction
Contractors	Hire Environment, Health and Safety Officers for each construction site	Prior to start of construction
Contractor / Workers	Work Health and Safety training on periodic basis	Before start of the construction and quarterly until end of construction

311. **Training.** Selected personnel of the MoF, BUTEX, SDCMU and contractors will receive training in environmental management, environmental monitoring and supervision, mitigation planning, emergency response, public consultation and use of GRM, occupational and community health and safety, and other environmental management topics. The topics, methods, and estimated costs of the training are outlined in Table IX-7. Training sessions will use a workshop

format. Training will be developed and provided by the environmental consultants with the support of other experts engaged in the grant implementation of consultant services.

Table IX-7 Training requirements and estimated cost

Training target	Developed by	Delivered by	Timing	Estimated cost for this location
Contractor	SOU/CSC	SOU/EHSO	Once before start of construction, periodically during construction on quarterly basis	BDT 30,000 per session 9 sessions over 2 years = BDT 30,000*9 = 2,70,000
Workers	SOU/CSC	SOU/EHSO	Once before start of construction, weekly toolbox meeting at site	BDT 50,000 for first session, arrange toolbox meeting on site at Contractor cost
Facility managers	SOU	TMED EHS Unit	Before start of operations	BDT 100,000
Teachers, Students and Facility managers	BUTEX	BUTEX	Before starting of laboratory operation on laboratory safety, hazardous material management etc.	BUTEXT operational cost
Training Topics. EMP Implementation: Roles and Responsibilities, Monitoring, Supervision and Reporting Procedures Grievance Redress Mechanism: Roles and Responsibilities, Procedures, Occupational and Community Health and Safety, Emergency Preparedness and Response, Pollution Control and Environmental Monitoring, Inspection and Reporting, Public Consultation, Contractor Engagement and Management, including EMP Enforcement, Operation-Phase Environmental Management and Monitoring				

F. EMP Implementation cost

312. Cost estimates for mitigation measures, environmental monitoring, public consultations, and capacity building are summarized in Table IX-8. Contractors will bear the direct costs of all mitigation measures during construction, which will be included in the tender and contract documents; this includes features built into facility designs in order to prevent environmental impacts from arising. The MoF SDCMU and BUTEX will bear the costs related to mitigation measures during operation. Costs related to environmental supervision during construction will be borne by the SDCMU (for hiring a licensed laboratory to conduct quarterly monitoring), the PMU (for the activities of the environmental consultants) and by the contractors (for monitoring work carried out by the EHSOs). During the operation phase and monitoring costs will be borne by the SDCMU and BUTEX (for regular monitoring activity of their site EHSOs).

Table IX-8 EMP implementation cost

Note: The EMP cost will be included in the BOQ as a provisional sum (non-competitive) item				
Sl. No	**Description of activity**	**Unit cost (BDT)**	**Calculation**	**Cost (BDT)**
1	Recruit and appoint EHSO as site for 24 months by the contractor (verified by CTEC ESHO)		Refer to tender data sheet (personnel cost)	-
2	Tree plantation at site and maintenance for 2 years as required and as per direction of the E.I.C. Plantation should be following the	BDT 500 per sapling (sapling, fencing,	10 trees x BDT 500	5,000

Note: The EMP cost will be included in the BOQ as a provisional sum (non-competitive) item				
Sl. No	**Description of activity**	**Unit cost (BDT)**	**Calculation**	**Cost (BDT)**
	suggestion in the EMP table. The payment is to be made only when trees are fully grown)	mulching, watering etc)		
3	Debris disposal and waste management on camp sites. Temporary camp site waste disposal facility improvement 2 nos (1 no of organic waste and 1 no of inorganic waste disposal facility) Site cleaning, Removal and disposal activities	lump sum	BDT 100,000	100,000
4	Traffic management during construction, equipment for traffic management (traffic controller employment)	lump sum	BDT 50,000	50,000
6	Medical supplies (First Aid box), other medical requirements, note, equipment, kits, dress etc.	lump sum	BDT 100,000	100,000
7	Waste collection facilities with collection bins, scheduled disposal, carry to designated places, waste separation process etc	lump sum	BDT 100,000	100,000
8	Health safety warning signs and log maintenance, COVID-19 response as identified in the EMP	lump sum	BDT 50,000	50,000
9	Personal Protection equipment, EMP implementation briefings (monthly)	lump sum	BDT 100,000	100,000
10	Conduct environmental baseline: - Ambient air quality ($PM_{2.5}$, PM_{10}, SO_2, CO, NO_2); compare to the Air Pollution Control Rules 2022 (minimum 8 hr sampling period) - Adjacent surface waters (pH, BOD_5, COD, DO, SS, total coliform, Total P, Total N, turbidity); compare to the Environment Conservation Rules, 2023 - Groundwater in wells on site or nearby (pH, TDS, EC, DO, BOD_5, COD, Chloride, SS, As, Fe, Total-N, Total-P, Total coliform, turbidity, temperature); compare to the Environment Conservation Rules, 2023 - Ambient noise (dBa daytime, dBa night); compare to Noise Pollution Control Rules 2006	Air quality: BDT 25000; Water quality: BDT 30000; Groundwater quality: BDT 30000; noise measurement: BDT 10000 per sampling time	BDT 95,000	95,000
11	Monitoring: - Ambient air quality ($PM_{2.5}$, PM_{10}, SO_2, CO, NO2) - Adjacent surface waters (pH, BOD_5, COD, DO, SS, total coliform, Total P, Total N, turbidity) - Groundwater in wells on site or nearby (pH, TDS, EC, DO, BOD_5, COD, Chloride, SS, As, Fe, Total-N, Total-P, Total coliform, turbidity, temperature) - Ambient noise (dBa daytime, dBa night)	Air quality: BDT 25000; Water quality: BDT 30000; Groundwater quality: BDT 30000; noise measurement: BDT 10,000 per sampling time	Over 2 years of construction period total 8 samples = BDT 95000 x 8 =	760,000
12	Construction of male female toilets (adequate quantities as per satisfaction of the ESFP	Lump sum		200,000
13	Worker shed	Lump sum		200,000
14	Training cost (as described in Table IX-7)	Lump sum		420,000
15	Dust suppression, drainage management, community health & safety management etc.	Contractor cost		0
16	GBV/SEA-SH campaign	Lump sum		200,000
Total cost				2,380,000

X. CONCLUSION AND RECOMMENDATION

A. Conclusion

313. This IEE has been prepared for the proposed Executive Development Centre (EDC) building at Bangladesh University of Textiles (BUTEX) based on (i) desktop review of available project information and applicable national requirements, (ii) field reconnaissance of the proposed site and the surrounding campus environment, and (iii) consultations with relevant institutional stakeholders and representatives of the public within the project's area of influence. The assessment considers the environmental, occupational health and safety, and community health and safety impacts that may reasonably occur during pre-construction, construction, and operation. The Environmental Management Plan (EMP) has been developed in accordance with ADB's Safeguards Policy Statement (SPS, 2009) and applicable Department of Environment (DoE) requirements, and aligns with recognized international good practice, including the World Bank Group EHS Guidelines.

314. The proposed EDC is a high-rise academic facility within an operational university campus and includes features such as basement parking, multiple teaching and administrative floors, and specialized spaces including laboratories and rooftop functional zones (e.g., solar panels and roof garden). The project is technically feasible and demonstrates clear opportunities to integrate environmental performance into design and operations, particularly through energy efficiency measures, campus-sensitive construction planning, and landscape/roof greening components.

315. The environmental assessment indicates that the project's potential adverse impacts are site-specific, largely temporary (construction phase), and manageable provided that the EMP is implemented effectively and translated into enforceable contractor obligations through a robust Construction Environmental Management Plan (CEMP). Particular attention is required for (i) dust and noise control in a campus setting, (ii) drainage and sediment management during monsoon, (iii) occupational health and safety for working at height and basement works, and (iv) environmental health and safety provisions for laboratory-related functions during operation.

316. The project is expected to generate positive environmental and functional outcomes, including improved learning and training infrastructure, enhanced campus amenity through landscaped/green elements where feasible, and potential reductions in operational energy demand if the design intent for shading, ventilation, and efficient building systems is maintained through detailed design and construction. With appropriate controls, the building can support a healthier indoor environment for users and improved campus functionality.

317. Key risks identified—such as construction dust, noise, traffic and pedestrian safety conflicts, temporary disturbance to existing greenery, generation of construction waste, and runoff-related water quality impacts—are typical for multi-storey building construction and can be mitigated through standard, well-supervised construction environmental management measures supported by monitoring and responsive corrective actions.

318. Considering the project's location within an established institutional campus, the absence of environmentally sensitive habitats within the immediate project footprint, and the availability of proven mitigation measures, the project's overall environmental impacts are assessed as minor to moderate, localized, and manageable, provided that the safeguards measures set out in the EMP and CEMP are implemented in full and monitored throughout the project lifecycle.

B. Recommendations

319. Although some residual adverse impacts may remain—particularly nuisance impacts during construction—these are expected to be temporary and can be reduced to acceptable levels through strict implementation of the EMP/CEMP, effective supervision, and a functioning grievance redress mechanism (GRM). Stakeholder consultations conducted during IEE preparation indicate generally positive expectations regarding the investment benefits, alongside expressed concerns related mainly to dust, noise, and safety during construction. These concerns should be addressed proactively through information disclosure, construction scheduling, and responsive complaint handling.

320. The major recommendations made in the IEE are as follows:

(i) Implement the EMP across all phases.
   a. Fully implement the Environmental Management Plan (EMP) covering pre-construction, construction, and operation;
   b. Establish and communicate clear institutional roles and responsibilities for safeguards implementation, including contractor obligations and supervision arrangements;
   c. Undertake regular monitoring, documentation, and reporting of EMP compliance throughout the project cycle, with corrective actions tracked to closure.

(ii) Prepare and enforce a project-specific CEMP prior to mobilization. The Contractor shall prepare a comprehensive Construction Environmental Management Plan (CEMP) consistent with the EMP and tailored to the campus context, including at minimum:
   a. dust suppression and air quality controls;
   b. noise and vibration management (work hours, equipment controls, scheduling);
   c. campus traffic and pedestrian safety management (access control, signage, spotters, delivery windows);
   d. erosion control and stormwater/sediment management, particularly for monsoon conditions and basement works;
   e. waste management and materials handling (including hazardous materials such as paints, solvents, oils); and
   f. occupational health and safety measures for high-rise construction (working at height, lifting operations, confined spaces, electrical safety).

(iii) Integrate EMP requirements and costs into procurement documents. EMP, including the bill of quantities and monitoring/reporting requirements, shall be included in the bidding documents and reflected in the contractor's priced items to ensure resources are available for full compliance.

(iv) CEMP approval and implementation. The Contractor shall submit the site-specific CEMP prior to commencement of construction activities. The CEMP shall be reviewed and cleared up by SDCMU/PIU and the Construction Supervision Consultant (CSC) and implemented as a contractual requirement. Any revisions required during construction shall be submitted for approval and documented.

(v) Secure DoE clearance and maintain regulatory compliance. The Executing Agency and implementing institutions shall obtain required DoE clearances (SCC/ECC, as applicable) prior to construction. This IEE is prepared to

support the clearance process; if DoE issues conditions or additional requirements prior to or during ECC issuance, the MoF/PIU shall ensure timely updating of the IEE/EMP and integration of these conditions into the CEMP and contract management. An Environmental Safeguards Focal Person/Environmental Specialist should be designated within SDCMU/PIU before construction commences to oversee safeguards implementation, coordinate monitoring and reporting, and ensure compliance with ADB SPS and national requirements.

APPENDICES

Appendix 1 – Relevant National Environmental Standards

Bangladesh Ambient Air Quality Standard as adopted in 2022.

Pollutant	Objective	Average
CO	05 mg/m^3	8 hours[a]
	20 mg/m^3	1 hour[a]
Pb	0.25 µg/m^3	Annual[b]
	0.50 µg/m^3	24 hours[a]
NOx	40 µg/m^3	Annual[b]
	80 µg/m^3	24 hours[a]
PM_{10}	50 µg/m^3	Annual[b]
	150 µg/m^3	24 hours[a]
$PM_{2.5}$	35 µg/m^3	Annual[b]
	65 µg/m^3	24 hours[a]
O_3	180 µg/m^3	1 hour[a]
	100 µg/m^3	8 hours[a]
SO_2	250 µg/m^3	1 hour[a]
	80 µg/m^3	24 hours[a]
NH_3	100 µg/m^3	Annual[b]
	400 µg/m^3	24 hours[a]

Notes:
(a) Not to be exceeded more than once per year
(b) The objective is attained when the annual arithmetic mean is within the standard

(ECR 2023)
Standard for Water

(A) Standard for inland surface water

Best Practice based classification	Parameter					
	pH	BOD mg/l	DO Mg/l	Total Coliform CFU/100	TDS (mg/l)	COD (mg/l)
a. Source of drinking water for supply only after disinfecting:	6.5-8.5	≤2	≥6	≤100	1000	10
b. Water usable for recreational activity:	6.5-8.5	≤3	≥5	≤50	1000	10
c. Source of drinking water for supply after conventional treatment:	6.0-9.0	≤3	≥5	≤5000	1000	25
d. Water usable for fish culture	6.0-9.0	≤6	≥5	≤5000	1000	50
e. Water usable by various process and cooling industries:	6.5-8.5	12	≥1	-	1000	100
g. Water used for irrigation	6.5-8.5	≤12	-	≤50,000	1000	100

Notes:

1. Electrical conductivity for irrigation water -2250 µmhoms/cm (at a temperature of 25^0C); Sodium less than 26%; boron less than 0.2%.

(B) Standard for drinking water

Sl. No.	Parameter	Unit	Standards
1	2	3	4
1	Fecal Coliform	CFU/100ml	0
2	Total Coliform	CFU/100ml	0
3	NO_3^-	Mg/l	45
4	As	Mg/l	0.05
5	Turbidity	NTU	5
6	NH_3	Mg/l	1.5
7	Chloride	Mg/l	250
8	pH		6.5-8.5
9	K	Mg/l	12
10	Mg	Mg/l	30-35
11	Hg	Mg/l	0.001
12	NO_2	Mg/l	1.0
13	Na	Mg/l	200
14	SO_4^{-2}	Mg/l	250
15	TDS	Mg/l	1000

SCHEDULE - 4
Standard for Sound
(as adopted 2006)

Sl. No.	Category of areas	Standards determined at dBa unit	
		Day	Night
a.	Silent zone	50	40
b.	Residential area	55	45
c.	Mixed area (mainly residential area, and also simultaneously used for commercial and industrial purposes)	60	50
d.	Commercial area	70	60
e.	Industrial area	75	70

Notes:
The time from 6 a.m. to 9 p.m. is counted as daytime.
The time from 9 p.m. to 6 a.m. is counted as nighttime.
Area up to a radius of 100 meters around hospitals or educational institutions or special institutions/ establishments identified / to be identified by the Government is designated as Silent Zones where use of horns of vehicles or other audio signals, and loudspeakers are prohibited.

Standards for Sound originating from Motor Vehicles or Mechanized Vessels

Category of Vehicles	Unit	Standards	Remarks
* Motor Vehicles (all types)	dBa	85	As measured at a distance of 7.5 meters from exhaust pipe.
		100	As measured at a distance of 0.5 meter from exhaust pipe.
Mechanized Vehicles	dBa	85	As measured at a distance of 7.5 meters from the vessel which is not in motion, not loaded and is at two thirds of its maximum rotating speed.
		100	As measured at a distance of 0.5 meter from the vessel which is in the same condition as above.

* All the time of taking measurement, the motor vehicle shall not be in motion and its engine conditions shall be as follows: -

(a) Diesel engine – maximum rotating speed

(b) Gasoline engine – at two thirds of its maximum rotating speed and without any load.

(c) Motorcycle – If maximum rotating speed is above 5000 rpm'; two-thirds of the speed, and if maximum rotating speed is less than 5000 rpm, three-fourth of the speed.

Standard for Emission from Motor Vehicles

Parameter	Unit	Standard Unit
Black Smoke	Hartridge Smoke Unit (HSU)	65
Carbon Monoxide	gm/km Percent area	24 04
Hydrocarbon	gm/km ppm	02 180
Oxides of Nitrogen	gm/km ppm	02 600

* As measured at two thirds of maximum rotating speed.

Appendix 2 – Environmental Audit Report for BUTEX Executive Development Center

A. INTRODUCTION

ADB's Safeguards Policy Statement (SPS, 2009) requires an environmental audit when a project involves facilities and/or activities that already exist or are under construction, including an on-site assessment to identify past or present environmental concerns and associated liabilities. The proposed investment for the Executive Development Centre (EDC) building at Bangladesh University of Textiles (BUTEX) will be implemented within an operational university campus and will utilize existing campus infrastructure and services such as land access, internal roads, drainage connections, and utilities. Therefore, an environmental audit has been undertaken to identify any existing environmental, health, and safety concerns within and immediately surrounding the subproject boundary that could influence project implementation, compliance, or risk management.

B. SUBPROJECT SETTING

The proposed BUTEX EDC is a multi-storey academic and training facility (G+11) with one basement level and an approximate total floor area of 12,980 m². The building program includes a range of institutional functions (classrooms/training rooms, administrative areas, and specialized spaces including laboratories), supported by vertical circulation and service areas. The project is located within a built-up and active campus environment where construction activities must be carefully managed to minimize disruption to academic operations and to ensure safety of students, staff, and visitors.

Key physical characteristics relevant to the audit include:

- Basement level intended for parking and service/engineering functions, requiring careful drainage control and safe ventilation planning during both construction and operation.
- Rooftop functional zones that include roof utilities and water storage and are planned to accommodate solar panels and roof garden elements, which introduce specific requirements for stormwater control, safe access, and working-at-height measures during construction and maintenance.
- Provision of on-site green/landscaped area (noted as 510 m² in project information), requiring protection of existing greenery and reinstatement after construction.

Existing environment and infrastructure context: The site is within an urbanized campus setting with existing internal circulation, drainage lines, and utility corridors. Environmental sensitivities are primarily related to nuisance and safety (dust, noise, traffic conflicts), drainage performance during monsoon, and management of wastes (construction and operational), rather than impacts to ecologically critical habitat.

C. ENVIRONMENTAL ISSUES

1. Existing conditions and potential construction-phase issues

Air quality and dust: Earthworks, concrete works, material handling, and haul traffic may generate dust affecting nearby campus users and adjacent buildings. Because the project is within an operational campus, tolerance for nuisance is low and control measures must be continuous and well-documented.

Noise and vibration: Machinery, piling (if used), cutting, drilling, and material unloading can disrupt academic activities. Daytime-only construction windows and schedule coordination with campus operations are essential.

Drainage, stormwater, and sediment control: Campus drainage systems can be vulnerable during heavy rainfall, and construction runoff can clog drains if silt control is weak. Basement excavation works create heightened vulnerability to inundation and slope instability during monsoon.

Vegetation and campus landscape disturbance: Temporary disturbance or removal of campus trees/shrubs may occur if protection and access planning is inadequate. Loss of vegetation also increases erosion risk.

Waste generation: Construction waste, packaging, scrap metals, and potentially hazardous materials (paint, solvents, oils) require segregation, storage, and off-site disposal through approved channels to avoid pollution and complaints.

2. Design- and operation-related environmental issues

Green infrastructure performance: Rooftop garden/greening systems and landscape features require realistic provisions for soil depth, drainage, waterproofing, irrigation, and safe maintenance access—otherwise features may fail and create leakage or mosquito breeding risks.

Water systems and quality control: The audit highlights the need for robust potable water safety measures and separation from any non-potable uses (e.g., rainwater harvesting), including backflow prevention and operational monitoring.

Laboratory environmental health and safety: Because the EDC includes laboratory spaces, the operational phase requires provisions for safe chemical storage, ventilation (local exhaust where applicable), emergency equipment (eyewash/shower where relevant), and segregation of hazardous and non-hazardous laboratory wastes.

Energy and climate performance: High-rise buildings with extensive envelope area can drive high cooling demand if shading and efficient systems are not retained through detailed design and construction. Rooftop solar integration (where applicable) and efficient MEP systems are key opportunities.

Solid waste management: Operational waste streams from classrooms, offices, cafeterias, and labs require a practical segregation and collection system with defined responsibilities and service routes.

D. MAJOR RECOMMENDATIONS

1. Immediate implementation requirements

Environmental Management Plan (EMP): Implement the EMP across design, construction, and operation with clear performance indicators, responsibilities, and reporting requirements.

Construction Environmental Management Plan (CEMP): The Contractor shall prepare a CEMP prior to mobilization, aligned with the EMP and campus constraints, including:
(a) dust suppression and air quality controls;
(b) noise control measures and scheduling to protect academic activities;
(c) vegetation protection and reinstatement protocols;
(d) erosion, sediment, and stormwater controls, with strong monsoon preparedness; and
(e) waste management and hazardous material handling procedures.

2. Design optimization recommendations

Green building and roof systems:
(a) Ensure rooftop garden/green features (where planned) are supported by adequate soil depth, drainage layers, waterproofing, and irrigation;
(b) provide safe access for maintenance of rooftop assets including solar/roof utility zones; and
(c) avoid creating stagnant water zones (mosquito breeding risk).

Water management:
(a) If rainwater harvesting is included, size storage and treatment realistically for intended uses;
(b) maintain strict separation between potable and non-potable systems; and
(c) include backflow prevention and maintenance access in design.

Energy efficiency:
(a) Maintain shading/louver intent where adopted;
(b) specify energy-efficient HVAC and controls appropriate for mixed uses (labs vs training rooms vs admin); and
(c) incorporate efficient lighting and appliances to reduce operational loads.

3. Operational management recommendations

Monitoring and compliance:
(a) quarterly environmental monitoring during construction with corrective actions tracked to closure;
(b) post-occupancy environmental performance review (e.g., annually) covering energy, water, waste, and roof/landscape performance; and
(c) laboratory EHS monitoring where labs are operational.

Stakeholder engagement:
(a) continue consultation and disclosure (campus notices, schedule updates);
(b) ensure GRM functionality for environmental and safety concerns; and
(c) encourage campus user awareness (waste segregation, water conservation, reporting issues).

Adaptive management:
(a) allow EMP/CEMP to be updated if design or site conditions change;
(b) strengthen incident reporting and corrective action systems; and
(c) integrate with existing BUTEX campus management systems.

E. ENERGY AND GREENHOUSE GAS EMISSIONS

Construction and operation of a multi-storey RCC building can generate substantial emissions, particularly due to embodied carbon in cement/concrete and steel, transport of heavy materials, and operational energy demand for cooling and ventilation. Opportunities to reduce emissions include (i) optimizing structural material quantities, (ii) using lower-carbon concrete mixes where feasible, (iii) maximizing local sourcing, and (iv) maintaining passive design intent and efficient MEP systems. Rooftop solar integration can further offset grid electricity demand where technically and financially feasible.

Possible design-phase measures for climate change mitigation

Climate change mitigation measure	Rationale
1. Optimize RCC design to reduce cement demand without compromising safety	Concrete is carbon-intensive; optimization lowers embodied CO_2e
2. Use blended/low-carbon cement and SCMs where feasible	Reduces clinker content and embodied emissions
3. Maximize local sourcing of heavy materials	Reduces transport-related emissions
4. Implement construction waste minimization and reuse	Lowers embodied carbon from replacement materials
5. Integrate rooftop photovoltaic generation where feasible	Offsets grid electricity and reduces operational emissions
6. Specify high-efficiency HVAC, pumps, lifts, and controls	Reduces long-term operational energy

Climate change mitigation measure	Rationale
7. Use fuel-efficient backup generator (if required) and minimize runtime	Reduces diesel emissions
8. Incorporate mixed-mode ventilation strategies where appropriate	Reduces cooling demand during shoulder seasons
9. Prioritize shading through façade elements and landscaping	Lowers heat gain and cooling loads
10. Improve envelope thermal performance (glazing/shading coordination)	Reduces cooling demand and improves comfort
11. Use daylighting strategies to reduce artificial lighting demand	Cuts electrical loads
12. Install water-efficient fixtures and leak control	Reduces water pumping and treatment energy
13. Provide separate plumbing where non-potable reuse is applied	Reduces energy-intensive potable water treatment demand
14. Solar water heating where feasible (limited to applicable uses)	Reduces electricity for water heating
15. Use smart/controlled lighting for outdoor and low-use areas	Avoids unnecessary energy use
16. Use drought-tolerant native species in landscape	Reduces irrigation energy demand
17. Reduce idling and optimize delivery logistics during construction	Cuts direct fuel emissions
18. Green roofs/roof garden where compatible with roof functions	Lowers roof heat gain and improves microclimate
19. Integrate lightning protection	Reduces climate-related damage risk and downtime

D. ACTION PLAN

Time frame	Action
Design stage	- Finalize EMP and integrate safeguard specifications into design and procurement.- Confirm roof systems (solar/roof garden/roof utility) include safe access, drainage, waterproofing, and O&M requirements. - Finalize drainage and stormwater management design suitable for monsoon conditions and basement protection.- Finalize laboratory EHS design provisions (ventilation, storage, emergency equipment, waste handling). - Obtain required environmental permits/clearances and incorporate any conditions into EMP/CEMP.
Construction phase	- Prepare and approve CEMP; train all site staff and subcontractors on environmental and safety requirements.- Implement dust/noise controls and campus traffic/pedestrian safety measures continuously.- Implement erosion and sediment controls, with heightened monsoon preparedness for excavation and basement works.- Segregate, store, and dispose of wastes properly (including hazardous materials).- Maintain daily/weekly inspection logs and corrective action tracking.
Operation phase	- Implement operational environmental procedures (energy/water/waste/roof maintenance).- Establish drinking water quality monitoring (microbial testing and corrective actions).- Implement solid waste segregation and scheduled collection, including lab waste procedures if labs are operational.- Conduct periodic environmental performance review and update operational practices based on findings.

Appendix 3 – Environmental and Social Screening Checklist

Results Based Lending Environmental and Social Screening Checklist for Bangladesh: Skills for Industry Competitiveness and Innovation Program (SICIP)

Screening for eligible activities: *This checklist will be used for screening activities that would be eligible for RBL financing. The RBL program will be categorized according to the Safeguard Policy Statement and the relevant operation manual definitions. At the concept stage, program team is required to submit the environment, involuntary resettlement and indigenous peoples categorization form to SDSS (standard template) for review and CCO's concurrence. The project team shall complete this screening checklist and include as a supplementary document to the Categorization form to be submitted to SDSS for confirmation of eligible activities under the RBL program. During preparation of the PSSA, program team is encouraged to update SDSS on the type of activities likely to be considered for funding under the RBL program.*

	Risk	Assessment
1.	**Likely Environment and Social Impacts**	
Describe the potential environmental and social benefits, impacts and risks that are likely to be associated with the Program component activities?		
Type, sensitivity of location, scale and magnitude of potential adverse impacts and risks; - Describe the RBL program scope, the nature and type of activities, benefits and risks associated with the program - What will be the scale, severity/significance of adverse environmental and social impacts (past present and future, direct, indirect, cumulative, site specific characteristics, impact on critical habitat, potential loss or conversion of natural habitats, changes in land use, nature and scale of involuntary resettlement, changes in access to resources). - What will be the impact on indigenous peoples/ communities? - Where are the activities sited? Whether they are in an environmentally or socially sensitive location? - Whether there will be damages to cultural heritage, indigenous knowledge and livelihood systems? - What would be the extent of impact on vulnerable groups? - Will there be issues related to community safety and workers occupational health and safety?	Initial risk assessment for Environment: The BUTEX EDC subproject involves construction of a 12-storied (G+11) academic and training facility with one basement, classified as Building Type B1 under BNBC, on a 2,050 sqm plot within the existing BUTEX campus at 92 Shaheed Tajuddin Ahmed Avenue, Tejgaon Industrial Area, Dhaka. The building will have a total floor area of 12,980 sqm, ground coverage of 1,015 sqm, and will house laboratories, classrooms, a library, exam halls, offices, and a multipurpose hall, supporting BUTEX's mandate to produce skilled textile-sector professionals adept in emerging and green technologies. From an environmental perspective, the design incorporates several climate-responsive and low-carbon features, including low-E glazing, RCC fin shading systems on the south, east, and west facades, natural cross-ventilation via central corridors and stair cores, a rooftop solar panel/garden provision (approximately 210 sqm), and a heat/damp-protective roof coating. These features are expected to reduce operational energy demand and cooling loads relative to conventional institutional buildings. Potential adverse environmental impacts are site-specific, confined within the existing BUTEX campus premises, and are not expected in environmentally sensitive locations; the site is not within a declared Ecologically Critical Area

	(ECA), Protected Area, Sanctuary, or Forest. Construction will require demolition of existing low-rise campus structures (one 3-storied and two 1-storied buildings) and removal of only two trees. Anticipated construction-phase impacts include dust and particulate emissions, noise and vibration (of particular concern given the university's active teaching schedule), temporary drainage disruption and waterlogging risk given the site's basement level and Tejgaon's low-lying position relative to the Hatirjheel-Begunbari drainage system, traffic congestion along the campus's 18 m wide southern frontage road, construction waste generation, and standard occupational health and safety risks for workers. Given the in-campus nature of the works, community health and safety impacts beyond the immediate campus population (students, faculty, and staff) are not envisaged. The IEE prepared for this subproject, developed directly in line with ADB SPS 2009 and Bangladesh's Environment Conservation Rules (ECR) 2023, sets out site-specific impacts, mitigation measures, an Environmental Management Plan (EMP), a monitoring framework, and a three-tier Grievance Redress Mechanism (GRM). Based on the scale of works (a multi-storied academic building with laboratory space, exceeding 5,000 sqm built-up area), the subproject is anticipated to fall under the "Orange" category per ECR 2023, requiring Location Clearance and Environmental Clearance Certificates from the Department of Environment (DoE), and is categorized "B" under ADB SPS 2009, requiring preparation of a site-specific IEE. Initial risk assessment for Involuntary Resettlement: No involuntary resettlement impacts are envisaged. The EDC will be constructed entirely within existing BUTEX campus land already under institutional ownership; no additional land acquisition, physical displacement, or economic displacement is required. Social safeguards screening confirmed no resettlement impacts for this site. This subproject component is categorized "C" for involuntary resettlement under ADB SPS 2009. Initial risk assessment for Indigenous Peoples: No indigenous peoples/small ethnic community (SEC/IP) impacts are envisaged, as construction

	is confined to the existing BUTEX campus in urban Dhaka, with no ancestral domains, IP territories, or IP-owned resources present at or near the site. Programmatic benefits from the EDC (skills training, laboratory access, green technology curricula) are open to all BUTEX students on a non-discriminatory basis. This subproject component is categorized "C" for Indigenous Peoples, as no SEC/IP-specific beneficiary targeting or impact is associated with this particular site (distinct from other SICIP components located in the Chattogram Hill Tracts).
2. Likely programmatic risks	
This section identifies the factors that may impede successful program management and sustainability.	
Program management and sustainability - Are program activities likely to interact with other planned activities that may further increase adverse impacts? - Are there risk factors that may impede successful achievement of program outcomes overtime or whose outcomes are not known (disaster risk, climate change, social conflict/fragility) - Does the borrower have adequate trained staff and capacity to manage the E&S implementation of overall govt program (not just the ADB financed portion)? - Are there governance, corruption issues and political risks associated with the proposed sector or program? - Are there any other potential roadblocks to ensuring the environmental and social sustainability of the Program?	Initial risk assessment for Environment: Programmatic risks specific to the BUTEX EDC are not expected to be significant. Construction impacts are site-specific, temporary, and reversible through implementation of the EMP. The subproject does not interact meaningfully with other planned BUTEX campus developments in a way that would compound cumulative impacts, though general Tejgaon-area urban development (e.g., Dhaka Elevated Expressway works, Hatirjheel-Begunbari drainage projects) may contribute background construction traffic and dust during the same period. Climate risks — particularly intense monsoon rainfall and localized waterlogging given the site's basement and Tejgaon's drainage setting — have been considered in the building's site drainage and basement protection design. The Finance Division (MoF), acting as Executing Agency, has prior safeguards implementation experience through the SEIP-established SDCMU, though dedicated environmental/social safeguards staffing for this specific subproject site will need to be confirmed and strengthened during due diligence. Initial risk assessment for Involuntary Resettlement: No programmatic risks are expected. The EDC site is existing BUTEX-owned campus land with no competing claims or land-use conflicts. Initial risk assessment for Indigenous Peoples:

	No programmatic risks to SEC/IP communities are expected from this subproject site.
3. Likely institutional Risks	
This section describes the institutional complexity and capacity with regard to environment and social impact/risk assessment, planning, implementation and management.	
Institutional complexity and capacity - Describe borrowers organizational, administrative and regulatory structures related to environmental and social safeguards. - Whether borrower has the capacity to assess, plan and manage E&S safeguards/risks. - Whether the borrower has commitment and implementation experience with regard to assessment, planning and management of environment and social safeguards/risks. - Are there factors (for example complex institutional set up, involvement of multiple agencies at national, sub-national and local level agencies) that might impede borrower's capacity to effectively implement E&S safeguards/risks. - Are there other institutional barriers that might prevent the borrower from implementation of the RBL program. - Does the borrower have a system or proven track record of managing complaints related to E&S and others?	Initial risk assessment for Environment: Institutional risks are not expected to be significant. The Finance Division (MoF) is the Executing Agency, with SDCMU serving as the program management unit coordinating BUTEX EDC implementation alongside other SICIP components. A central Safeguards Unit under SDCMU — comprising an Environmental Specialist, Social and Resettlement Specialist, and construction supervision engineer — will oversee implementation of the EMP for this site, supported by the Construction Supervision Consultant (CSC) and reporting to the PIU safeguards focal person. Capacity-building for environmental focal persons specific to the BUTEX site's construction supervision will be confirmed during due diligence and detailed engineering design. Initial risk assessment for Involuntary Resettlement: No institutional risk is expected, as the EDC site requires no land acquisition and triggers no ADB SPS involuntary resettlement requirements. Initial risk assessment for Indigenous Peoples: No institutional risk to SEC/IP communities is associated with this subproject site.
4. Likely contextual risks	
This section refers to environment and social conditions in the program area that might influence the performance of the RBL program.	
E&S conditions in the program area - Is the program working in sensitive E&S settings that may intensify the likely impacts?	Initial risk assessment for Environment: The BUTEX campus is located in a highly urbanized, mixed industrial-institutional setting in Tejgaon, Dhaka, and is not within or near any environmentally sensitive area (ECA, Protected Area, Sanctuary, Forest) as

- Are there legacy issues or unresolved issues that might affect the commitment and the performance of the program? - Are there recent or ongoing social conflict or social fragility in the program area? - Are there factors that may cause ADB to be exposed to significant reputational risks? - Are there any known complaints by individuals or advocacy groups with regard to the components of the program or the performance of the EA/IA with regard to E&S implementation?	designated by the Government of Bangladesh. No legacy or unresolved environmental issues affecting this site have been identified; this will be confirmed during due diligence. Initial risk assessment for Involuntary Resettlement: Construction confined to existing campus land is not expected to fuel social conflict or community unrest, and no involuntary resettlement issues arise. Initial risk assessment for Indigenous Peoples: No ongoing or recent social conflict or fragility issues relevant to SEC/IP communities are associated with the BUTEX site.

5.	**Overall Assessment**	

This section describes the overall risk profile of the program. Environmental and social risks should be summarized separately.

- Overall environment risk assessment:

  Moderate. Potential environmental impacts are site-specific, temporary, and reversible, arising mainly from construction-phase dust, noise, traffic, and drainage/waterlogging management, with operational-phase risks related to waste, sanitation, and building energy/water performance. These are addressed through the site-specific IEE and its associated EMP, monitoring plan, and GRM. The subproject is categorized "B" under ADB SPS 2009 and anticipated to fall under the "Orange" category per ECR 2023.

  Overall involuntary resettlement risk assessment: Category "C." No involuntary resettlement impacts are associated with the BUTEX EDC, as construction is confined to existing campus land.

  Overall indigenous peoples risk assessment: Category "C." No indigenous peoples/SEC impacts, positive or negative, are specifically associated with this site.

  The program will ensure safeguards focal to ensure monitoring and coordination for safeguards monitoring and reporting as agreed with the EA.

6.	**Is the RBL suitable for proposed program?**	
	Yes ×	
	No	

7.	**Program Teams' Comments**

The overall safeguard risk for the BUTEX EDC is moderate: (i) construction activities carry a moderate likelihood of site-specific, reversible adverse environmental impacts manageable through the EMP; (ii) impacts are not located in environmentally or socially sensitive areas; (iii) no significant GHG or natural disaster risk is anticipated beyond standard urban construction carbon footprint, which is addressed through passive design and material-efficiency measures in the architectural design; (iv) the subproject is a single, well-defined, in-campus construction activity manageable with existing safeguards processes; (v) institutional, contextual, and programmatic risks are well understood and limited; (vi) the Finance Division has prior safeguards management experience through SEIP, though targeted

capacity strengthening for this site is recommended; and (vii) risk management measures (EMP, GRM, monitoring plan) are well-defined and readily implementable. The site-specific IEE, prepared directly under ADB SPS 2009 and ECR 2023 requirements, provides the impact assessment, mitigation measures, and EMP guiding environmental management for this subproject.	
8.	SDSS Comments

(see next page for guidance on risk rating)

Risk Rating

The descriptions below provide guidance on the risk rating for safeguards in RBL. The program team will provide an overall risk rating for the proposed RBL program. This approach provides an opportunity to the program team, borrower and relevant stakeholders to identify the potential risks and allocate adequate resources for elements that need in depth analysis and stronger risk management measures.

High	- There is a strong likelihood of program activities leading to significant adverse impacts on environment and affected people. - The significant adverse impacts, cumulative impacts and/or synergistic effects with other initiatives needs complex mitigation and management plans that are not readily available or unproven. - The program operation might have significant adverse impacts on emissions resulting from changes in the intensity or efficiency of emissions generation and controls. - There is large scale land acquisition, physical and economic displacement of APs. - There are significant adverse social impacts on gender, IPs, the poor and other vulnerable groups with potential to contribute directly to increased social fragility or conflict. - The program area has large geographical footprint with different implementation agencies/jurisdictions and varying implementation capacities. - The program design and institutional arrangements are complex. - The program needs direct management intervention to deal with programmatic, contextual and institutional risks which are diverse and complex. - Borrower may have the demonstrated capacity to manage E&S impacts but its performance is not consistent and some E&S risks are beyond its direct control and needs a dedicated capacity building measures. - There is a likelihood that program activities might lead to huge number of grievances - There are ongoing national or international advocacy and complaints in the program area with regard to the government program or the borrower/implementing agency.
Substantial	- There is still a strong likelihood of program activities leading to significant adverse impacts on environment and affected people. - The program operation might have adverse impacts on emissions resulting from changes in the intensity or efficiency of emissions generation and controls. - The significant adverse impacts are less severe and site specific and there are less chances of strong cumulative impacts - There is still large scale land acquisition, physical and economic displacement of APs - There is a potential for adverse social impacts on gender, IPs, the poor and other vulnerable groups and may contribute to existing social fragility or conflict - The program area has a smaller geographical footprint; institutional, contextual and programmatic risks are less complex and diverse - Risk management measures are more predictable and readily available. - Borrower may have the demonstrated capacity to manage E&S impacts, but its performance is not consistent and some E&S risks are beyond its direct control and still needs some dedicated capacity building measures. - The program is less subject to national or international advocacy and complaints, but poor performance may lead to large number of grievances
Moderate	- There is a moderate likelihood of program activities leading to some adverse impacts on environment and affected people. - The adverse impacts tend not to be in environmentally or socially sensitive areas - The program operation is unlikely to have significant adverse impacts on GHG and would not be at risk of natural disasters - Program activities are small scale, well known and manageable with existing processes/procedures. - There is limited likelihood of adverse social impacts on IPs, gender, the poor and other vulnerable groups.

	- The institutional, contextual and programmatic risks are well understood and limited in impact. - The borrower/implementing agencies have a proven track record in managing risks (not perfect) and limited capacity building/training measures are needed. - Risk management measures are more predictable and readily available.
Low	- There is low likelihood of program activities leading to any adverse impacts on environment and affected people. - The program operation is unlikely to have significant adverse impacts on GHG and would not be at risk of natural disasters - The borrower/implementing agencies have a proven track record in managing safeguard risks.

Appendix 4 – Sample Traffic Management Plan (TMP)

A. Principles

One of the prime objectives of the Contractor's **TMP** is to ensure the safety of all the road users along the work zone, and to address the following issues:

(i) the safety of pedestrians, bicyclists, and motorists travelling through the construction zone;
(ii) protection of work crews from hazards associated with moving traffic;
(iii) mitigation of the adverse impact on road capacity and delays to the road users;
(iv) maintenance of access to adjoining properties; and
(v) Addressing issues that may delay the project.

B. Operating Policies for TMP

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

1) Make traffic safety and temporary traffic control an integral and high-priority element of every project from planning through design, construction, and maintenance.
2) Inhibit traffic movement as little as possible.
3) Provide clear and positive guidance to drivers, bicyclists, and pedestrians as they approach and travel through the temporary traffic control zone.
4) Inspect traffic control elements routinely, both day and night, and make modifications when necessary.
5) Pay increased attention to roadside safety in the vicinity of temporary traffic control zones.
6) Train all persons that select, place, and maintain temporary traffic control devices.
7) Keep the public well informed.
8) Make appropriate accommodation for abutting property owners, residents, businesses, emergency services, railroads, commercial vehicles, and transit operations.

Figure A1 to Figure A6 illustrates the operating policy for TMP for the construction of water pipes and the sewers along various types of roads.

C. Analyze the Impact Due to Street Closure

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

a) Approval from the ULB/CMC/Public Works Department (PWD) to use the local streets as detours;
b) consultation with businesses, community members, traffic police, PWD, etc, regarding the mitigation measures necessary at the detours where the road is diverted during the construction;
c) Determining of the maximum number of days allowed for road closure, and incorporation of such provisions into the contract documents;
d) Determining if additional traffic control or temporary improvements are needed along the detour route;
e) Considering how access will be provided to the worksite;
f) Contacting emergency service, school officials, and transit authorities to determine if there are impacts to their operations; and
g) Developing a notification program to the public so that the closure is not a surprise. As part of this program, the public should be advised of alternate routes that commuters can take or will have to take as result of the traffic diversion.

If full road-closure of certain roads within the area is not possible, due to inadequate capacity of the detour arrangements, the full closure can be restricted to weekends with the construction commencing on Thursday night and ending on Sunday morning prior to the morning peak period. The traffic management guidelines are as follows:

- Review construction schedule and methods;
- Identify initial traffic recirculation and control policy;
- Identify routes for traffic diversions;
- Analyze adverse impact & mitigation at the detours;
- Begin community consultation for consensus;
- Finalize or determine alternate detours;
- Identify temporary parking (on and off -street);
- Discuss with CMC, owner, community for use;
- Coordinate with the Traffic Police to enforce traffic and diversions;
- Install traffic control devices (traffic cones, signs, lightings, etc);
- Conduct campaigns, publicity, and notify public about street closure; and
- Develop a mechanism to address public grievances regarding disruptors of traffic, utilities, etc.

D. Public Awareness and Notifications

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

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

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

a) Traffic control devices in place at the work zones (signs, traffic cones, barriers, etc.);
b) defensive driving behavior along the work zones; and
c) Reduced speeds enforced at the work zones and traffic diversions.

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

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

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

E. Install Traffic Control Devices at the Work Zones and Traffic Diversion Routes

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

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

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

The Contractor would need to consider such Traffic Management situations for these typical arrangements and others that may occur during road construction works. The Contractor would need to coordinate closely with the road management and road police authorities and submit their Traffic Management proposals, with not less than a month’s prior notice, to the PIU for obtaining prior approval, before any closure of roads are considered.

- Work on Shoulder or Parking Area;
- Work with Land Closure: Low Traffic;
- Work on Lane Closure With Yield Sign on Two Lane: Low Volume;
- Work on Lane Closure With Single Flag Operator on Two Lane : Low Volume;
- Lane Closure: Two Flag Operators on Two Lane Road; and
- Street Closure with Detour.

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

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

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

Appendix 5 – COVID-19 Health and Safety Guidance for the Construction Workforce

COVID-19 Health and Safety Guidance for the Construction Workforce

INSTRUCTIONS

Contractors are required to ensure health and safety of the workers and employees in accordance with environmental health and safety (EHS) provisions of the contract which is in line with ADB SPS 2009 and Bangladesh Labor Law 2006 (Chapter VIII). A supplementary EHS guidelines was prepared to ensure that workers and employees are safe from Pandemic COVID-19 infection while working at the constriction sites. This guideline should be used as a supplement to the project's Environmental Health and Safety (EHS) guidelines for the workers. Contractors are encouraged to prepare a site-specific Environmental Health and Safety (EHS) guidelines for reopening the sites and mobilizing labor and resources and get it approved by Executing Agency. The EHS guidelines and COVID-19 EHS guidelines should be available at worksite all the time with no exception.

Prerequisites for Reopening Worksite

1. Consider reopening at limited scale by identifying and engaging essential labor force
2. Avoid worker intensive works as much as possible; encourage use of equipment
3. Engage fulltime EHS professional to oversee the implementation of EHS guidelines
4. Engage a medical professional to prepare health record of the workers and daily health checkup
5. Ensure coverall Personal Protective Equipment (PPE) for medical professional
6. Prepare a list of equipment and vehicles to be used frequently and ensure routine disinfection
7. Make available thermometer, soap, hand sanitizer, disinfectant, and PPE (mask, gloves, boot) at worksite and camp
8. Place adequate number of washbasins, disinfectant tub, dispenser for sanitizer
9. Establish electronic payment system (e.g., BKash, Nagad, Rocket) to pay the daily wage
10. Follow the guidance as provided below.

Locate the closest medical facility equipped with COVID -19 and contact them.

Place washbasins and disinfectant tub for shoes.

Engage EHS professional. Engage Medical professional (fulltime/ part-time).

Place a few COVID-19 signed covered trash bin for disposal of used PPEs.

Supply soap and sanitizer to labor and staff for after office for disinfection.

Worksite Entrance Protocol

Everyone entering the worksite must wear a mask and gloves.

During worksite entry que, maintain physical distance of minimum 1m (3ft).

Every personnel should wash their hands with soap for 20 seconds. Display hand washing protocol at entrance.

Spray bottom of shoes of every personnel entering worksite/ campsite with disinfectant. Disinfect all vehicles entering site.

use thermometer gun to check temperature. If body temperature found > 37°C send to the designated medical facility.

Worksite Management

Frequently clean and disinfect highly used tools, machineries and surfaces (e.g. tables, toilets) by workers.

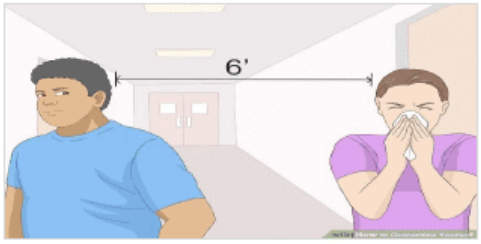
Mandatory morning briefing on COVID awareness at site maintaining physical distance.

Use alcohol-based wipe to clean tools, equipment, vehicle before and after use.

Discourage gathering at site. Discourage unnecessary entrance and exit at site.

Camp Management

1. Provide soap, sanitizer, washing facility and safe water at the workers' dwelling. Encourage frequent hand washing.
2. Ensure separate covered bin for disposal of used PPEs.
3. Protect against heat, cold, damp, noise, fire, and disease-carrying animals.
4. Maintain good housekeeping and social distancing in kitchens, meal rooms, canteens.
5. Ensure personal distance at least 1 meter (3 feet), preferably 2m (6ft) during lunch, dinner and prayer.
6. Ensure ample ventilation at the camp.



Place covered waste bins at worksite
Do not forget to dispose your used PPEs in the bins!!

Work at Site Awareness

Inform the designated ESH/Medical personnel immediately if any person starts showing the symptoms of COVID-19.

Encourage respiratory etiquette, including covering coughs and sneezes. Don't touch nose/eye/ mouth if not washed recently, do not spit.

Encourage the workers at camp to go out for supplies not more than once a week.

Shorten toolbox meetings. Initiate remote meeting protocol to avoid physical contact.

Stay informed. Get news from WHO and Government news outlets. Ask your EAs. Ask ADB.

Appendix 6 – Emergency response team

EMERGENCY/CRISIS RESPOSE TEAM
(Roles and Responsibilities)

A. Overview

An integrated approach to emergency response involves a range of stakeholders, including the primary responder (i.e. the contractor), supervision consultants, the secondary responder (i.e. EA/IAs) and the tertiary responder (i.e. Donor agencies (e.g. ADB)) along with the local authorities, regulatory agencies and the general public. Such a system therefore requires robust processes regarding information dissemination, training, and designation of responsibility, management actions, monitoring, control, and corrective actions. The Emergency/Crisis Response Team therefore needs to be fully equipped and well communicated.

B. Organization chart of crisis response team

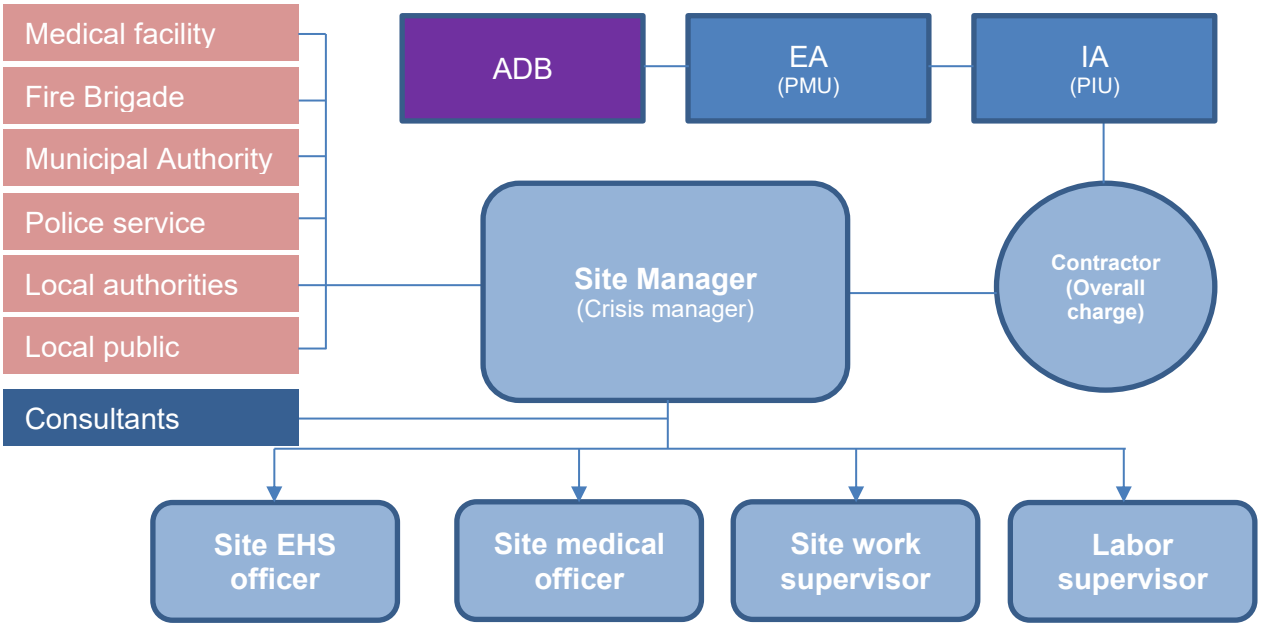


Figure: Organization chart of the crisis management team

Explanation of color code:

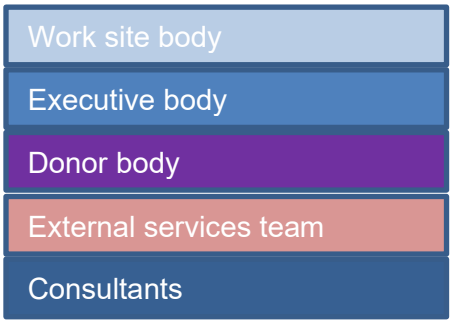


Table: Crisis response team

No.	Name	Designation	Mobile no.
1		Site Manager	
2		EHS officer	
3		Medical officer	
4		Worksite supervisor	
5		Labor supervisor	
6		Contractor	
7		Local hospital	
8		Local police station	
9		Local fire brigade	
..			

Appendix 7 – Sample EHS Monitoring and reporting template

Monitoring and Reporting Template

Environmental Health and Safety Monitoring

A. Environmental Health and Safety Checklist

Sl no.	Item	Exist in the worksite?		Recommendation And/ or Remarks	Time frame to comply
		Yes □	No □		
1	Site readiness (e.g. is worksite fenced and can be distinguished from general establishment? Is the an EHS professional at site? Has he/she been fulltime professional? Has he/she been present at site every day?)				
2	Site access (e.g., is site access road wide and easily accessible?)				
3	Signboard with safety warnings (e.g. with general EHS safety signboards, are COVID 19 response signboards visible at every corner of worksite?)				
4	Lighting (e.g. is every corner of the worksite is well lit?)				
5	Appropriate PPEs (Helmet, Safety Shoe, Vest, Ear plug, Musk etc.) e.g. Is every person in site is wearing appropriate PPEs?				
6	Fall protection measures (e.g. is the fall protection measures at worksite appropriate and adequate?				
7	Fire extinguishers (e.g. are they at site? How many? Are they placed at vulnerable/most accessible places?)				
8	House keeping (e.g. are all workers health records kept? Is the EMP and EHS manual at site? Has the morning briefing on EHS conducted? Is there any vehicle record/material register/attendance register/complain register kept?)				
9	Garbage bins (e.g. are there garbage bins at site? Are the numbers adequate? Is waste thrown to bins? Are the bins well places?				
10	Drinking water supply (e.g. safe drinking water for worksite been supplied? Is drinking water adequate?				
11	Sanitation facilities (e.g. is there separate male and female toilets established? Are they adequate? Hand wash materials and water being provided at toilets? Are those toilets sanitary?				
12	Dust protection measures (e.g. is mask provided for worksite personnel? Is water sprayed frequently as needed to suppress dust? Are sand class materials covered with plastic sheets?				
13	Noise barrier and reduction equipment (e.g. how much noise is generated by site? Does it exceed maximum human exposure limit? Are workers provided with noise reduction gears such as ear mufflers?)				
14	Shelter (e.g. is there a site office or shelter good enough to take shelter during rain or storm event?)				
15	First aid box (e.g. is there a first aid box at site? Are the contents of the first aid box adequate for primary treatment? Is the first aid box handled by at EHS/medical professional				

Sl no.	Item	Exist in the worksite?		Recommendation And/ or Remarks	Time frame to comply
		Yes □	No □		
16	Toolbox meetings (e.g. are toolbox meeting regularly arranged? Are records kept?)				
17	Others (many other checklists can be formulated by the EHS professional on board)				
COVID -19 protocols on top of usual EHS checklist (this applied to campsite also)					
18	COVID-19 posters/signboards (e.g. are COVID-19 awareness/protocol posters are showing all visible corners of the site?)				
19	Entrance protocol (e.g. Is the COVID-19 worksite entrance protocol been followed as stipulated in the COVID -19 response guidance? Are adequate soaps, water has been kept at site entry? Are workers at entrance que using mask, hand gloves and hard shoes? Are disinfectant spray kept at site entry to disinfect underneath the boots of entering persons?)				
20	Vehicle entry protocol (e.g. has the vehicle disinfection protocol has been initiated?)				
21	Social distancing (e.g. are the workers maintaining social distancing all the time?)				
22	Sharing tools/machineries (e.g. are the tools and machineries are wiped to disinfect before sharing/working?				
23	Disinfecting work area (e.g. is the worksite/ common surfaces, toilets etc. are disinfected before worksite opened in the morning? Has record being kept? Has the worksite been disinfected yesterday after closing for the day?)				
24	Restriction on worksite entry and exit (e.g. has workers being discouraged to travel frequently out of worksite or entering? Has records being kept?)				
25	Stock of disinfectant (e.g. is the stock of disinfectants, soap, PPEs are adequate at worksite?)				

*Attach photos

**Enter additional criteria as required for site specific measures

Reported by (ESC)	Checked by (TL)	Approved by (EA/IA)
Name Designation Signature Date	Name Designation Signature Date	Name Designation Signature Date
Received and agreed to comply by the representative of the contractor	**Name** **Designation** **Signature** **Date**	

B. Accident/ Incident Investigation Report

Class of Incident		Reported	
☐ Injure ☐ Property/ Plant Damage ☐ Near Miss ☐ Environmental		Yes ☐ No ☐ Details:	
		Further Action Required	
		☐ Report to Authorities ☐ Other	
Details of Incident			
Date of Incident		Time of Incident	am ☐ pm ☐
Witness Name		Witness Contact	
Nature of Incident			
Location of Incident			
Description of Incident			
Details of damage to equipment/property			
Injured Person/s (if applicable)			
Name			
Address			
Date of Birth			
Occupation		Employer	
Referred/transferred to			
Recommended Preventive Action			
Details			
Completed by			
Name		Position	
Signature		Date	

C. Safety patrol/inspection report form

SITE SAFETY PATROL REPORT AND INSTRUCTION						
Date						
Inspector						
No	**Location**	**Comment/instruction**	**Photo**	**Corrective action**	**Deadline**	**Responsible person**

Reported by (ESC)	**Checked by (TL)**	**Approved by (EA/IA)**
Name Designation Signature Date	Name Designation Signature Date	Name Designation Signature Date
Received and agreed to comply by the representative of the contractor	**Name** **Designation** **Signature** **Date**	

Appendix 8 – Sample Outline of Compensatory Tree Planting Plan

COMPENSATORY TREE PLANTING PLAN

Note: The purpose of the planting plan is to fully assess the existing tree resources on the development site and specify an implementable strategy for ensuring that the net medium-term effect of the site's development on local arboreal resources is at least neutral relative to existing conditions. The planting plan is to be developed by the design-build contractor and approved by the Forest Department and local Union Parishad authorities prior to issuance of the Site Clearance Certificate.

1. Plan Rationale and Requirements

- Objective of plan
- Brief description of planned development producing need for plan
- Forest Department requirements for compensatory planting plans
- Roles and responsibilities for plan development and implementation
- Required approvals

2. Baseline Profile of Tree Resources on the Development Site

A. General description of tree cover

- Proportion of site covered
- Historical trends of tree cover and surrounding areas
- Hydrological, soil and site use factors influencing distribution of tree cover on site
- Notable species assemblages
- Ecological functions of existing trees and groups of trees
- Micro-climatic functions of existing trees and groups of trees
- Existing uses of on-site trees
- Values associated with on-site trees by local people

B. Inventory of existing trees on site

- Full inventory of all trees over 2 m height, tabulated by species and size (height, crown width) and native/introduced status
- List of identified significant specimens (trees that are highly valued for any reason, e.g., religious or spiritual; very large size; serve as a social meeting place; historically high yield of fruits, nuts or other products; medicinal importance; use by popular wildlife)

3. Trees Designated for Preservation, Removal and Planting

A. Inventory of trees to be preserved, based on site master plan

- List of trees by species and location
- Map of preserved trees
- Planned method of protecting trees during site clearing and construction

B. Inventory of trees to be removed, based on site master plan

- List of trees by species and location
- Map of clearance areas
- Planned method of removing trees and disbursing timber

C. Inventory of spaces for compensatory planting

- Number of trees to be planted, based on anticipated removals
- List and description of suitable on-site areas, including soil and moisture constraints

- List and description of possibly suitable off-site areas, including soil, moisture and land use constraints
- Map of potentially suitable on-site and off-site planting areas

4. Report on Consultation with Local Stakeholders

A. Stakeholders
- List of institutional stakeholders
- List of existing users of trees on site
- List of residents in the vicinity of the site

B. Summary of consultation events and formats

C. Findings of consultations
- Non-monetary values attached to site trees by stakeholders
- Monetary values of existing tree uses
- Location preferences for compensatory planting
- Species preferences for compensatory planting

5. Compensatory Planting Plan

A. Constraints and opportunities
- Survey of suitable sapling sources (saplings at least 2 m tall, in sufficient number to have at least two trees planted for each tree removed)
- Estimation of sapling costs by species
- Seasonal factors affecting planting
- Minimum and optimal spacing requirements for different species

B. Selected species and locations
- Identification of priority species based on site conditions and consultation findings
- Identification of priority planting locations based on site conditions and consultation findings
- Master planting plan map

C. Planting strategy
- Timing of planting activity
- Procurement of saplings, soil amendments and mulches
- Procurement of labor for planting
- Stakeholder participation in planting

D. Plantation maintenance strategy
- Identification of maintenance needs by species and location (watering, mulching, fertilization, trimming, weeding)
- Maintenance schedule
- Arrangement of labor and responsibility for on-site plantation maintenance
- Arrangement of labor and responsibility for off-site plantation maintenance
- Procurement of tools for plantation maintenance

6. Cost Estimates
- Estimated initial costs for planting
- Estimated recurring costs for plantation maintenance

7. Monitoring of Implementation

- monitoring parameters (e.g., tree survival rate, maintenance performance)
- method and frequency of monitoring
- public participation in monitoring plantations
- definition of feasible corrective actions in the case of poor performance

Appendix 9 – Sample Outline of Contractor Environmental Management Plan

CONTRACTOR ENVIRONMENTAL MANAGEMENT PLAN (CEMP)

1. Purpose of the Plan
- Objectives
- Relationship to subproject/component EMP
- Relationship to specialized mitigation plans
- Performance indicators

2. Roles and Responsibilities in Plan Implementation
- Contractor's Environment, Health and Safety Representative
- Site engineers
- Emergency response focal persons
- Skilled workers
- Laborers

3. Legal Requirements
- Laws and regulations pertinent to the works
- Licenses and permits required

4. Special Contextual Issues
- Environmental (if any)
- Social (if any)
- Cultural (if any)

5. Scope of Works
- Description of infrastructure plan
- List of work locations and sites
- Applicable standards

6. Work Plan
- Resources (facilities, equipment, human resources)
- Coordination and phasing
- Timetable

7. Environmental Method Statements
- Boundary establishment and site clearing
- Soil protection and erosion prevention
- Runoff management
- Sediment control
- Dust prevention and suppression
- Noise and vibration impact management
- Storage of fuels, lubricants, coolants and other fluids
    - maintenance yard
    - construction sites
- Refueling and servicing equipment at the job site
- Monitoring of equipment condition
- Construction site safety management
- Materials stockpiles at the job site
- Chance Find Procedure for physical cultural resources

8. Waste Management

- Classes of waste produced by type of site
  - work sites
  - maintenance yards
  - construction camp
- Solid waste collection
  - collection methodology
  - collection frequency
  - responsibility for collection
- Solid waste recycling
  - recyclable materials
  - entities capable of accepting recyclable materials
  - recycling plan
- Solid waste disposal
  - composition of non-recyclable waste stream
  - legal and available disposal options in local area
  - disposal plan
- Waste oil and other hazardous wastes
  - types of hazardous liquids
  - methods of storage
  - collection methodology
  - collection frequency
  - legal and feasible treatment and disposal options
  - entities capable of accepting waste oil and other hazardous fluids and their containers
  - waste oil disposal plan

9. Emergency Response Plan

- Characterization of possible emergency situations for sites
  - spills and accidental releases
  - fires and explosions
  - serious accidents
  - other foreseeable situations
- Key actors (including names and contact information, to be updated regularly)
- Chain of command and process steps in emergency situations
- Documentation and reporting of incidents

10. Monitoring and Reporting Framework

- Purpose of monitoring
- Compliance monitoring parameters and methods
- Effects monitoring parameters and methods
- Responsibilities in monitoring
- Mechanism for corrective actions
- Monitoring schedule
- Reporting requirements

11. Training Needs and Plans

- Training needs assessment
- Training targets and content
- Training plan

Appendix 10 – Outline of Soil Erosion Prevention Plan

SOIL EROSION PREVENTION PLAN

1. Plan Rationale and Requirements

- Objective of plan
- Description of work sites and earthworks
- Roles and responsibilities for plan development, approval, implementation and supervision

2. Identification of Erosion Risks Specific to Site and Materials

- Erodibility of natural site soils
- Erodibility of fill materials
- Erodibility of stockpiled building materials
- Erosion by rainfall
- Erosion by running water (site runoff, flash floods, fluvial flooding)
- Erosion by wind
- Types of erosion (e.g., sheet, rill, gully, mass)

3. Method Statements

- Timing of earthworks to limit erosion risk (seasonal and weather-related)
- Mulching
- Temporary ground covers (e.g., jute mats)
- Permanent slope protection measures (e.g., terracing, geocells)
- Temporary drainage arrangements to avoid concentration of flow
- Check dams and sediment traps
- Temporary armored runoff channels
- Runoff infiltration swales
- Stockpile covers (tarpaulins)
- Stockpile containment dams

4. Monitoring and Correction

- Method of site monitoring for active erosion and erosion risk
- Frequency of site monitoring for active erosion and erosion risk
- Practices for correcting different types of erosion

Follow-up to corrective actions

Appendix 11 – Sample Outline of Construction Camp Management Plan

CONSTRUCTION CAMP MANAGEMENT PLAN

1. Purpose of the Plan
- Objectives
- Relationship to subproject EMP
- Performance indicators

2. Environmental and Social Context of Construction Camp
- Location
- Road access and distance to road sites
- Service infrastructure
- Local topography
- Prevailing wind
- Drainage
- Nearby water bodies
- Surrounding land use
- Local communities
    - proximity
    - population
    - ethnic makeup
    - employment and livelihoods

3. Camp Capacity and Resident Profile
- Projected number of resident workers during different phases of work
- Expected number of accompanying family members
- Expected number of support staff living on site
- Expected ethnic makeup of camp residents

4. Camp Infrastructure
- Kitchens
- Eating facilities
- Toilets and septic system(s)
- Wash-up facilities
- Accommodations
- Storage
- Water supply and water heating
- Electricity
- Cooking fuel
- Backup generators
- Firefighting equipment
- Parking
- Fencing
- Site layout
- Camp construction schedule

5. Cleaning and Maintenance Plan

- Cleaning and sanitation
  - responsibilities
  - methods
  - schedule
- Facility inspection and maintenance
  - responsibilities
  - inspection methodology
  - inspection schedule
  - maintenance schedule

6. Wastes and Waste Management

- Solid waste
  - expected composition of solid waste stream
  - collection and management of recyclables
  - collection and management of non-recyclables
  - collection and composting of organic waste
- Liquid waste
  - expected composition of liquid waste stream
  - management of gray water
  - management of sewage

7. Rules Governing Resident Behavior

- Rules for conduct when in camp
- Rules for conduct outside camp
- Family members policy
- Visitor policy
- Rules regarding alcohol and illegal drugs
- Procedure for adjudicating disputes among residents

8. Training

- good practices for disease prevention
- camp safety and fire suppression

9. Monitoring and Reporting

- Purpose of monitoring
- Monitoring responsibilities
- Monitoring methodology
- Monitoring frequency
- Reporting schedule

10. Camp decommissioning

- Responsibility for decommissioning
- Procedure for decommissioning
- Timing of decommissioning

Appendix 12 – Sample Outline of Site Reinstatement Plan

SITE REINSTATEMENT PLAN

1. Plan Rationale and Requirements

- Objective of plan
- Description of work sites and earthworks
- Roles and responsibilities for plan development, approval, implementation and supervision

2. Schedule of works

- Construction schedule by building and area
- 'Reinstatement-ready' schedule by site area
- Seasonal constraints on vegetation establishment
- Reinstatement and planting schedule by site area
- Post-planting monitoring and maintenance schedule (through end of defects period)

3. Vegetation specifications

- New tree plantings indicated in detailed design (landscaping plan)
- number
- preferred species
- planting locations
- New tree plantings required under Compensatory Tree Planting Plan
- number
- preferred species
- planting locations
- Ground cover specified for infiltration areas
- total planting area
- locations of infiltration areas
- preferred species
- Ground cover specified for recreational use areas
- total planting area
- locations of recreational use areas
- preferred species
- Ground cover specified for ornamental displays
- total planting area
- locations of ornamental displays
- preferred species

4. Sourcing of key materials

- Saplings
- Root stock
- Seed
- Soil amendments
- Mulches and other protective materials (e.g., jute mats)

5. Method statements

- Removal, storage and replacement of topsoil
- Slopes (maximum slope and stabilizing measures)
- Pre-planting soil suitability assessment and soil amendment
- Tree planting
- Bare root planting

- Seeding
- Use of mulches and other protective materials
- Watering (by vegetation type)
- Fertilization (by vegetation type)
- Weeding, thinning and trimming (by vegetation type)

6. Monitoring and Follow-up

- Metrics and methods for measurement of vegetation establishment success (e.g., vigor, survival rate by time period, density, coverage)
- Frequency of site monitoring
- Documentation and reporting of vegetation monitoring results
- Criteria for replanting and infill planting

Appendix 13 – Sample Outline of Occupational Health and Safety Plan

OCCUPATIONAL HEALTH AND SAFETY PLAN

1. Plan Rationale and Requirements

- Objective of plan
- Description of work sites and major work activities
- Roles and responsibilities for plan development, approval, implementation and supervision

2. Identification of Health and Safety Risks Specific to Site and Activities

- Inventory of hazards inherent to work site
- Inventory of dangerous activities
- Inventory of hazardous materials used and stored on site
- Inventory of health risks for workers

3. Method Statements for Risk Reduction Practices

- Task-appropriate PPE and its proper use
- Operating heavy machinery
- Working in proximity to mobile heavy machinery
- Working at height
- Working in trenches and holes
- Working in underground enclosed spaces
- Electrical work
- Handling hazardous materials
- Handling and storing explosive and flammable materials
- Use of cranes
- Lifting
- Arc welding
- Power cutting and grinding
- Dust suppression
- Spill prevention and response
- Fire suppression
- Personal hygiene on the work site

4. Work Site Setup and Maintenance Specifications

- Provision and placement of fire suppression equipment
- Provision and placement of spill containment and cleanup supplies
- Safe storage spaces for hazardous, flammable and explosive materials
- Barriers and fencing
- Provision of adequate toilets based on worker population
- Provision of adequate wash-up facilities based on worker population
- Provision of unlimited drinking water meeting national standard for drinking water
- Provision of shaded break areas
- Food preparation and eating facilities

5. COVID-19 Containment and Prevention

- Practices as specified in ADB and GOB's Technical Guidance for Social and Institutional Containment and Prevention

6. Emergency Response Plan

- Designation of focal persons and 24/7 contact details

- Definition of chain of command
- Flowchart of response actions
- Identification, placement, labeling and upkeep of emergency response equipment
- Materials for use in training
- Emergency drill procedure and schedule

7. Training

- Induction training (content and timing)
- Refresher training (content and timing)
- Health and safety meetings
- Specialized tasks training (e.g., for heavy equipment operators and at-height workers)
- Emergency response training

8. Monitoring

- Site health and safety audits (methods, parameters, frequency, documentation)
- Spot check system
- Framework for follow-up and corrective action

Appendix 14 – Sample Outline of Asbestos-Containing Materials Removal and Disposal Plan

ASBESTOS-CONTAINING MATERIALS (ACM) REMOVAL AND DISPOSAL PLAN

1. Plan Rationale and Requirements

- Objective of plan
- Description of demolition needs at site and reasons for suspecting presence of ACMs
- Bangladesh National Building Code specifications for ACM handling
- Roles and responsibilities for plan development, approval, implementation and supervision

2. Assessment of ACM Presence

- Inventory of suspected ACMs by structure
- Inventory of suspected ACMs by material type
- Engagement of accredited testing firm for sampling and analysis
- Estimated volume of non-friable ACMs
- Estimated volume of friable ACMs

3. ACM Removal Methodology

- Risk-reduction training for workers involved in removal and handling
- PPE provision (P100 respirators, full hazmat suits including hoods)
- Exclusion of non-essential workers from removal site
- Wetting and constant misting system for removal site
- Complete containment system for transportation
- Low-breakage removal and handling methods
- Temporary on-site containment and storage methods
- Post-removal inspection method

4. ACM Disposal Option Selection

- Assessment of on-site deep burial options (including identification of locations likely never to be disturbed by people or natural processes, either during construction or afterwards)
- Survey of locally available and legally sanctioned off-site disposal options (e.g., landfill equipped and accredited for ACM disposal)
- Rationale for chosen disposal solution

5. ACM Transport and Disposal Methodology

- Risk-reduction training for workers involved in handling and transport
- Complete containment system for transportation
- Deep burial specifications (on-site disposal)
- Low-breakage placement methods (on-site disposal)
- Misting system for disposal site (on-site disposal)

Appendix 15 – Sample Outline of Spill Prevention and Response Plan

SPILL PREVENTION AND RESPONSE PLAN

1. Plan Rationale and Requirements

- Objective of plan
- Description of storage spaces and transshipment activity
- Roles and responsibilities for plan development, approval, implementation and supervision

2. Characterization of Hazardous and Noxious Cargo Risks

- Fuels
- Oils
- Bagged chemical substances
- Containerized dry chemicals
- Containerized liquid chemicals
- Bulk dry chemicals
- Bulk liquid chemicals
- Flammable materials
- Explosive materials
- Non-compatibility between classes of substances

3. Scoping of Spill Scenarios

- Truck rollovers and collisions on site
- Leaks from cargo on trucks
- Leaks from stored materials (in warehouses)
- Leaks from stored materials (outside)
- Spills during transshipment handling
- Explosions
- Fires
- Penetration of storage arrangements by flash flood

3. Method Statements for Spill Prevention

- System for identification of potentially hazardous and noxious incoming cargos
- Characterization of spill risk at time of entry
- Hazardous and noxious cargos registry
- Safe handling and transfer procedures (for each class of hazardous and noxious materials)
- Safe indoor storage requirements (for each class of material, taking account of non-compatibilities)
- Raised platforms for outdoor storage
- Temporary canopies for outdoor storage
- Collision and rollover prevention

4. Spill Response and Cleanup Plan

- Designation of point persons for response, including 24/7 contact details
- Definition of chain of command for response
- Flowchart of spill response actions
- Method statement: containment
- Method statement: cleanup
- Method statement: treatment and disposal
- Placement and upkeep of spill response and cleanup equipment and supplies
- Materials for use in training

- Notification protocols (people on site, authorities and public)
- Protocol for when to seek guidance from DOE or other agencies

5. Training

- Training for spill response leaders (content, frequency, outside expertise needed)
- Training for other site personnel (content, frequency)
- Training for laborers involved in transshipment activity (content, frequency)

Appendix 16 – Consultation Records

SICIP – BUTEX

FGD – 02

Place: Begumbari, Rood.
Date: June, 26 (8-06-26)

Sl.	Name	Designation	Cell / Signature
01.	Akbar	Tea shop.	0185 284111
02.	Askar	Rickshaw puller	01810 263342
03.	Md. Mashrur Rahim	Local Shop owner	0171 6260777
04.	Maruf.	Daily labor	01816 200244
05.	Md. Muzzem Hossain	Imam, DP mosque	01813 264111
06.	Lal Mia.	Daily labor	—
07.	Foysal Mia	Daily labor	01917263521
08.	Mukter Mia	Daily labor	—

SICIP – BUTEX

FGD -01

: place – Executive Engineer's office
: date – January 26, 26

Sl.	Name	Designation	Signature and Cell
01.	Prof. Dr. Ahsan Habib.	Professor, TMBS	
02.	Md. Afzal Hossain	Chief. Engineer	Afzal. 01734-308423
03.	Md. Ramjan Ali Talukdar	Ast. Engineer	Ramjan. 01671-481481
04.	Farzana Akter	Student	Farzana. 01917-320160
05.	Nargis Akter	Student	Nargis 01973-264521
06.	Sadat Ali Khan	Student	Sadat
07.	Sk. Mashrur Tyeem	Student	Mashrur 01753-280261
08.	Arun kanti Sarkar.	Student	Arun

Appendix 17 – Proposed Terms of Reference for Environment, Health and Safety Officers

The Environment, Health and Safety Officers (EHSOs) are critical to the timely and effective implementation of the EMP/EMoP, as they will be responsible for executing all compliance activities pertaining to the works and operations of the EA. The EHSOs will answer the Environmental Safeguards Focal Person (ESFP). The responsibilities of each EHSO are as follows:

(i) Prepare site-specific monitoring checklists for assigned investment sites under the control of the EA, based on the contents of the EMP/EMoP, to assess site-level compliance with prescribed mitigation measures and effectiveness in meeting relevant national standards for key environmental parameters;

(ii) Conduct compliance and effects monitoring on at least a monthly basis (including both regular inspections and spot checks) at all assigned investment sites under the control of the EA, and compile monitoring results in quarterly monitoring reports to the EA's ESFP;

(iii) Support and collaborate with any outside entities contracted to conduct sampling, testing and analysis of environmental parameters, as identified in the EMP/EMoP, and incorporate their results into quarterly monitoring reports;

(iv) Engage directly with site engineers to propose and ensure effective implementation of corrective actions needed to address emerging and recurrent problems, including both compliance issues and environmental effects that violate relevant national standards;

(v) Design and orchestrate training for workers and site engineers as may be needed to forestall, correct or lessen emerging and recurrent problems with compliance and deleterious environmental effects derived from site activity;

(vi) Facilitate and participate in any site visits conducted by officials of DOE, DIFE or other relevant regulatory agencies;

(vii) Assist the ESFP with preparation of the EA's environmental reporting, including but not limited to its submissions to the PIU and/or SOU; and

(viii) Prepare a Notification of Environmental Harm for immediate submission to DOE in the event of any serious release or other deleterious event occurring on any site under the EA's control, ensure rapid appropriate action by the Contractor, and coordinate follow-up with DOE as needed.

Appendix 18 – Outline of Semi-Annual Environmental Monitoring Report

The Program Steering Committee is required to submit semi-annual environmental monitoring reports to ADB, for review and public disclosure on the ADB website. The semi-annual reports will be produced by the Safeguards Oversight Unit. A sample report outline, which can be adapted as necessary, is provided below.

1. Introduction
- Report purpose
- Overview of subproject components and sites subject to monitoring
- Summary of project implementation progress

2. Review and Verification of Clearance History
- Clearances required and obtained
- Clearances due for renewal in upcoming monitoring period
- Clearance lapses and plans for reinstatement

3. Review of Contractor Environmental Monitoring Reports (CEMRs)
- Reports submitted/outstanding
- Quality of reports received and comments issued
- Issues of note from CEMRs, and contractor follow-up

4. Summary of Works and Prescribed Mitigation
- Major work activities by site
- Mitigation measures prescribed
- Ongoing corrective actions from previous monitoring period

5. Summary of Monitoring Activity
- number and dates of site visits
- monitoring methodology used

6. Monitoring Results
- instances of non-compliance
- violations of standards and observed negative environmental effects
- on-site communication with contractor personnel
- photographs

7. Corrective Action Required
- description and explanation of non-compliance or concerns noted
- required actions with timeframe and responsibility
- corrective actions undertaken in the current period
- corrective actions to continue into the next period

8. Attachments
- Notices of Non-Compliance issued
- Additional photographs

Appendix 19 – Sample Grievance Registration form

(Bangla translation to be available)
The **SICIP** welcomes complaints, suggestions, queries and comments regarding project implementation. We encourage persons with grievance to provide their name and contact information to enable us to get in touch with you for clarification and feedback.

Should you choose to include your personal details but want the information to remain confidential, please inform us by writing/typing *(**CONFIDENTIAL**)* above your name.

Date	**Place of Registration**				
Contact Information/Personal Details					
Name		**Gender**	* Male * Female	**Age**	
Home Address					
Place					
Phone no.					
E-mail					
Complaint/Suggestion/Comment/Question Please provide the details (who, what, where, and how) of your grievance below: If included as attachment/note/letter, please tick here:					
How do you want us to reach you for feedback or update on your comment/grievance?					

FOR OFFICIAL USE ONLY

Registered by: (Name of Official Registering Grievance)	
Mode of Communication: Note/Letter E-mail Verbal/Telephonic	
Reviewed by: (Names/Positions of Officials Reviewing Grievance)	
Action Taken:	
Whether Action Taken Disclosed:	Yes No
Means of Disclosure:	

Appendix 20 – Outline of chance finds protocols

Scope of the chance find procedure

This procedure is applicable to all activities conducted by the personnel, including contractors, that have the potential to uncover a heritage item/site. The procedure details the actions to be taken when a previously unidentified and potential heritage item/site is found during construction activities. Procedure outlines the roles and responsibilities and the response times required from both project staff, and any relevant heritage authority.

Induction/Training

All personnel, especially those working on earth movements and excavations, are to be inducted on the identification of potential heritage items/sites and the relevant actions for them with regards to this procedure during the Project induction and regular toolbox talks.

Chance find procedure

If any person discovers a physical cultural resource, such as (but not limited to) archaeological sites, historical sites, remains and objects, or a cemetery and/or individual graves during excavation or construction, the following steps shall be taken:

1. Stop all works in the vicinity of the find, until a solution is found for the preservation of these artefacts, or advice from the relevant authorities is obtained;
2. Immediately notify a foreman. The foreman will then notify the Construction Manager and the Environment Officer (EO)/Environmental Manager (EM);
3. Record details in Incident Report and take photos of the find;
4. Delineate the discovered site or area; secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities take over;
5. Preliminary evaluation of the findings by archaeologists. The archaeologist must make a rapid assessment of the site or find to determine its importance. Based on this assessment the appropriate strategy can be implemented. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage such as aesthetic, historic, scientific or research, social and economic values of the find;
6. Sites of minor significance (such as isolated or unclear features, and isolated finds) should be recorded immediately by the archaeologist, thus causing a minimum disruption to the work schedule of the Contractor. The results of all archaeological work must be reported to the Ministry/Agency, once completed.
7. In case of significant find the Agency/Ministry should be informed immediately and in writing within 7 days from the find;
8. The onsite archaeologist provides the Heritage team with photos and other information as relevant for identification and assessment of the significance of heritage items.
9. The Ministry must investigate the fact within 2 weeks from the date of notification and provide response in writing.
10. Decisions on how to handle the finding shall be taken by the responsible authorities. This could include changes in the layout (such as when finding an irremovable remain of cultural or archaeological importance) conservation, preservation, restoration and salvage;
11. Construction works could resume only after permission is granted from the responsible authorities.

12. In case no response received within the 2 weeks period mentioned above, this is considered as authorization to proceed with suspended construction works.

One of the main requirements of the procedure is record keeping. All finds must be registered. Photolog, copies of communication with decision making authorities, conclusions and recommendations/guidance, implementation reports kept.

Appendix 21 – GBV/SEA-SH Action Plan for the BUTEX EDC Subproject

1. Purpose and Rationale

This GBV/SEA-SH Action Plan sets out the measures the BUTEX EDC subproject will implement to prevent, mitigate, and respond to risks of gender-based violence (GBV) and sexual exploitation, abuse, and sexual harassment (SEA/SH) arising from construction and operation activities. The plan responds to the risk identified in this IEE: the influx of a predominantly male construction workforce into an active university campus with a substantial resident and daily female student, faculty, and staff population, combined with underreporting patterns documented in Bangladeshi tertiary institutions.

2. Risk Rating

The BUTEX EDC subproject is assessed as having a moderate GBV/SEA-SH risk, given: (i) construction is confined to a defined, fenced site within an active campus rather than a remote or unsupervised location; (ii) the workforce size is expected to be limited to a single mid-rise building project rather than a large labor camp; and (iii) BUTEX already has some institutional framework (e.g., an existing sexual harassment complaint mechanism) that can be leveraged and strengthened, rather than built from scratch.

3. Action Plan Matrix

S/N	Action	Activities	Timing	Responsible Party	Indicator
1	Integrate SEA/SH requirements into bidding and contract documents	Include SEA/SH clauses, Code of Conduct (CoC) requirements, and non-compliance penalties in bidding documents and civil works contract	Prior to contract award	PIU/SDCMU Safeguards Unit	SEA/SH clauses included in bid documents (Y/N)
2	Designate a GBV/SEA-SH Focal Person	Appoint a dedicated (preferably female) focal person at BUTEX/PIU level to oversee SEA/SH matters for this site	Prior to mobilization	PIU Safeguards Unit, BUTEX Administration	Focal person appointed and contact details publicized (Y/N)
3	Worker sensitization and Code of Conduct	All contractor/subcontractor workers and supervisors sign CoC and attend SEA/SH induction training before starting work; refresher training every 6 months	Prior to mobilization; ongoing	Contractor, CSC	% of workforce trained and CoC signed (target: 100%)
4	Site-level physical safeguards	Install continuous site hoarding/fencing, controlled access points, adequate perimeter and pathway lighting; separate, lockable sanitation facilities for male and female workers	Prior to and during construction	Contractor	Site inspection checklist confirms compliance (monthly)
5	Strengthen the Grievance Redress Mechanism (GRM) for SEA/SH	Establish a confidential SEA/SH-specific reporting channel (complaint box, hotline, focal person) distinct from general construction grievances, with clear referral pathway to medical, psychosocial, and legal support	Prior to mobilization	PIU Safeguards Unit, CSC	Functional SEA/SH GRM channel established and publicized (Y/N)
6	Coordinate with BUTEX's existing complaint committee	Brief BUTEX's existing sexual harassment complaint committee on the project GRM to avoid parallel/conflicting reporting	Prior to mobilization	PIU Safeguards Unit, BUTEX Administration	Coordination meeting held and referral protocol

S/N	Action	Activities	Timing	Responsible Party	Indicator
		structures; formalize referral linkage			documented (Y/N)
7	Map local GBV service providers	Identify and list nearby medical, psychosocial, and legal service providers (e.g., hospital, One-Stop Crisis Center, legal aid) for survivor referral	Prior to mobilization	PIU Safeguards Unit	Service provider directory completed and shared with focal persons (Y/N)
8	Screening of workforce	Contractor to confirm no workers with documented prior SEA/SH offenses are hired for this site	Prior to mobilization; ongoing	Contractor, CSC	Zero confirmed breaches (target: 0)
9	Monitoring and reporting	Monthly site inspection and GRM log review; immediate ad hoc response to any reported incident; quarterly reporting to PIU/ADB	Throughout construction	CSC, PIU Safeguards Unit	Number of complaints logged, resolved, and response time; quarterly report submitted (Y/N)
10	Post-construction review	Conduct a close-out review of SEA/SH incidents, lessons learned, and handover of any residual referral responsibilities to BUTEX	End of construction	PIU Safeguards Unit, BUTEX Administration	Close-out review report completed (Y/N)

4. Accountability and Response Framework

Any SEA/SH allegation will be handled with strict confidentiality and survivor-centered principles: (i) reports may be made to the site-level focal person, the CSC, or directly to the PIU Safeguards Unit through the dedicated SEA/SH GRM channel; (ii) the focal person will document the complaint (without recording identifying survivor details in general logs) and initiate an immediate safety/risk assessment; (iii) survivors will be referred promptly to mapped medical, psychosocial, and legal services based on their choice and consent; (iv) corrective action against the alleged perpetrator (e.g., removal from site, contract termination) will be taken by the Contractor under PIU/CSC supervision, consistent with the CoC; and (v) no survivor will be required to confront the alleged perpetrator or disclose details beyond what is necessary for response and resolution.

5. Budget

An indicative budget of BDT 150,000–250,000 is allocated for this Action Plan's implementation over the construction period, covering training sessions, GRM operation, focal person honorarium, service provider mapping, and periodic audits, consistent with the monitoring cost estimate presented elsewhere in this IEE's monitoring table.

Appendix 22 – SOP for Managing Chemicals and Hazardous Materials in BUTEX EDC Laboratories

1. Purpose and Scope

This Standard Operating Procedure (SOP) establishes safe practices for the acquisition, storage, handling, use, and disposal of chemicals and hazardous materials used in the BUTEX EDC's textile testing, dyeing, printing, finishing, and analytical laboratories (1st and 2nd floor Wet Processing Engineering, Pretreatment and Dyeing, Printing, Finishing, and Analytical/Central Research Labs). It applies to all faculty, researchers, students, and support staff who acquire, handle, store, or dispose of laboratory chemicals within the EDC building.

2. Roles and Responsibilities

- Lab In-Charge/Faculty Supervisor: Overall responsibility for SOP compliance within each lab; maintains chemical inventory and Safety Data Sheets (SDS); authorizes chemical procurement.
- Lab Technicians/Staff: Day-to-day implementation of storage, handling, and disposal procedures; conduct routine inspections.
- Students/Researchers: Follow SOP and lab-specific safety instructions under supervision; report spills/incidents immediately.
- BUTEX EHS/Safety Focal Person: Coordinates hazardous waste collection, disposal contracts, training, and incident reporting to the PIU/DoE as required.

3. Chemical Acquisition and Inventory

- All chemicals must be procured through the lab in-charge with an accompanying SDS obtained before receipt.
- Maintain an up-to-date chemical inventory log (name, quantity, hazard class, date received, expiry date, storage location) for each laboratory.
- Purchase only the quantity needed for planned experiments/coursework to minimize on-site storage volume and waste generation.
- Newly received chemicals must be labeled with receipt date and inspected for container integrity before storage.

4. Storage Requirements

- Store all chemicals in their original, correctly labeled containers, capped and in an upright position.
- Segregate chemicals by hazard class and compatibility (e.g., acids separate from bases; oxidizers separate from flammables/organics); use secondary containment (chemical-resistant trays/bins) to separate incompatible chemicals stored in the same cabinet.
- Store flammable solvents (e.g., dyeing/finishing chemicals) in a dedicated, ventilated flammables cabinet away from ignition sources and heat.
- Store acids and corrosives in acid-resistant cabinets near floor level, never above eye level.
- Store temperature-sensitive reagents in a refrigerator/deep freezer as specified on the SDS; do not use lab refrigerators for food storage.
- Keep chemical storage areas well-ventilated, cool, and locked/access-restricted to trained personnel only.

5. Safe Handling Practices

- All personnel must complete lab-specific chemical safety training and review the relevant SDS before handling any hazardous chemical.

- Use fume hoods/local exhaust ventilation for volatile or hazardous chemical operations (e.g., dyeing, finishing chemical preparation).
- Wear appropriate PPE at all times when handling chemicals: lab coat, safety goggles/face shield, chemical-resistant gloves, and closed-toe shoes.
- Never mix chemicals without confirmed compatibility knowledge; assume unknown mixtures are hazardous.
- Do not leave chemical containers unattended or open when not in active use.
- Transport chemicals within the building using a lab cart or designated carrying container, never by hand-carrying open containers through corridors or stairwells.

6. Spill and Emergency Response

- Each lab must have a spill kit appropriate to the chemicals in use (absorbent material, neutralizing agents, PPE, disposal bags) positioned near the storage/work area.
- For minor spills (<100 mL, non-acutely hazardous): contain and clean up immediately using the spill kit, following SDS-specific decontamination instructions; dispose of contaminated materials as hazardous waste.
- For major spills (>100 mL) or any spill of an acutely hazardous substance: evacuate the area, close doors, alert the Lab In-Charge and BUTEX EHS Focal Person immediately, and do not attempt cleanup without proper training and equipment.
- Post emergency contact numbers (Lab In-Charge, BUTEX EHS Focal Person, campus security/fire services) prominently in each laboratory.
- All spills and incidents must be logged and reported to the BUTEX EHS Focal Person within 24 hours.

7. Hazardous Waste Management and Disposal

- Segregate chemical waste by hazard class at the point of generation; never mix incompatible waste streams (e.g., acids with cyanides, oxidizers with organics).
- Use only compatible, labeled waste containers, kept closed except when adding waste, with no more than 90% fill capacity to allow for expansion.
- Label all waste containers with contents, hazard class, and accumulation start date.
- Store accumulated hazardous waste in a designated Satellite Accumulation Area (SAA) within or adjacent to each lab, with secondary containment to capture leaks/spills.
- Dispose of accumulated hazardous waste within 90 days of generation through a licensed hazardous waste contractor; do not pour chemical waste down drains or dispose of it with general solid waste.
- Maintain a hazardous waste log (type, quantity generated, disposal date, contractor/manifest reference) for each laboratory, consolidated centrally by the BUTEX EHS Focal Person for reporting purposes.
- E-waste and battery/lamp waste from lab equipment must be managed separately under the Hazardous Waste (E-waste) Management Rules, 2021, consistent with the broader building-wide e-waste provisions described elsewhere in this IEE.

8. Training and Recordkeeping

- All lab personnel (faculty, staff, students) must undergo chemical safety induction training before first laboratory access, with annual refreshers.
- Maintain training attendance records, chemical inventory logs, waste disposal manifests, and incident/spill reports for a minimum of 3 years, available for CSC/PIU/DoE inspection.

9. Monitoring and Compliance

- The BUTEX EHS Focal Person will conduct quarterly inspections of all EDC laboratories to verify SOP compliance (storage segregation, labeling, PPE availability, waste accumulation status).
- Non-compliance findings will be documented and corrective actions tracked to closure, with escalation to the PIU Safeguards Unit if unresolved within 30 days.